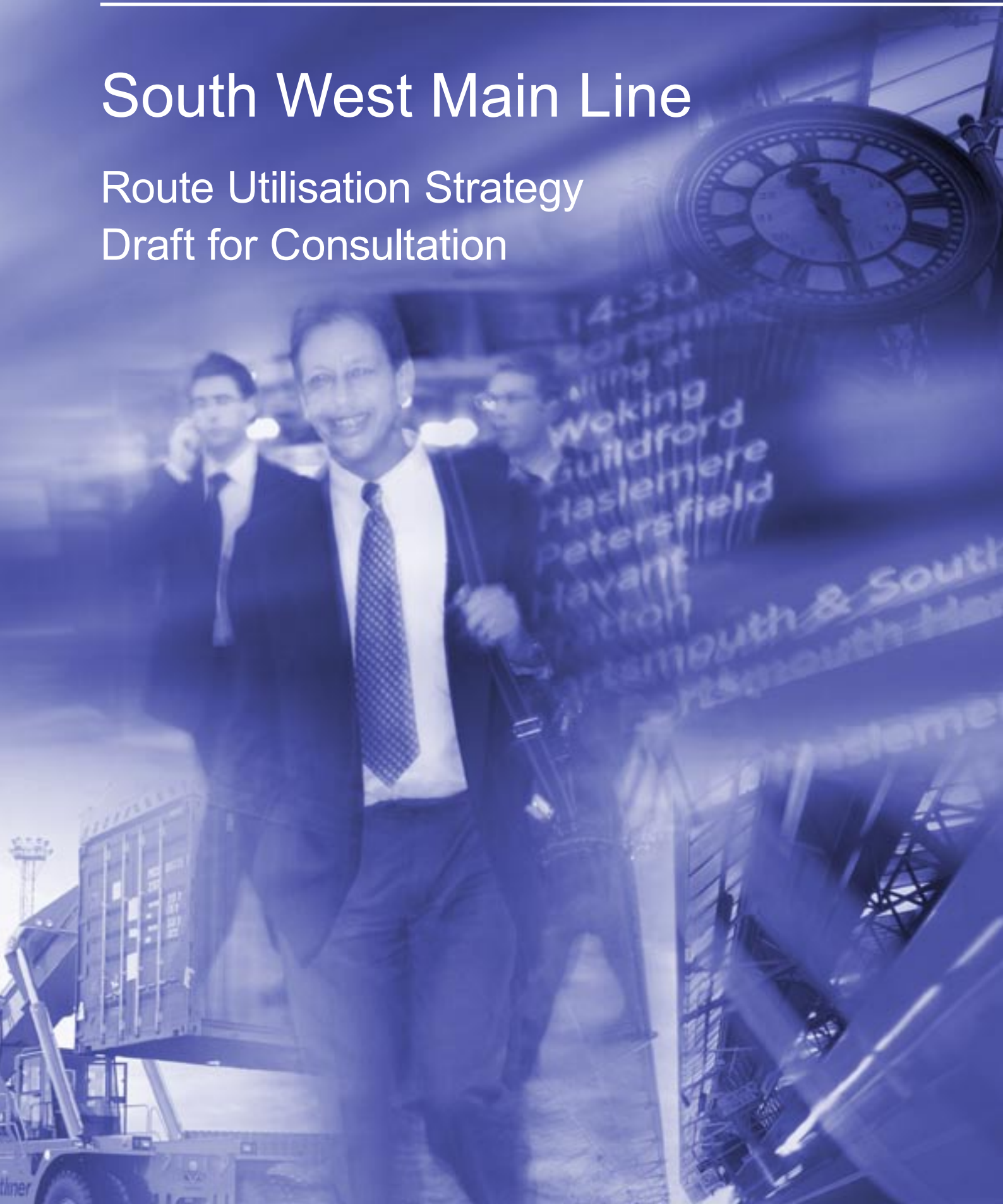
Network Rail

South West Main Line

Route Utilisation Strategy
Draft for Consultation



Foreword

I am pleased that we are publishing the Draft Consultation Document for the South West Main Line Route Utilisation Strategy. wmonths work in collaboration with rail industry partners and wider stakeholders whom I thank for their contribution.

The recent Government White Paper, The Future of Rail, conferred significant additional responsibilities upon Network Rail, largely in the areas of industry planning and accounting for performance. The publication of this Route Utilisation Strategy is one of the first concrete manifestations of these new responsibilities.

We are proud that Network Rail has been entrusted with these additional responsibilities, including the Route Utilisation Strategies. Our approach to carrying out this role has drawn heavily on the previous experience of the Strategic Rail Authority. However, we now seek a more collaborative approach with the rest of the industry, actively seeking their views and holding meetings with various stakeholders in order to integrate this work with our own plans for a more route-based approach to the long term planning of the network.

This consultation document sets out the options for change to meet the growing requirements of all railway users within the relevant constraints. At this stage, the proposals are simply options for consideration. The views of stakeholders responding to this consultation are of tremendous importance to us, and we intend to undertake more work as required to review these alternative options before moving forward.

In taking these options forward, we need to make best use of the resources available to us. Where appropriate, these options may need to be considered as part of the Government's High Level Output Specification as an input to the 2008 periodic review.

This is the first RUS for which we have been responsible and it will shortly be followed by others. We are also publishing a Consultation Guide explaining the RUS process, how people can contribute and a programme of work for the remainder of the network. We will also be publishing a more detailed technical manual in the near future.

I hope that everyone interested in the future of rail will participate in this consultation and give their views, bearing in mind the challenges and constraints facing us as we move forward.

John Armitt
Chief Executive

Correct at time of going to print

Executive Summary

Improved use of rail capacity is a central element of the Government's plans for effective delivery of its rail objectives. The key requirement is to make efficient use of the current route capacity and to develop this capacity where appropriate within the available funding.

Demand on the South West Main Line is dominated by the London commuter market, with around 85,000 people alighting at either Waterloo or Vauxhall every morning. Some routes experience serious overcrowding. Passenger kilometers on the route in the morning peak are forecast to grow by 14% over the 10-year period of this RUS. There is no easy way to deal with this demand: the analysis so far suggests that a signifcant volume of investment will be required to enhance the capacity and capability of the SWML railway system.

The South West Main Line (SWML) was chosen to be the pilot Network Rail led RUS for the following reasons:

- To inform the development of the specification for the South Western franchise.
- Overcrowding and growth issues on certain sections of the line need to be addressed.
- The future of the Waterloo International Terminal after the expected withdrawal of Eurostar services in 2007 is being examined, and capacity at London Waterloo is critical to any future requirements for the SWML.
- To inform the development of the Department for Transport's High Level Output Specification for an area where there is significant congestion on parts of the route combined with substantial potential growth.

The scope of the SWML RUS encompasses most rail lines within west Surrey, Hampshire and parts of Dorset, Devon and Wiltshire, together with many lines within south-west London that connect into the central London termini. The strategy will primarily cover the anticipated duration of the South Western franchise period of 2007 to 2017, although it will look further into the future to identify major factors that influence future infrastructure projects in particular.

The RUS has been developed in conjunction with the Department for Transport, the Association of Train Operating Companies, South West Trains, Transport for London, and the Freight Operating Companies. These organisations have worked together through a Stakeholder Management Group, being joined in the regular meetings by the Office of Rail Regulation as an observer.

The key issues for the area covered by the SWML RUS are as follows:

- Passenger demand has increased significantly since the mid 1990's, with the number of journeys for the main operator, South West Trains, increasing from 118 million in 1997/98 to 144 million in 2003/04, which represents growth of approximately 22%.
- Around 80% of journeys in the morning peak (07:00 to 10:00) are commuting journeys.
- With this high level of demand, overcrowding is an increasingly important issue. The Passengers In Excess of Capacity measure has been consistently above the target level of 3.0% since the late 1990's, being typically in the range of 4-5% on average across the morning and evening peaks combined. Crowding is, however, more severe during the morning peak as the evening peak tends to be less concentrated within a certain time band.
- Rail freight demand is primarily focused around the flows from Southampton to the North of England. Demand for this traffic has been consistent over the last few years. This demand is currently adequately accommodated by the existing network, although the lack of a W10 gauge cleared route is becoming an important issue. There are a number of smaller flows across the SWML RUS area but these are not predicted to change significantly over the period of the RUS.
- Rail network capacity is heavily utilised in many key sections of the SWML RUS area. This constrains the extent to which additional services can be accommodated, and has a significant impact on the performance of the existing services. Locations that are particularly constrained include London Waterloo, the section of line between Clapham Junction and London Waterloo, the Woking Junction area, the Portsmouth area and sections of the West of England Line (primarily due to the low infrastructure capability).

The issues outlined above indicate that the rail network in the SWML RUS area is intensively used, and that there are high levels of demand for passenger and freight services across many parts of the route. These factors already impose significant pressure on current operations, but there are also a number of predicted changes that will influence the optimum strategy for the period of the SWML RUS. These include:

- Demand forecasting work has indicated that large scale growth in passenger demand throughout the period 2003 to 2016 is expected across the majority of services within the SWML area. This is demonstrated by a predicted 23% growth in passenger kilometres travelled when unconstrained by service capacity and of 19% growth when overcrowding constraints are applied.
- Freight growth is predicted to be in the region of 15% to 20% by 2017. This is spread across the three main commodity types of intermodal, aggregates and automotive, with the levels varying between these types of traffic. Whilst this level of growth could almost certainly be carried by the existing network, it would place some additional pressure on the operational performance of the network.
- Significant growth is predicted in the proportion of freight traffic comprised of 9'6" containers. This traffic requires W10 gauge if it is to be transported by normal height wagons.
- The new timetable introduced by South West Trains in December 2004 has made a significant contribution to the improvement in performance seen since that date. This required changes to the network operating rules which in some cases restrict further utilisation of network capacity. There are also areas that are still vulnerable to timetable driven performance issues, in particular the Portsmouth and Southampton areas where there is a complicated interaction between different passenger and freight train operating companies' services.

The issues and forecast changes detailed above lead to a number of significant gaps between what is currently deliverable and what is required to meet future demand and aspirations. These gaps are:

- Overcrowding of the network in the peak period.
- A potential imbalance between performance, service level and capacity.
- A shortage of station car parking capacity to satisfy predicted demand.
- Future passenger numbers in excess of station capacity at London Waterloo.
- Limited main line stops at Clapham Junction in the peak periods due to network capacity constraints.
- A lack of capacity at Woking Junction to provide the desired mix of service level and punctuality.
- The inability to carry 9'6" containers without using specialist wagons.
- An opportunity in the Portsmouth area to improve the balance of services.
- Insufficient capacity on the West of England line to provide the level of service aspired to.
- An opportunity in the Southampton area to improve the balance of services.
- Insufficient capacity at Reading (platforms 4a and b) to provide the required level of service.

Further work has been identified, aimed at exploring and refining the key options available to address the above issues, and to provide the information necessary to inform the appraisal process and the recommendations. The further work to take place includes:

- Investigate options to address current and future overcrowding – there are three principal options available: running more trains, running longer trains and management of peak demand. These need to be considered together as a package, and while there are possibilities identified to potentially exploit the first two, their usefulness is to some extent dependent on the effectiveness of the proposed peak management activity.
- Suburban Platform Lengthening – investigating the costs and impact of the lengthening of selected London suburban platforms to allow either 10 or 12 car trains to operate.
- Current timetable analysis – investigating the capacity implications of the changes made in the South West Trains December 2004 timetable revision and analysing the trade-offs between capacity, journey time and performance.
- Review of under-utilised stations – examining the level of current and future demand at stations, identifying where service levels may be in excess of that justified by the demand.
- Car Parking – examine areas where there is demand for station car parking that is in excess of supply, and where there is the potential to increase the available facilities.
- The future of Waterloo International – this is integrated with the DfT led project examining the potential future uses of Waterloo International. This link is critical as it dictates the options that can be considered in relation to the Waterloo area capacity constraints.
- Clapham Junction – investigating the infrastructure change necessary to increase the number of main line services that can call at Clapham Junction, linked with a station capacity study.
- Woking Junction – exploring the options for and impact of Woking Junction grade separation.
- W10 Loading Gauge – assess the impact on future demand, capacity and freight efficiency of the lack of a W10 route from Southampton to the West Coast Main Line, including linkage with existing infrastructure enhancement projects.
- Portsmouth Area Service – analysing of the timetable and the operational relationship between multiple passenger train operators in this operationally sensitive area.
- West of England Line Infrastructure Enhancement – identifying the infrastructure upgrade necessary to meet the stakeholder aspirations for an hourly Waterloo to Exeter service and a further hourly Axminster to Exeter service.
- Southampton Area Service - analysing of the timetable and the operational relationship between multiple passenger and freight train operators in this operationally sensitive area.
- Reading Infrastructure Enhancement – investigating the costs and capacity impact of options to improve access at Reading station for Wokingham line services.

This consultation document outlines the progress in the development of the SWML RUS so far and seeks constructive contributions to provide relevant information on regional and local issues. The document comments on the options that are available to address the gaps outlined above. Due to the time constraints relating to the DfT franchise replacement process, the duration of the consultation period will be less than the standard twelve weeks.

Contents

1 Background

1.1 Introduction to Route Utilisation Strategies (RUSs)

Improved use of rail capacity is a central element of the Government's plans for effective delivery of its rail objectives. The requirement is to make efficient use of the current route capacity as well as the development of further capacity, consistent with the funding that will be available during the period of this Route Utilisation Strategy (RUS).

A RUS collates and sets out existing network capacity, service provision, and usage for both passenger and freight services. It traces recent demand change and takes into account future change based on wider spatial and planning considerations, as well as wider stakeholder commitments and aspirations. It considers current operating performance and sets out the level of engineering access necessary to maintain the railway optimally. A RUS identifies present and future problems and opportunities for change. It evaluates these opportunities for change, putting forward for formal consultation those that offer the best value for money.

The importance of RUSs in facilitating the effective and efficient use and development of the network was upheld in the 2004 White Paper 'The Future of Rail'. Network Rail's role expanded to encompass new responsibilities covering whole industry performance and planning. Following the abolition of the Strategic Rail Authority (SRA), responsibility for leading RUS work was transferred to Network Rail. The process for the development and establishment of RUSs is reflected in a modification to Condition 7 of Network Rail's network licence and the accompanying RUS guidelines published by the Office of Rail Regulation (ORR).

The Network Licence therefore holds Network Rail accountable for the effective delivery of its RUS responsibilities. The RUS also fulfils certain requirements of EC Directive 2001/14, which stipulates that the infrastructure manager must carry out a capacity analysis on sections of route declared to be congested, to determine the restrictions on capacity, propose alternatives and produce a capacity enhancement plan.

The Government wishes to be a strong client working on behalf of taxpayers and farepayers alike. It is ultimately the major funder of both infrastructure and most train operating companies and has the ability to make choices on the balance of support for infrastructure and support for operations. In respect of the control period 2009-14, the Government will decide the level of public funding for the railways and will develop a view of the levels of capacity and reliability it wants railways to provide from this budget. This will be set out in the High Level Output Specification (HLOS) in advance of the regulatory review of access charges for the control period. Separate HLOSs will be produced for England/Wales and for Scotland. The ORR will then determine the income Network Rail needs to fund these outputs. If the funds needed exceed the level the Government wishes to provide, then the Government will reconsider the required levels of performance and capacity.

RUSs are a key part of this process with the outcome of a RUS providing an input to the HLOS, letting the Government take timely and well-informed decisions on the future strategy for the railway. Once the Government has taken a decision on any service changes suggested by a RUS, using the Franchise Agreements with train operating companies to vary service levels could facilitate its implementation. This helps to create a stable partnership between public and private sectors with the Government offering a clear strategic direction, which the industry will use to plan investment and service patterns to meet its customer needs.

The scope of each RUS is discussed at the start by a stakeholder management group with representatives from the Government (Department for Transport and/or Scottish Executive as appropriate), Network Rail, the ORR and the passenger and freight train operating companies. These parties and other funders such as Transport for London (TfL), Passenger Transport Executives (PTEs), the Rail Passengers Council (RPC) and Rail Freight Group are involved at all stages. Wider stakeholders are consulted periodically throughout the process and their input incorporated within the activity before proposals are finalised. Baseline data helps develop a common understanding for all stakeholders and the identification of options that address the key issues ensures focus on the most appropriate network investment within and outside the rail industry. PTEs and local authorities can aid the process both with their detailed knowledge of regional demand and through funding proposals.

RUSs are a means to an end and not an end in themselves. The end lies in the delivery of more effective and efficient services through a variety of mechanisms. In particular, RUSs are expected to feed into the franchise specification for the area in question as well as neighbouring franchises and the HLOS. RUSs will need to be reviewed and re-visited both as our understanding of future demand develops and as the cost and funding of services and infrastructure changes.

1.2 Consultation paper

The South West Main Line (SWML) RUS is the pilot for the new process established following the rail review. This consultation paper sets out the relevant background information on the SWML RUS area, outlines the issues (gaps) that it faces currently and those that it is predicted to face in the period 2007-2017. The paper then outlines the options to be developed to address these gaps and the next steps that will be taken in each case. The document is work in progress in this respect.

The opportunity to present this consultation document to all stakeholders, and the responses that it will generate, will help shape the final SWML Route Utilisation Strategy.

The key dates and contact details for the consultation process are detailed in Chapter 7.

2 Context and Scope

2.1 Objectives

The development of a Route Utilisation Strategy for the SWML area is required for a number of reasons. The primary drivers of the SWML RUS are to:

- inform the development of the Government's specification for the South Western franchise;
- inform the required outputs for infrastructure renewals; and
- inform the High Level Output Specification.

The SWML RUS will enable Network Rail to develop an informed renewals and maintenance programme in line with the South West franchise specification and reasonable requirements of freight and other operators. The SWML RUS will also facilitate the further development of an engineering access strategy that takes into account both cost issues and the impact on passenger and freight users, in the light of both current and future changes in rolling stock and timetables. The SWML RUS will recommend efficient use of, and identify opportunities to improve the network.

2.2 Stakeholders

The Department for Transport, Transport for London, the Association of Train Operating Companies, South West Trains and the Freight Operating Companies that operate on the route have been represented on the SWML RUS stakeholder management group throughout its development. The Office of Rail Regulation has also participated in the stakeholder management group as an observer.

Wider stakeholder briefings have been held in Exeter, London and Southampton to explain the context and scope and invite correspondence on local issues.

2.3 Linkage to other work streams

2.3.1 South Western Franchise Replacement

The South Western franchise replacement is scheduled to be let in February 2007. The replacement combines the existing South West Trains and Island Line franchises, both of which are currently operated by Stagecoach. The new franchise is anticipated to run for 10 years.

The Department for Transport is developing the specification for the new franchise. The draft specification will be shared with stakeholders and the final specification will be produced prior to the issue of the Invitation to Tender during March 2006 to short-listed bidders.

Bidders will be asked to submit their bids during June 2006 and the successful bidder will be announced in the later part of 2006.

2.3.2 Other refranchising processes

The Greater Western franchise is currently out to tender, and will interface with the SWML RUS at Exeter, Salisbury and Reading as well as the North Downs line. The franchise is expected to begin in 2006.

The new South Central franchise is not yet in development. It will interface with the SWML RUS at Epsom, Clapham Junction and Havant and is expected to begin in 2009.

2.3.3 The Future of Waterloo International Terminal

Waterloo International Station is expected to be vacated by Eurostar International when the service transfers fully to the Channel Tunnel Rail Link in 2007, running into St Pancras Station. The Department for Transport has started a review process aimed at determining the most appropriate future usage for the site, with a number of possibilities being identified by the rail industry. As Waterloo Station is the London terminus of the SWML and therefore the key factor in relation to a number of aspirations, the outcome will be of the highest importance for the SWML RUS area. Network Rail will therefore continue to discuss this with the Department for Transport to inform their decision.

2.3.4 Freight Route Utilisation Strategy

Network Rail is undertaking a Freight Route Utilisation Strategy on behalf of the industry. The study commenced in October 2005. The initial phase of the Freight RUS involves establishing nationwide demand forecasts and preferred routing statements for the freight industry for the next 10 years. Subsequent work will focus on key capacity, capability and gauge constraints on the network over the same time period.

The study is presently planned to be published, following full consultation, in early 2007. However, key outputs from the work may be implemented before its conclusion.

2.3.5 Interfaces with other Route Utilisation Strategies

- Great Western Main Line RUS (produced by the Strategic Rail Authority), which interfaces with the SWML RUS at Reading and Exeter. This RUS was published in June 2005;
- Brighton Main Line RUS (produced by the Strategic Rail Authority), which interfaces with the SWML RUS at Epsom, Havant, Dorking and Clapham Junction. This RUS has not been published and is under consideration by the Secretary of State; and
- Cross London RUS (led by Network Rail), which interfaces with the SWML RUS at Clapham Junction and is expected to be published for consultation in November 2005.

2.3.6 Regional Planning Assessments and Regional Strategies

The objective of the railway Regional Planning Assessments (RPAs) is to develop an understanding of the priorities for development of the railway over the next 5-20 years in the wider context of planning policy and strategy at the regional scale. The RPAs have a longer time horizon than the RUSs and aim to establish the objectives for the railway within the wider transport system in meeting regional needs.

The South West Main Line scope area will be covered in three RPAs: the Southern RPA, covering South London, Surrey, Berkshire (part), Sussex and Hampshire; the Thames Valley RPA, covering Berkshire; and the South West RPA, covering Wiltshire, Dorset and Devon. The Southern RPA is in preparation and is expected to be published in 2006. Work on the South West and Thames Valley RPAs will commence in due course.

RPAs are the interface between the railway planning framework and the regional planning strategies. In the case of the South West Main Line scope area, the relevant regional strategies are the London Plan/Mayor's Transport Strategy, the South East Plan/ Regional Transport Strategy and the South West Regional Spatial Strategy/Regional Transport Strategy.

2.3.7 Transport for London's Rail Corridor Plans

Rail Corridor Plans (RCPs) are designed to set out Transport for London's strategy for the development of the rail network in the Greater London Authority area, to provide adequate capacity for passengers and freight and to support the spatial development objectives within the London Plan.

These objectives are to:

- accommodate London's growth within its boundary without encroaching on open spaces;
- make London a better city for people to live in;
- make London a more prosperous city with strong and diverse economic growth;
- promote social inclusion and tackle deprivation and discrimination;
- improve London's accessibility; and
- make London a more attractive well designed and green city.

TfL's Rail Corridor Plan for London and the South West is examining in detail the demand patterns in the corridor and is developing a strategy which TfL will use as a base for its planning and its key inputs into the DfT's franchise specification, Regional Planning Assessment and Network Rail's final SWML RUS document. This plan is currently being developed, and is expected to be published in November 2005.

There has been, and will continue to be, close co-operation and information exchange between the teams responsible for the Rail Corridor Plan and the RUS.

2.3.8 Other plans and strategies

ORR has initiated a possessions review which will address the following areas:

- an assessment of whether Network Rail's revised possessions strategy is efficient from a whole-industry perspective and hence is compliant with Condition 7 of Network Rail's network licence;
- Network Rail's processes for planning and mitigating the impact of possessions such as the provision of accurate and timely information on capability and capacity of alternative routes;
- the extent to which Efficient Engineering Access would generate efficiencies in excess of those assumed by the Access Charge Review of 2003 and the corresponding amount by which access charges should be reduced to reflect those efficiencies;
- whether the existing Schedule 4 regime in franchised passenger train operators' track access agreements may need to be modified to ensure that the compensation payable by Network Rail properly reflects the effects of the revised strategy on train operators' businesses;
- the impact of Efficient Engineering Access on freight operating companies; and
- the need for cross-industry cooperation in possessions planning.

It is expected that ORR will publish its conclusions in December 2005. Further information is available on the ORR website at http://www.rail-reg.gov.uk

Published Local Implementation Plans, Local Transport Plans, Regional Spatial Strategies and Multi-Modal Studies have been considered in the development of this strategy.

2.4 Scope

2.4.1 Geography

The strategy will cover the South West Main Line from Waterloo (Network Rail's Strategic Route 3), and much of the West of England Line (Network Rail's Strategic Route 4). It will include most subsidiary routes along this corridor. The SWML RUS broadly encompasses the routes that the DfT intends to include within the new South Western franchise.

This area comprises rail lines within west Surrey, Hampshire and parts of Dorset, Devon and Wiltshire together with many lines within south-west London that connect those lines with central London termini. The route also includes the line from Waterloo to Reading and the area includes the main lines from Waterloo to Weymouth and Portsmouth.

The south-west London sections form a tight network serving many busy commuter stations in the London Boroughs of Wandsworth, Merton, Richmond upon Thames, Kingston upon Thames, and Hounslow, centred on the line from Waterloo to Reading.

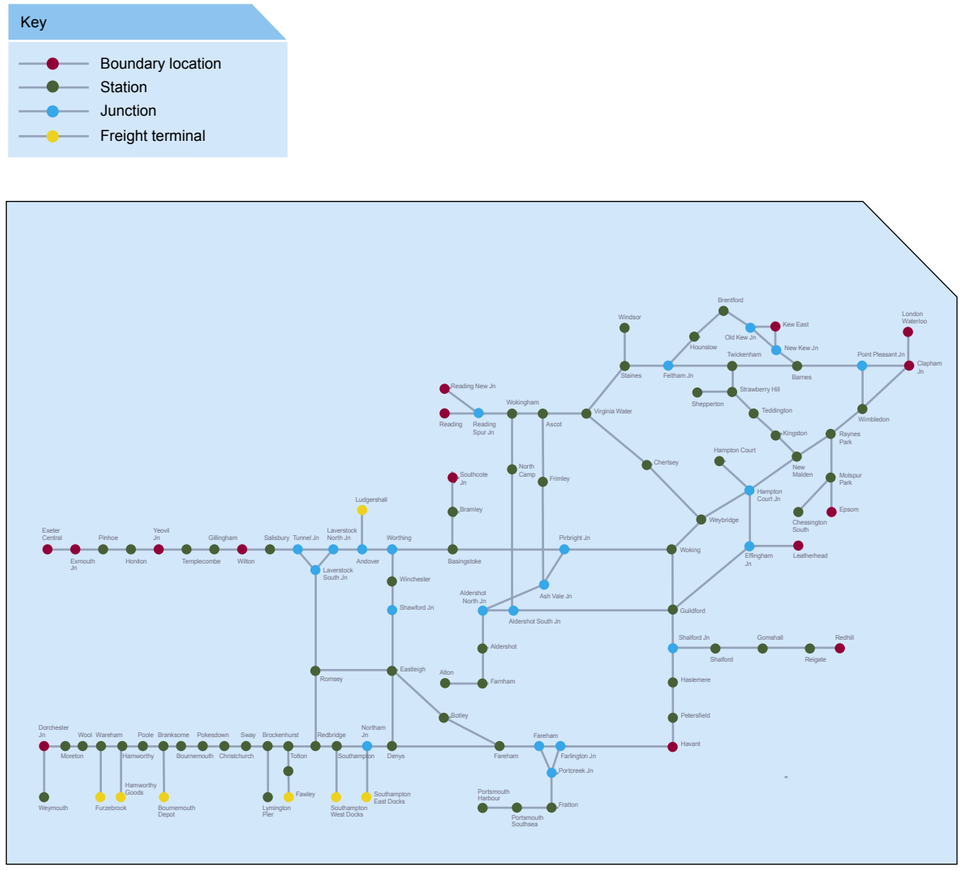
The route encompasses a number of other lines including the Redhill to Guildford and Wokingham line (where it joins the line to Reading) and the Netley and Botley lines, which extend the coastal route west of Havant.

The routes from Waterloo to Exeter Central, Reading to Basingstoke and Southampton / Eastleigh to Salisbury are also included. Services on routes that are not contained within the scope have also been considered. These include services between Westbury and Wilton Junction, Westbury and Weymouth and services on the Great Western Main Line at Reading, Castle Cary and west of Exeter.

The scope includes the impact of services that originate from Waterloo and the North Downs line on the Great Western Main Line in the Reading area.

The Southampton to Basingstoke section is part of an important freight route to the Midlands, North West and Scotland. The major freight flows are along the South West Main Line via Basingstoke and Reading; some traffic continues on the main line through Woking and Virginia Water and into London.

Map A: The scope of the SWML RUS.



Freight traffic from the South Coast to Bristol and Wales is transported on the route via Redbridge Junction near Southampton and Eastleigh East Junction. Clapham Junction to Old Kew Junction on the Hounslow loop is a diversionary route for freight traffic into North London from Kent and Sussex.

This strategy does not include the Island Line which is included within the list of proposed Community Rail lines.

2.4.2 Timeframe

This strategy primarily covers the anticipated duration of the South Western franchise period, 2007 to 2017, although it will look further into the future to identify any major factors that would influence route strategy over the franchise period and the longer-term capacity aspirations of freight.

3 Baseline

The South West Main Line acts both as a major commuter artery into London, and a provider of longer-distance connections. Roads are the major competitive transport mode, with the M3 motorway and A3 providing parallel routes to many of the locations served by the railway. London Underground also operates services from Richmond, Wimbledon, Vauxhall and Waterloo.

The South West Main Line RUS scope covers approximately 1,093 route kilometres, with 2,128 track kilometres. Around 71% of this track is electrified by third rail.

3.1 Infrastructure

There are varied infrastructure characteristics on the route, which have resulted in different levels of current route capability.

- The main lines from Waterloo to Worting Junction are four-track, electrified lines, with linespeeds up to 100mph.
- The line from Worting Junction to Weymouth is predominantly two-track, with a short section of single line east of Dorchester. It is also electrified with linespeeds up to 100mph.
- The lines from Woking Junction to Portsmouth Harbour and associated lines from Portsmouth to Eastleigh and St Denys are two-track, with the exception of a single line section between Fareham and Botley, and electrified with linespeeds up to 90mph.
- The branch line to Lymington Pier from the main line at Brockenhurst is electrified and single track.
- The main line from Worting Junction to Exeter is two-track as far as Salisbury with linespeeds up to 90mph. Further west of Salisbury the line is predominantly single with occasional passing loops and linespeeds up to 85mph. The entire line is non-electrified.
- The suburban network extends around the line from Waterloo to Reading, and encompasses lines serving Richmond, Hounslow, Shepperton, Kingston, Windsor and Eton Riverside, Ascot, Chertsey, Hampton Court, Chessington South, Epsom, Guildford via Cobham, and Alton. These are electrified and two-track throughout, with the exception of Farnham to Alton and Frimley to Ash Vale which are single line.
- Other lines include the North Downs line, from Redhill to Wokingham, Basingstoke to Southcote Junction and the lines from Eastleigh and Redbridge to Salisbury via Romsey. These are two-track and non-electrified throughout, with the exception of the Eastleigh to Romsey section, which is single-track, and Reigate to Redhill which is electrified.

There are facilities used for train maintenance and berthing at Clapham Yard, Wimbledon Park, Strawberry Hill, Basingstoke Barton Mill, Farnham, Fratton, Eastleigh, Northam, Bournemouth and Salisbury.

For more detail, Network Rail's Route Plans should be consulted, specifically Strategic Routes 3 and 4. The Route Plans can be viewed on line on the Network Rail website at www.networkrail.co.uk

3.2 Train Operators

There are currently six passenger Train Operating Companies (TOCs) running timetabled services that fall within the scope of the SWML RUS. These are:

- South West Trains, which provides franchised passenger services over the majority of the route;
- Wessex Trains, which provides franchised passenger services from Cardiff to Portsmouth and Brighton and from Southampton and Weymouth to Bristol;
- First Great Western Link, which provides franchised passenger services from Reading to Redhill and on to Gatwick Airport, and from Reading to Basingstoke;
- Virgin Cross Country, which provides franchised passenger services from Brighton and Bournemouth to Reading and on to Birmingham, the North West, North East and Scotland;
- Southern, which provides franchised passenger services from London and Brighton via Havant to Southampton or Portsmouth and from London Victoria to Horsham/Guildford via Leatherhead; and
- Eurostar, which provides open access passenger services from London Waterloo International to Ashford and Europe. This service is expected to run from London St. Pancras from 2007.

The SWML is also used as a diversionary route for First Great Western services when parts of the Great Western Main Line are shut.

Four Freight Operating Companies (FOCs) run trains on the South West Main Line RUS area: English Welsh and Scottish Railway (EWS), Freightliner (both Intermodal and Heavy Haul) and GB Railfreight.

Appendix A lists the passenger services in the South West Main Line area.

The current South West Trains franchise is due to expire in 2007, and will be put out to competitive tender. Other franchise processes are mentioned in section 4.4 below.

3.3 Profile of the freight market

The key freight flows and the relevant operators are as follows:

Key flows:

- Southampton/Eastleigh towards Reading, Birmingham and the north of England. (Also may be routed via Romsey and Worting Junction to Basingstoke). – EWS, Freightliner Heavy Haul, Freightliner Intermodal and GB Railfreight services;
- Southampton/Eastleigh towards London and beyond via Woking, Byfleet and New Haw, Byfleet Junction, Virginia Water and the Hounslow Loop. Thence via Old Kew Junction and Kew East Junction (towards Acton Junction for the Midland Main Line, West Coast Main Line and North London Lines) or via Chiswick towards Clapham Junction and the South London Lines. Those from the Midland Main Line, West Coast Main Line and North London Lines join flows through Chiswick at New Kew Junction. – EWS, Freightliner Heavy Haul, Freightliner Intermodal and GB Railfreight services;
- Eastleigh to Westbury/Merehead and towards Bristol via Chandlers Ford, Romsey, Salisbury and Warminster. – EWS and Freightliner Heavy Haul service;
- Eastleigh/Fawley to Woking and thence Holybourne (on the Alton line). – EWS service;
- Services from terminals to the west of Southampton (including those at Wool, Hamworthy, Marchwood MOD and Fawley towards Southampton/Eastleigh and beyond). – EWS services;
- Services to and from terminals to the east of Southampton including those at Fareham, Chichester and Botley. – EWS services; and
- Services to and from Quidhampton (near Salisbury) and the MOD terminals at Ludgershall and Warminster. – EWS services.

The busiest locations are those centred on the docks and container terminal at Southampton and Eastleigh Yard. These are Southampton Eastern and Western Docks and the Freightliner container terminals at Southampton Maritime and Millbrook.

At Eastleigh there is a Network Rail National Delivery Service Local Distribution Centre, an aggregates terminal, an EWS locomotive depot and a marshalling yard that acts as an originating or terminating point for many services and the recessing of trains.

The Fawley branch line (from Totton) serves the MOD port at Marchwood and the oil refinery at Fawley.

A high proportion of freight trains in the area carry containers. However, there are also petroleum, infrastructure and construction material trains, metals flows to Hamworthy and services to and from the various MOD locations.

A table showing the quantity of freight flows within the SWML area can be found in Appendix A.

3.4 Profile of the passenger market

3.4.1 Introduction

The SWML RUS covers a mixed-use railway dominated by commuting to and from London from south-west London, Surrey, Hampshire and Berkshire. However, off-peak travel to London has been growing in importance in recent years, and there are also significant flows into Southampton, Portsmouth, Exeter, Woking and Guildford, and important tourist and leisure markets to and from the south coast and Salisbury.

3.4.2 Profile of current demand

Demand in the scope area has increased significantly since the mid-1990s. For the main operator South West Trains (SWT), the number of passenger journeys per year increased from 118 million in 1997/98 to 144 million in 2003/04, growth of around 22% in six years. Passenger numbers in the peaks alone increased by around 20% over the same time frame, according to SWT passenger counts. Passenger kilometres increased at a similar rate of 23%, up from 3,487 million to 4,290 million over the same time frame (source: SRA National Rail Trends and Rail Industry Monitor.)

Waterloo is the main London terminal for the route. The total number of passengers alighting at Waterloo in the morning peak period is in the region of 75,000, with around 10,000 more alighting at Vauxhall. Clapham Junction is also of strategic importance within London, giving interchange possibilities for passengers travelling to alternative destinations within the capital.

Overall, around 80% of journeys in the morning peak period (07:00 to 10:00) are commuting journeys, making travelling to work the most dominant journey purpose. However, there is some variation by service group, with the longer distance service groups such as Waterloo-Southampton/Weymouth and Waterloo-Portsmouth having relatively lower proportions of commuters and the suburban service groups carrying relatively more.

Table B (p20) presents the busiest stations in the study area in terms of the modelled number of people boarding and alighting trains in the morning peak in 2003 (source: Planet South model). The figures relate to all boarders and alighters at the stations, not just those using the SWML; however, the figures at Clapham Junction are for the SWML platforms only. Clapham Junction is the busiest station in the study area, in terms of boarders, with 11,000 people boarding trains in the morning peak. Waterloo actually has the second highest number of boarders, demonstrating that a significant number of contra-peak journeys are made out of Waterloo during the morning peak. Wimbledon, Earlsfield and Surbiton have the highest number of departing passengers in suburban London, and Woking

the highest outside the Greater London area. Note that these numbers include all journeys, not just those that use the SWML.

With the already high volumes of passengers using the lines into Waterloo growing over recent years, overcrowding has become an increasingly important issue. Crowding on train operating companies' services is monitored using a measure known as Passengers In Excess of Capacity (PIXC). PIXC, expressed as a percentage, is the total number of passengers carried over and above the capacity of each train, divided by the capacity of each train. Passenger loadings are recorded at the "critical point" in the train's journey, that is, the point where loadings are at their highest. If the journey time is 20 minutes or less between the two stations where loadings are at their highest, the definition of capacity includes an allowance for standing of typically 35% of seats (varies according to the design of the train). PIXC levels of 4.5% for an individual peak and 3.0% for the average of both peaks are the maximum limits under the terms of Train Operating Companies' (TOC) franchise agreements.

PIXC levels have been consistently above the target level of 3.0% since the late 1990's being typically in the range of 4-5% on average across the morning and evening peaks combined. Table C (p21) shows PIXC levels for each of SWT's service groups in 2005 following the major December 2004 timetable change, split by a.m. (07:00-10:00 arrivals at Waterloo) and p.m. peak (16:00-19:00 departures from Waterloo). The table indicates that:

- crowding is more severe during the morning peak, with an overall PIXC level of 7.4%, as the evening peak demand tends to be more spread out;
- morning peak crowding exceeded the PIXC threshold on all service groups with the exception of Reading to Waterloo, Basingstoke to Waterloo and Portsmouth to Waterloo via Eastleigh.

Due to the standing allowance on some trains referred to above, it is difficult to use the PIXC measure to compare absolute levels of crowding between service groups. Table D (p22) presents the peak loadings data in terms of seated load factors, that is the number of passengers recorded at the critical point expressed as a percentage of the number of seats at that point. Load factors across the a.m. (07:00-10:00 arrivals at Waterloo) and p.m. (16:00-19:00 departures from Waterloo) peaks as a whole, and specifically across the high peak hours of 08.00-09.00 and 17.00-18.00, are presented.

From the table it can be seen that overall, passengers exceed seats by 13% in the morning peak, whereas in the evening peak the number of seats exceeds the number of passengers. This again demonstrates that the evening peak is more diffuse. At the height of the morning peak between 08.00 and 09.00 passengers exceed seats by some 40%. This high load factor is driven by heavy loadings on the inner suburban services, with a 180% load factor on the Windsor service group of particular note.

All outer suburban services reach critical loads well above 100% between 08.00 and 09.00, other than the Basingstoke to Waterloo and Portsmouth to Waterloo via Eastleigh lines, on which there are just enough seats in to meet demand. In particular the Southampton and Weymouth to Waterloo and Portsmouth (Fast) to Waterloo services have loadings of 120% and 124% of seated capacity respectively.

In the off-peak, loadings are heavy at some times of the day, notably on the first services on which cheap day tickets are valid, arriving in London at around 10.00. More generally, loadings off-peak are within the current capacity of the train service.

3.5 Current network capacity, utilisation and performance

The preceding sections have examined separately the passenger utilisation of train capacity in the South West Main Line area and the freight traffic conveyed. This section draws these together to look at network

Table B – Busiest stations

	Total Boarders, 07:00-09:59	Total Alighters, 07:00-09:59
Clapham Junction	16800	11600
Waterloo	15200	73000
Wimbledon	10700	5900
Richmond	6400	3500
Surbiton	5500	1500
Putney	5000	3200
Woking	4600	2500
Raynes Park	3900	800
Earlsfield	3900	500
Vauxhall	2900	11800

Table C – SWT PIXC counts 2005

Service Group	Time Period	Number of Trains	Critical Load	Passengers over capacity	PIXC Level
Waterloo to Southampton and Weymouth	AM	8	3948	185	4.7%
	PM	8	3686	179	4.9%
	Overall				4.8%
Waterloo to Portsmouth (Fast)	AM	14	7402	962	13.0%
	PM	13	5878	103	1.8%
	Overall				8.9%
Waterloo to Exeter, Paignton and Plymouth	AM	6	2470	293	11.9%
	PM	6	1999	24	1.2%
	Overall				7.1%
Waterloo to Basingstoke	AM	8	3451	77	2.1%
	PM	10	4801	119	2.5%
	Overall				4.3%
Waterloo to Portsmouth via Eastleigh	AM	4	1937	18	0.9%
	PM	5	1606	30	1.9%
	Overall				0.8%
Waterloo to Alton	AM	6	3166	390	12.3%
	PM	6	2313	0	0.0%
	Overall				7.1%
Waterloo to Windsor and Eton Riverside	AM	29	18402	1558	8.5%
	PM	34	13078	298	2.3%
	Overall				5.9%
Waterloo to Reading	AM	10	6210	227	3.7%
	PM	12	5484	11	0.2%
	Overall				2.0%
Waterloo to Surrey Suburban lines	AM	62	42340	2928	7.0%
	PM	55	28757	362	1.3%
	Overall				4.7%
Total	**AM**	**147**	**89326**	**6638**	**7.4%**
	PM	**149**	**67602**	**1126**	**1.6%**
	Overall			**7947**	**4.9%**

utilisation as a whole, taking into account all trains currently operated. A number of generic factors contribute to the overall train service performance. These include the extent of infrastructure and rolling stock failure, the ability of train operations to work within timetable allowances and the structure of the timetable, given infrastructure and rolling stock capability. Trains converge on Waterloo from all over the SWML RUS scope area, and delays from this variety of locations can impact on performance throughout the scope area and beyond.

Map E shows the base occupancy levels on the SWML RUS area. This shows the percentage of time in the peak hours that the track section is occupied by a train, and is calculated by the Railsys model. The Railsys simulation software models the real world operations of the UK railways. The system analyses the historical performance of the network and uses this information to predict the likely performance after changes in track layout or timetable service frequency.

Using historical incident information, ranging from infrastructure and train failures to any other incident, the model determines the likelihood of these incidents occurring in the future and subsequently imposes incidents onto a timetable. The model then simulates several hundred 'days' to provide the likely Public Performance Measure for services on the network. The model can be run on the current infrastructure with the current timetable to provide a number of statistics, such as base occupancy statistics, or run on a proposed timetable or altered infrastructure to investigate the effect of a change in terms of performance.

The base occupancy levels are calculated at a technical level showing the impact of gradients, signal-spacing and presentation of services. It should be noted that the occupancy levels are generated without the inclusion of any external delay.

Woking Junction's high occupancy level is caused by the services waiting to cross the flat junction and queuing up in the station area.

Table D – peak loadings data in terms of seated load factors

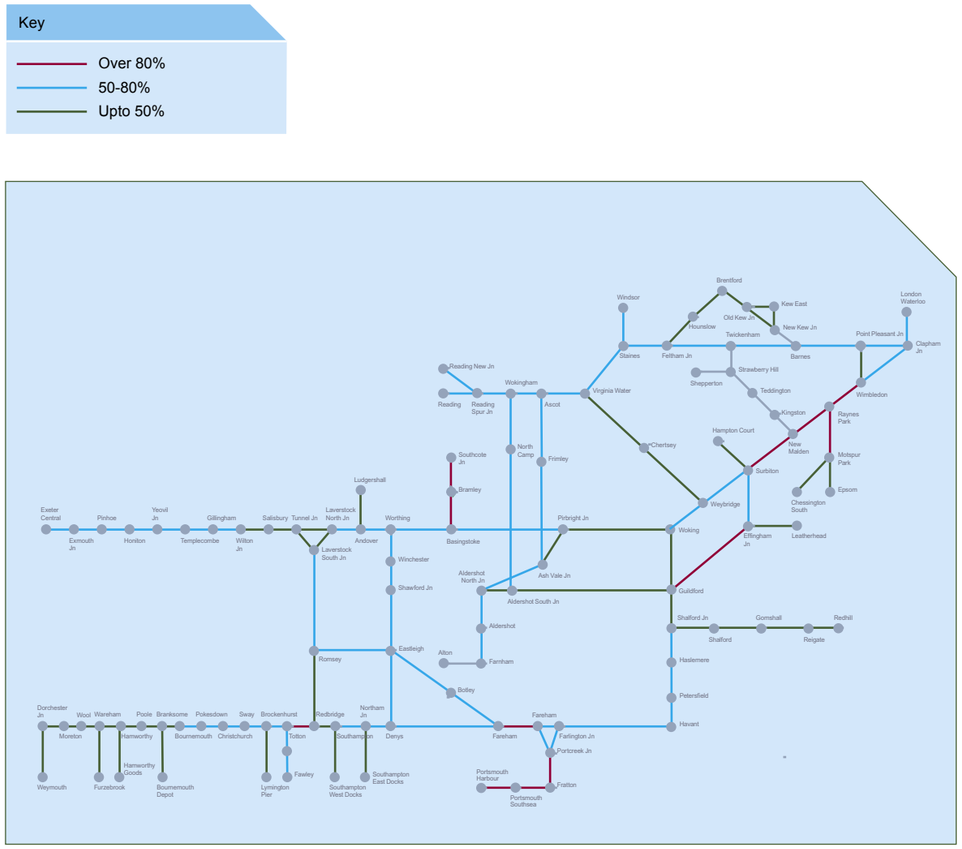
Service Group	Time Period	Seated Load Factor at Critical Load	
		Peak Three Hours	High Peak Hour
Waterloo to Southampton and Weymouth	AM	101%	120%
	PM	103%	107%
Waterloo to Portsmouth (Fast)	AM	105%	124%
	PM	87%	89%
Waterloo to Exeter, Paignton and Plymouth	AM	103%	113%
	PM	97%	86%
Waterloo to Basingstoke	AM	98%	95%
	PM	100%	91%
Waterloo to Portsmouth via Eastleigh	AM	108%	98%
	PM	79%	73%
Waterloo to Alton	AM	108%	109%
	PM	84%	84%
Waterloo to Windsor and Eton Riverside	AM	136%	180%
	PM	89%	104%
Waterloo to Reading	AM	121%	142%
	PM	98%	114%
Waterloo to Surrey Suburban lines	AM	109%	143%
	PM	84%	93%
Total	**AM**	**113%**	**140%**
	PM	**88%**	**95%**

The Portsmouth Harbour area is demonstrating high occupancy from Portcreek Junction. This is due to services waiting for platform allocation at Portsmouth Harbour, and consequently backing up along the double track section. This is further compounded by services crossing to enter Portsmouth and Southsea where they terminate in the bay platforms.

Although there are relatively few services on the West of England branch, the single line and long block sections along this stretch of line result in a correspondingly high occupancy level for the number of services. Similarly, the Basingstoke to Reading line shows high occupancy levels due to the two aspect signalling and the number of services using this line. It is anticipated that this bottleneck will be eased with the proposed re-signalling scheme for the area (See section 5.2.2 for further comment on this resignalling scheme).

The main line from Bournemouth to Waterloo has a high level of annual delay minutes, with by far the highest level of delay in the Wimbledon-Clapham Junction-Waterloo area. The Southampton area also has a high level of annual delay. Surbiton to Guildford and Basingstoke, Winchester to Eastleigh and St Denys to Southampton Central also see high delay minutes. This is influenced by the high service frequencies on the main line to Bournemouth.

Map E: Base Occupancy Statistics (2005 Timetable)



Map F shows the delay minutes across the whole area in 2004. The delay is attributed to the location where the delay was caused, and not necessarily where the delay actually occurred.

Table G below shows the delay in 2004 by root cause:

The figures show that faults with the infrastructure or the rolling stock account for over half of the delay on the SWML network. Infrastructure faults include all track circuit, points and signaling faults as well as broken rails. Train faults include any defect on a train that causes delay. External causes include trespass, vandalism, fires, bridge strikes and security alerts.

There are a number of linked issues that cause the spread of delay, varying in importance across the area. These include:

- Timetable growth since privatisation has filled much of the spare capacity in the timetable;
- The broad mix of services including stopping passenger trains, freight services and express passenger trains with new rolling stock with varying rates of acceleration and braking;
- Very heavy usage of train paths into Waterloo at all times of day;
- New rolling stock and driving practices have altered journey time characteristics, though the December 2004 timetable revision has been designed to reflect this;
- Track and signal layouts often date back many decades, and may not suit modern passenger and freight requirements; and
- Complex junctions and crossings on the level cause conflicts, especially in times of service perturbation.

The South West Main Line area is for the most part a self-contained railway. Long-distance services, and services that cross from other Network Rail routes are not plentiful, although do exist. As such, the spread of delay to and from other regions is kept to a minimum, and confined to certain areas. Where it does occur,

Map F: SWML RUS Area – Total delay in 2004

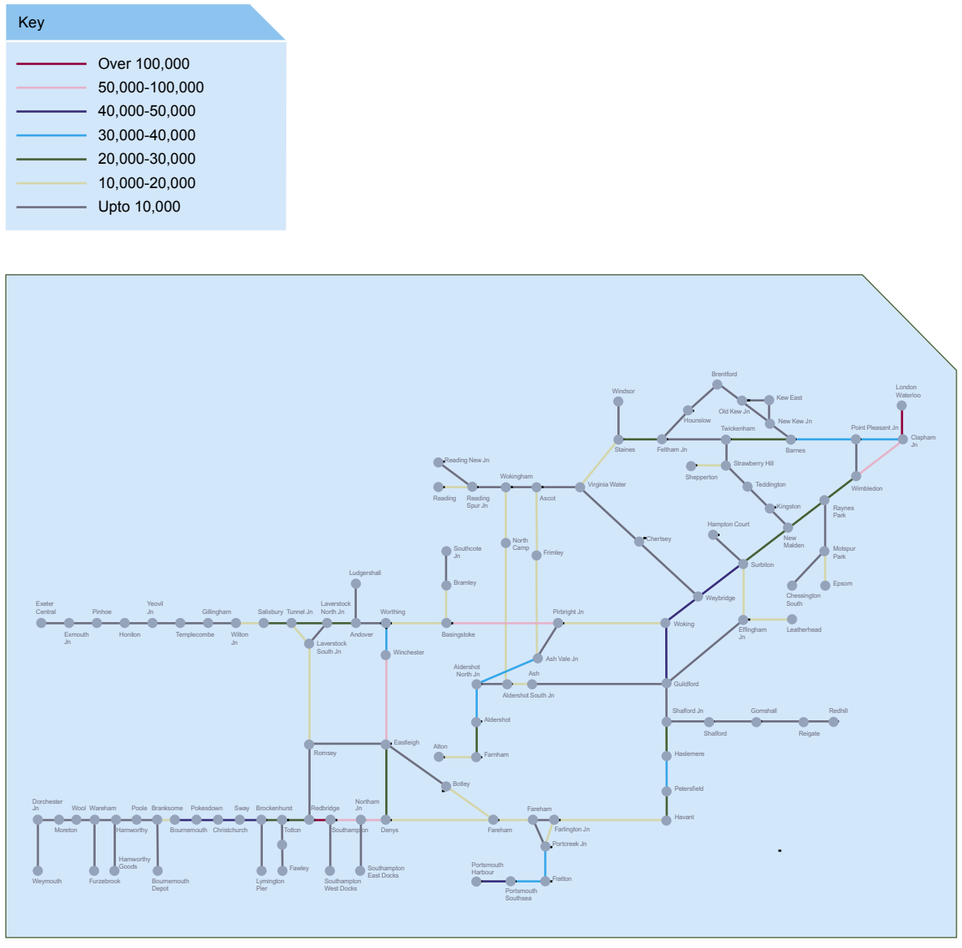
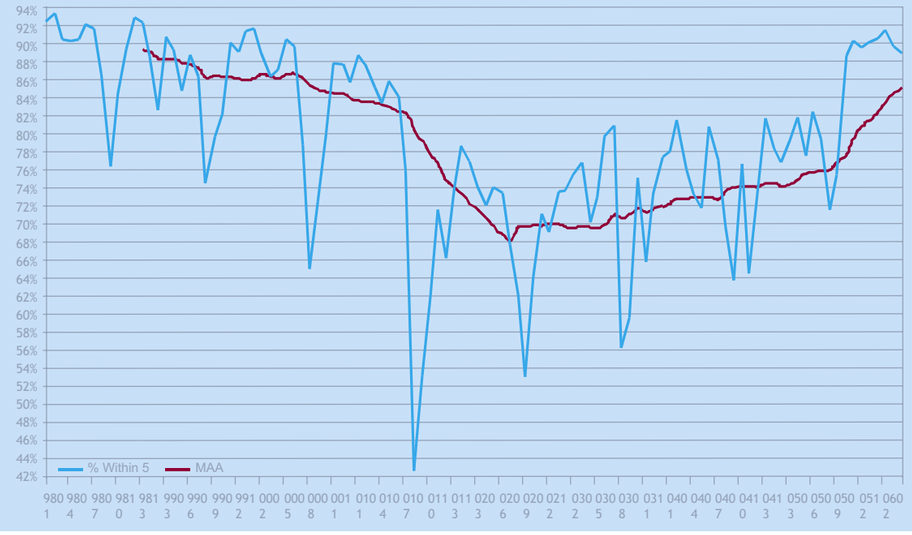


Table G: 2004 delay by root cause

Root Cause	Total Minutes Delay
Infrastructure faults	540,321
Train faults	534,356
External causes	211,355
Traincrew causes	200,904
Freight Terminal causes	142,662
Station delays	112,020
Unattributed minor delays	82,523
Weather causes	74,454
Regulation causes	72,343
Train Planning causes	52,271
Possession causes	39,904

Table H: SWT PPM 1998 to 2006 (predicted)



at Basingstoke, Portsmouth and Southampton as the main examples, the effects are acute.

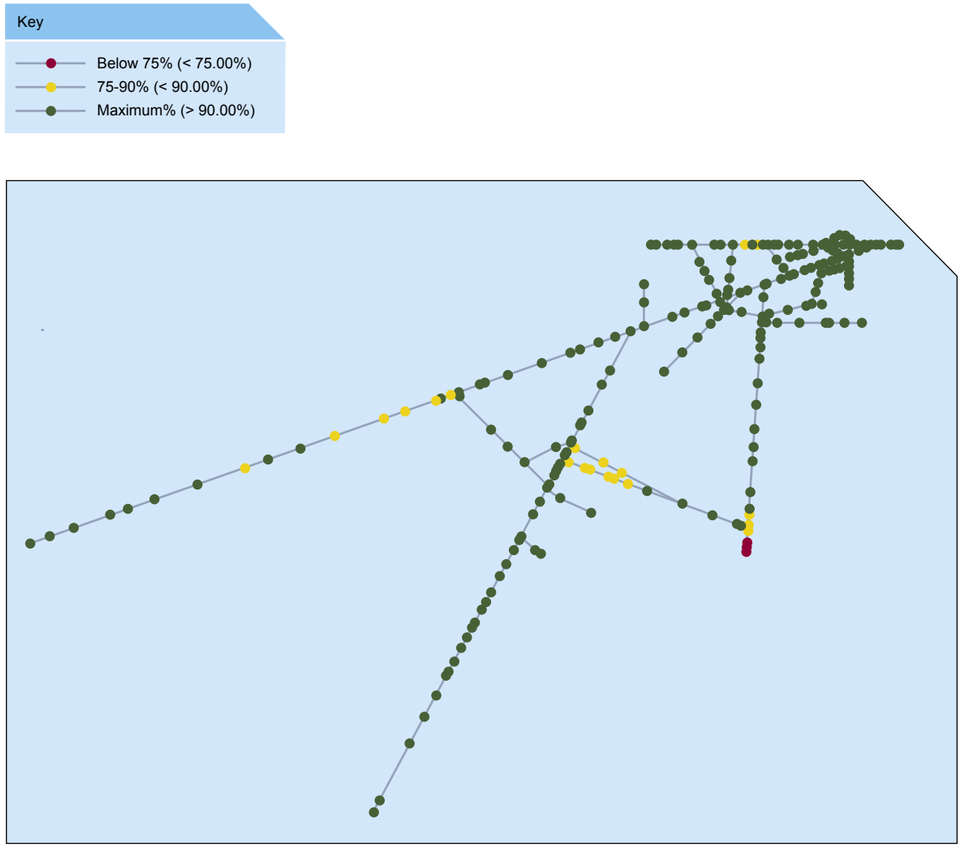
The changes made to the timetable in December 2004 sought to address many of the previous key performance problems with the removal of complex conflicting movements across junctions, a simplification of stopping patterns and a dwell time regime based on modern rolling stock. It has had a positive impact on punctuality on the South West Main Line, as shown in table H (p25):

The blue line in table H shows the percentage of South West Trains services arriving at London Waterloo within five minutes of their booked arrival time. The red line shows a "moving annual average" to show the trend rather than the specific seasonal variation. The annual low point represents the delays that occur in Autumn.

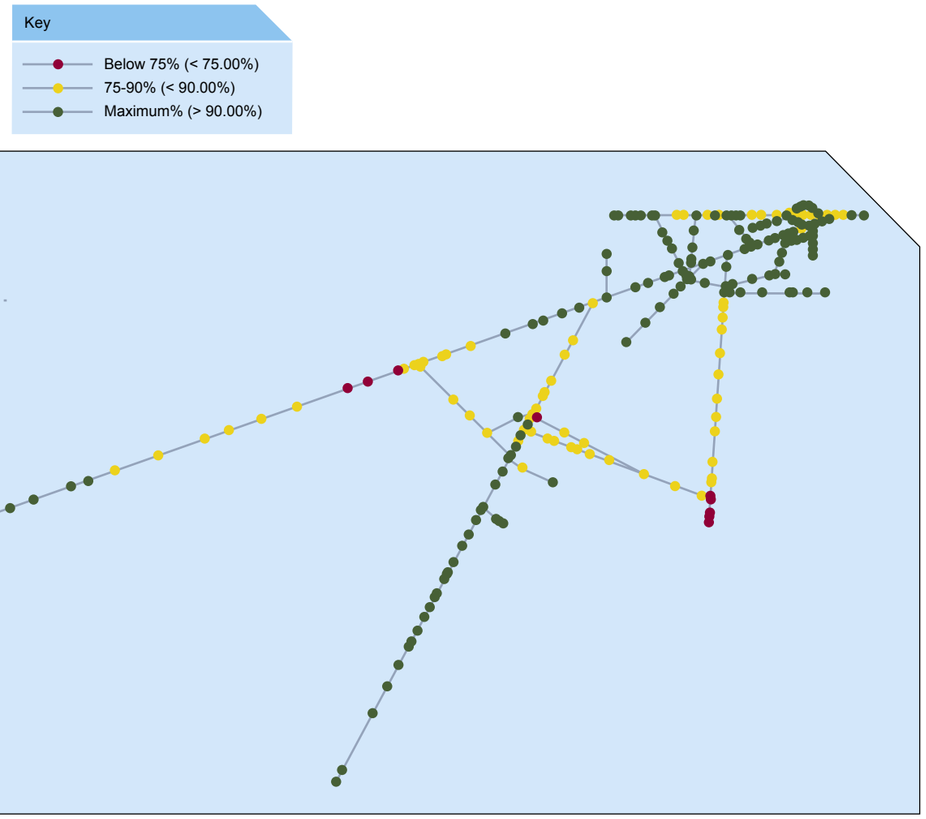
Map I shows the punctuality for services running as per the 2005 timetable with no external delays imposed upon them, as calculated by the Railsys model. It can be seen that the majority of the SWML RUS network runs within 3 minutes of timetable, with the exception of the Portsmouth area, West of England line and a small section around Southampton. The red dots around Portsmouth indicate that less than 75% of services will arrive within 3 minutes of schedule before any external delays are imposed on the network. The data is amalgamated for all services.

Map J also shows the punctuality for services running as per the 2005 timetable with no external delays imposed upon them, as calculated by the Railsys model. It can be seen from this map that the majority of services on the SWML network arrive within 1 minute of their timetabled time. The Portsmouth area and parts of the West of England line see over 25% of their services delayed by more than 1 minute, and much of the network outside the suburban area sees delays of 1 or 2 minutes to between 10% and 20% of its services. The change from green to yellow between Map I and Map J, particularly in the London area, shows that up to 75% of services arrive on-time, and that approximately 15% of the other services arrive between one and three minutes of the correct time, with under 10% of services arriving three or more minutes late.

Map I punctuality at arrival – 3 minutes



Map J punctuality at arrival – 1 minute



3.6 Engineering Access

Commencing approximately five years ago, a cyclical access strategy for the route was jointly developed by Railtrack, its maintenance contractors, and its customers. This strategy identified a programme of 'golden' possessions which sought to ensure value for money, and to minimise disruption to train services. This possession strategy is centred on a series of large (in both geographic coverage and time span), cyclical access opportunities focused around significant junctions. The aim is to provide the opportunity to undertake all major scheduled and, when possible, unscheduled maintenance activity for the specific area. Resource is used from adjacent maintenance areas to balance the time available with delivering the required activity in a timely fashion and as efficiently as possible. This approach minimises the number of short, inefficient, but generally non-disruptive possessions, although a number are still required in certain locations to enable all necessary maintenance activity to be undertaken.

This pattern of possessions has been reviewed on an annual basis and some evolution has occurred, but in essence the same principles apply today.

While the 'golden possession' approach has resulted in an engineering access regime that closely matches existing engineering requirements, there are a few locations where there is continued pressure on the access available, and a requirement to examine whether revised arrangements can be progressed without unacceptable disruption to passenger and freight services. These locations are:

- Waterloo – a cyclical access programme is sought that moves the current quantum of access into a regular pattern to improve the opportunities for inspections;
- St Denys to Redbridge – this is an area where there is a significant level of capacity utilisation throughout the day, making access opportunities difficult to obtain;
- Portsmouth Harbour to Cosham / Farlington Junctions – this is also an area where there is a significant level of capacity utilisation, making access opportunities difficult to obtain;
- Pirbright Junction to Alton – the area around Farnham depot in particular is difficult to obtain adequate access opportunities; and
- Southcote Junction (near Reading) to Basingstoke – the mix of freight and passengers services complicates the arrangement of possessions.

It is recognised that these areas are subject to heavy utilisation due to high demand, in some cases for both passenger and freight services, and therefore any increases in engineering access may require increased service disruption. This can only be progressed if the implications of the insufficient access affect network reliability to a greater extent than the reduction in benefits provided by the potentially disrupted services.

Proposals have yet to be developed and will be processed according to standard industry procedures.

There are a number of opportunities for the diversion of passenger services on the SWML RUS area where engineering access results in the unavailability of the network, therefore minimising the impact to passengers. The disruption to the passenger train service as a result of the large possession opportunities in particular are advertised well in advance, explaining where substitute bus services are to be provided and where services will be diverted.

There are fewer opportunities for the diversion of freight services though, due to the capability constraints of gauge and weight. While freight operators cannot readily divert their traffic to the roads as passenger operators can, some of the freight services have flexibility surrounding the timing and duration of their journeys. The possession planning constraints are also significantly different. The mix of passenger and freight usage at certain points on the network and these differing constraints creates the pressure on access as detailed above.

A regular pattern of access also improves the co-ordination of any alternative service provision, allowing careful planning of the access opportunities to avoid peak times, such as major leisure events, and the avoidance of midweek possessions on Friday nights in particular to minimise disruption when passenger demand is high outside of the peak commuter time. This careful planning is driven by the need to balance the maintenance requirements against passenger and freight demand.

3.7 Summary of Baseline gaps

3.7.1 Analysis of the baseline data has identified the following gaps:

- There is overcrowding on the Waterloo to Weymouth, Waterloo to Portsmouth, Waterloo to Exeter, Waterloo to Alton, Waterloo to Surrey suburban routes and Waterloo to Windsor service groups. Overcrowding is worse on all services as they get closer to London;
- Clapham Junction currently does not have the network capacity to allow all trains that currently pass through to stop there;
- Woking Junction does not have the network capacity to allow the desired mix of service level and punctuality;
- The Portsmouth area has a punctuality level that is lower than desired;
- The West of England line does not have the network capacity necessary to provide the level of service aspired to; and
- The Southampton area has a punctuality level that is lower than desired;
- Reading station (platforms 4a and 4b) does not have the network capacity to allow the desired mix of service level and punctuality.

4 Drivers of Change

4.1 Context

The purpose of this chapter is to provide a summary of the external factors that drive changes to demand for the railway. We have reflected these factors in our consideration of the gaps and options (Chapter 6). Where aspirations are outside the scope of this strategy, we have stated in Appendix B how Network Rail intends to consider them. In many cases these issues will be looked at in more depth in the Government's Regional Planning Assessments (RPAs). Section 2.3.6 contains further details on RPAs.

4.2 Forecast Growth

4.2.1 Introduction

One of the issues considered within the RUS is the question of what will happen to future rail demand if current patterns of service provision continue.

The forecasts have been developed using the framework set out in Version 4 of the Passenger Demand Forecasting Handbook (PDFH). The forecasts incorporate Government projections of economic and demographic changes, and changes to the competitiveness of non-rail modes, from a base year of 2002/03 to a forecast year of 2016/17. Specifically, the projections within London are taken from the Mayor's London Plan, whilst those outside London use planning assumptions from the DfT.

The forecasts assume that the December 2004 national rail timetable remains in operation, and that a number of schemes committed for implementation by 2016 are complete. Of particular importance to this study are the committed Public Private Partnership (PPP) changes on London Underground. These include an additional five trains per hour on both branches of the Northern Line and on the Victoria Line, and an additional three trains per hour on the Waterloo and City Line by 2016. By 2009, the Jubilee line service will be increased by six trains per hour in the peak and four trains per hour in the off peak and the train length will be increased from 6 to 7 cars.

The other assumptions, which are consistent with those adopted by Transport for London in their Route Corridor studies, include:

- Channel Tunnel Rail Link international services transfer to St Pancras
- Channel Tunnel Rail Link domestic services will be in operation
- London Buses – 30% increase in bus frequency within North & South Circular
- Docklands Light Railway – extension to Woolwich Arsenal and Stratford International
- Great Western 2005 Timetable
- East London Line Phase 1 in operation

The conclusions of the final Great Western RUS may alter the Great Western 2005 timetable, including those services which run on the SWML network.

It is assumed for the purposes of this RUS that Crossrail and the Thameslink Programme will not be implemented as both these projects are currently uncommitted schemes.

4.2.2 Unconstrained Demand

The forecasts suggest that demand for rail travel in the morning peak, if unconstrained by service capacity between 2003 and 2016, would increase by around 1.5% to 2.0% per annum, an increase in passenger kilometres of some 23% by 2016.

Table K below illustrates that the areas of highest growth are principally in the outer suburban areas, with lower growth expected from origins closer to London.

In terms of journey purposes, business travel is forecast to grow more rapidly than commuting. This means that the proportion of non-commuting journeys will increase from one in every five journeys in 2003 to one in every four journeys in 2016.

4.2.3 Constrained Demand

Increasing demand on an already busy network cannot be accommodated indefinitely. Constrained demand forecasts have been developed which take into account the extent to which passengers will be deterred from travelling by rail because of crowding on the network generally, and the relative attractiveness of one line versus another as a result of levels of service provided. The patterns of demand that result are discussed below.

Table K – areas of highest growth

Area	Unconstrained Growth in a.m. Peak Trips to London
Bracknell and East Berkshire	41%
South West Hampshire and South Dorset	40%
Petersfield and East Hampshire	40%
Southampton and Solent	38%
West of Yeovil	38%
Wokingham and South Berkshire	36%
Andover and North West Hampshire	36%
Wilts and North Dorset	36%
Winchester Area	35%
Basingstoke and North Hampshire	34%
Reading and Winnersh	31%
Farnham and Aldershot	30%
Portsmouth and South East Hampshire	30%
Chertsey, Weybridge, Oxshott and Esher	28%
Haslemere and South West Surrey	27%
Windsor, Eton and Datchet	26%
Ascot and Staines	26%
Farnborough, Bagshot and Woking	25%
Isle of Wight	25%
Queenstown Road and Battersea	24%
Guildford Area	24%
Ashford, Hounslow and Richmond	23%
Chiswick, Barnes and Wandsworth	22%
Epsom and Ewell	21%
Surbiton, Stoneleigh and Wimbledon	21%
Effingham, Dorking and Leatherhead	20%
Clapham Junction	19%

Table L below shows that the point at which some passengers are unable to get a seat on the busiest train of the morning peak is forecast to extend further out from London for the majority of service groups. In some cases the increase extends back down the line for several stations. Of particular note are Waterloo to Southampton and Weymouth, Waterloo to Portsmouth via Basingstoke and Eastleigh and the Waterloo to Alton service groups.

Figures D.1 to D.4 in Appendix D show how the profile of demand in the morning peak is forecast to vary along different lines of route, presented against the number of seats available. These load profiles indicate that, for the longer distance routes, passengers begin to exceed available seats from quite early on the route. However the number of passengers without a seat becomes more significant from Surbiton inwards on the mainline and from Richmond inwards on the Windsor line, and generally increases with proximity to central London. As would be expected, the greatest disparity between passengers and seats is at Clapham Junction and Vauxhall.

The increase in load factors towards inner London in the morning peak is expected to have an impact on the travel decisions of passengers using public transport into central London. The constrained forecasts show that by 2016, overall morning peak passenger kilometer growth for all public transport modes within the study area will be around 19%. Compared to the 23% unconstrained passenger kilometre growth quoted earlier, this suggests some 4% of passengers are deterred from travelling due to crowding. More specifically however, crowding is expected to change the balance of underground versus national rail for journeys into central London.

The forecasts show that from Surbiton outwards, the increase in loadings in the morning peak on SWT in 2016 compared to 2003 is around 19%, consistent with the total growth forecasts quoted above. However our forecasts predict lower growth in loadings further in to London because of improved train frequencies and additional capacity on London Underground under the PPP improvements (see section 4.2.1). As a result, a higher proportion of passengers are expected to choose the District Line from Wimbledon and the Victoria Line at Vauxhall to reach their final destinations. Also it is expected that the more frequent Northern line service to and from Morden will absorb some of the additional growth that originates within the inner London area.

Table L – Stations at which standing starts

Service	Station at which standing starts on busiest train – 2003	Station at which standing starts on busiest train 2016 (constrained)
Southampton and Weymouth to Waterloo	Winchester	Southampton Central or Eastleigh
Portsmouth (Fast) to Waterloo	Godalming	Witley
Exeter, Paignton and Plymouth to Waterloo	Andover	Andover
Portsmouth to Waterloo via Eastleigh	Brookwood	Eastleigh or Fleet
Alton to Waterloo	Esher	Brookwood
Windsor and Eton Riverside to Waterloo	Richmond, Wimbledon	Chiswick or Twickenham
Reading to Waterloo	Twickenham	Feltham
Surrey Suburban lines to Waterloo	Surbiton or Worcester Park	Esher or Worcester Park

4.2.4 Conclusions

Passenger kilometre growth of 23% between 2003 and 2016 would be expected in the morning peak period if crowding were not to worsen, with growth being strongest in the outer areas and weaker towards London. However, increasingly crowded conditions are expected to limit growth to a 19% increase in passenger kilometres. Further, as a result of improved frequencies and additional capacity on adjacent London Underground lines, the underground is expected to attract a greater share within London of the additional demand generated.

4.3 Freight growth

Market studies undertaken over the last few years forecast that the majority of freight growth in the SWML area will be of trains carrying one of 3 commodity types:

- **Intermodal**
  Despite planning permission having been rejected for the new deep-sea port development at Dibden Bay, intermodal growth is forecast to continue until the capacity of the existing terminals at Southampton is fully utilised. By 2017 this growth is likely to amount to an extra 5 to 7 trains per day – increasing the number of trains from the present 19-20 per day (in each direction) to approximately 25.
- **Aggregates**
  1 to 2% per year growth in tonnage is forecast nationwide for aggregates trains in the period 2007 to 2017.
- **Automotive**
  2 to 3 additional daily automotive trains are forecast by 2017 to reflect an increase in the number of vehicles handled through the port of Southampton.

Growth is also anticipated in other types of freight.

The growth in the numbers of trains carrying these commodities is likely to mean an increase of approximately 8 freight paths per day in each direction from Southampton to Reading via Basingstoke and of approximately 2 paths per day between Eastleigh and the Mendips via Chandlers Ford and Romsey.

The Freight Route Utilisation Strategy (mentioned in section 2.3.4), along with work done by the Rail Freight Group and Rail Freight Operators' Association will provide further detail as to the expected levels of freight growth.

Gauge Issues

The current freight container market is seeing a significant growth in the percentage of 'high cube' 9'6" containers. The proportion of Twenty foot Equivalent Units (TEUs) that is carried as 9'6" containers currently stands at approximately 20%. This is expected to rise to approximately 45% by 2011 and to circa 60% by 2020, resulting in pressure to examine the most appropriate way to carry these containers to protect the freight market by rail, utilise train paths efficiently and to facilitate the predicted levels of growth.

This arises because the 9'6" containers cannot be carried on standard height platform wagons (1000mm) on most of the network without structure gauge enhancement to a capability known as 'W10'. Where this is not provided they have to be carried with the use of specialist wagons which have a reduced payload of up to 33%, resulting in inefficiency in the use of paths on the network and possible pressure on capacity.

Currently all of the container traffic that traverses the SWML RUS area originates from Southampton Docks, and none of the routes away from the docks towards the primary destination (the West Coast Main Line) have been upgraded to W10 gauge. A preliminary assessment has shown that the enhancement of the route from Southampton to the WCML is likely to show a positive business case, but no funding source has been identified at present.

The case for W10 loading gauge enhancement is linked to the future share of 20’ long boxes, which is important to permit efficient use of wagon capacity (i.e. in order to load 1x 20’ and 1x 40’ of box length per standard 60’ wagon). Indications are that the proportion of 20’ boxes will remain at about the present level for the foreseeable future, and the implications of this are significant in support of the case for infrastructure enhancement to W10 capability.

The Freight Route Utilisation Study discussed in section 2.3.4 will examine the issue of gauging strategy further on a national basis.

4.4 Summary of Forecast gaps

4.4.1 Analysis of the drivers of change has identified the following gaps:

- The overcrowding detailed in Chapter 3 above is expected to worsen as over 20% more journeys are made into London by 2017;
- Future passenger numbers are forecast to be in excess of passenger capacity at Waterloo station; and
- The predicted demand for 9’6” container rail freight traffic is expected to grow. The SWML network currently cannot accommodate these containers without the use of specialist wagons.

5 Committed Schemes

This chapter lists those changes to the railway network that are anticipated to be completed by 2017. It also outlines those larger track and signalling renewals that are currently expected to be completed in these timescales, as these often provide the most cost-effective opportunity to change infrastructure.

5.1 Recent schemes

South West Trains has recently completed the withdrawal of the slam-door Mark I stock, which has been replaced by the “Desiro” fleet, with the exception of one train on the Lymington branch being used as a heritage unit. As part of this transition, Network Rail undertook a power supply upgrade project to support the introduction of new units.

SWT have also commenced the refit of the 455 suburban fleet, with 15 refurbished trains now operational. The works concentrate on the interior of the vehicles and include the removal of seats, which are replaced with a large central standing area.

The Power Supply Upgrade (PSU) project was specified to deliver, and has delivered, a supply system with the capability to operate a timetable based on that in place in December 2001. There is uncertainty as to the system’s ability to vary from this level, and this provides a potential constraint on the extent to which the service can be flexed to meet operational and commercial objectives, but the upgrade may also have provided opportunity to use some enhanced capability or to identify where additional investment may allow a further step change in network capability. The PSU project will conclude with a trial and testing programme so that informed statements of capability can be made, and a good understanding of potential constraints and opportunities is attained. One such opportunity could further upgrade the power supply to enable better use of the new fleet’s capability.

5.2 Committed schemes including key renewal schemes

5.2.1 Portsmouth area infrastructure renewal scheme

The Portsmouth area is expected to have its signalling and track assets renewed during 2007, to replace current signalling with a modern equivalent form appropriate to forecast future requirements. In addition to the renewals, a number of linespeed increases in the area will take place, as well as the installation of signalling allowing reversible working between Portsmouth and Southsea and Fratton, and in the Havant area. The through line at Havant will be removed to allow the other running lines to become reversible. A number of headways will be standardised and improved in the area.

5.2.2 Basingstoke area infrastructure renewal scheme

The Basingstoke area is expected to have its signalling and track assets renewed by late 2008, to replace current signalling with a modern equivalent form appropriate to forecast future requirements. In addition to the renewals, a number of enhancements will be implemented, including three-aspect signalling from Basingstoke to Reading and completing four-aspect signalling from Woking to Eastleigh. Full reversible working will be introduced through the main four platforms at Basingstoke. There will also be some headway improvements between Farnborough and Basingstoke and passive provision for the future installation of a line around Basingstoke station. The passive provision is being provided

in case circumstances change and a positive business case can be provided for the works.

5.2.3 Farnham area infrastructure renewal scheme

The Farnham area is expected to have its signalling and track assets renewed during 2007/08. Signalling equipment in the area dates from the 1980s and will be updated to a modern equivalent form appropriate to forecast future requirements.

5.2.4 Other signalling renewal schemes
In addition to the Portsmouth, Basingstoke and Farnham areas, the following areas are anticipated to be renewed in the RUS timescales. These projects have not yet commenced.

Feltham – Reading	2013
Marchwood	2016
St Denys – Totton	2016
Brockenhurst	2016

Several locations will have life extension work by 2017 including the line from Guildford to Portsmouth Harbour, Gillingham to Honiton, Poole to Wool and Fareham.

5.2.5 Major track renewal schemes

Significant sections of switch and crossing (S&C) track renewal are planned to be integrated within the above resignalling schemes. These include in the Portsmouth area:

Havant Junction
Farlington Junction
Cosham Junction
Fratton
Portsmouth and Southsea
Portsmouth Harbour

In the Basingstoke area:
Basingstoke London and Country End Junction
Worting Junction

In the Farnham area:
Farnham
Bentley

Other S&C renewals planned within the timescales of the SWML RUS include:
Woking Country End Junction
Weybridge Country End Junction
Wimbledon
Virginia Water
Effingham Junction
Bournemouth
St Denys

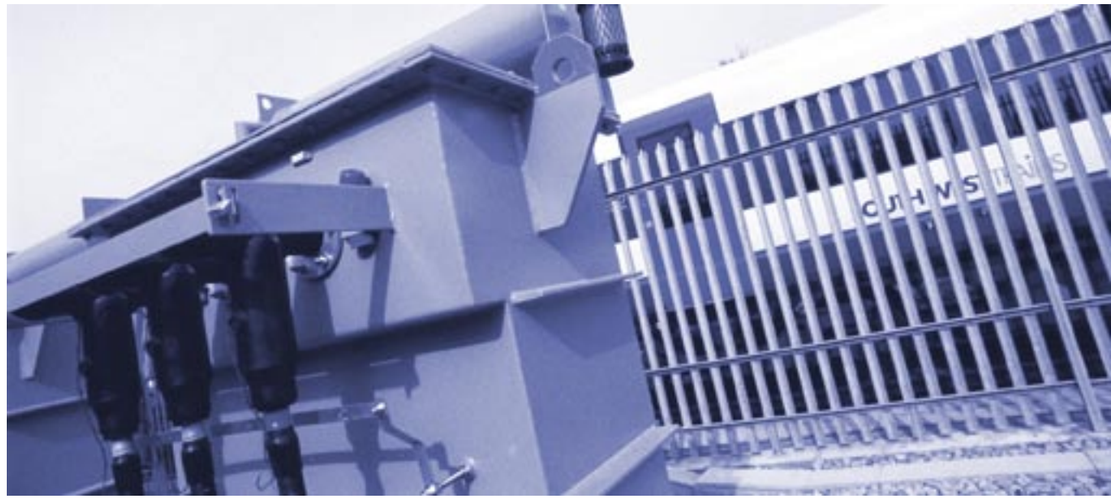
Plain line track on the South West Main Line will continue to be renewed to maintain steady state. Outside the Waterloo to Bournemouth main line the renewal plan concentrates on the continued removal of jointed sections of track and their replacement with continuously welded rail. The plain line renewal volumes average around 25 to 30 miles per year of complete renewal and further significant lengths of component renewal including rail, sleepers, or ballast.

Rolling contact fatigue requires significant management on the route as experience is gained with the wheel/rail interface following the introduction of the new trains. Re-railing volumes will depend upon the outcome of the continual monitoring of the rail condition. Future plans will need to be adjusted to take into account any increase in re-railing if this is found to be necessary.

5.2.6 Other discipline renewals

The Global System for Mobile communications-Railway and Fixed Telecom Network programme is designed to improve railway safety and performance whilst reducing whole-life costs. It will replace most existing railway telecommunications equipment with a new national digital network to international standards. It is expected to be completed within the timescales of the RUS.

The recently completed Power Supply Upgrade allowed new rolling stock to replace the older Mark I slam-door stock that has been a mainstay of the route since the 1950's. Other infrastructure on the South West Main Line route will continue to be renewed to maintain a steady state.



6 Route Specific Gaps and Options

6.1 Introduction

This chapter details how the current position, when considered in conjunction with the predicted changes in passenger and freight demand, results in a number of gaps being created between what the network, services and facilities currently provide and that which is required in the future. The range of options for addressing these gaps is then explored.

In each case an initial assessment of the implications of each option is provided. Ongoing work to analyse the issues in greater detail are identified.

The identified gaps and associated options are summarised in Table 6.2 below.

There is a combination, but undoubtedly a hierarchy, of constraints on the network. It is considered that the most significant individual restrictions on capacity within the SWML RUS area occur within the throat at Waterloo, throughout the multi-track section between Waterloo and Clapham Junction, and at Woking Junction. Options that require the use of additional peak capacity in these areas would clearly be constrained by the intensive use of, and therefore lack of, available capacity.

Passenger use and the performance of the 2005 timetable are currently being studied, but it is evident that the new timetable has delivered improved performance and more peak period services. The key principles underlying this timetable change were the removal of conflicting moves, services on the same lines having the same stopping patterns, service levels that match demand and a dwell time regime that more closely matches reality. In each case these changes are aimed at delivering and sustaining the improvement in performance, as well as catering for passenger demand.

Unless otherwise stated, costs quoted are initial estimates prior to any pre-feasibility work.

All options will be considered in the light of Network Rail's environmental policy during the appraisal process. A copy of Network Rail's environmental policy can be found at http://www.networkrail.co.uk

If you feel there are any unidentified gaps, or alternative options that have not been covered in the following section, then please submit your comments, along with views on funding options, as part of your consultation response.

6.2 Summary table

Gaps	Options
1. The current and future demand shows that there will be overcrowding of the network in the peak period	1.1 Provide additional services 1.2 Train and platform lengthening 1.3 Peak management
2. There is a requirement to review the balance between performance, service level and capacity established by the December 2004 timetable	2.1 Review timetable principles 2.2 Alter stopping patterns and service levels for certain stations
3. There is not enough station car parking capacity at certain locations to satisfy predicted demand	3.1 Increase the capacity of certain car parks
4. Future passenger numbers are forecast to be in excess of passenger capacity at Waterloo	4.1 Short and medium term mitigation measures 4.2 Development of Waterloo station
5. Network capacity constraints do not allow all trains that currently pass through Clapham Junction to call there	5.1 Remodelling of platforms 7 and 8 and associated track at Clapham Junction 5.2 Major remodelling of track and platforms at Clapham Junction
6. There is not enough capacity at Woking Junction to provide the desired mix of service level and punctuality	6.1 Grade separation at Woking Junction 6.2 Timetable change at Woking Junction
7. Freight gauge. The predicted demand for 9'6" container rail freight traffic is expected to grow strongly. The SWML network currently cannot accommodate these containers, without the use of specialist wagons	7.1 Upgrade Reading-Southampton via Winchester and via Andover and Romsey for W10 gauge 7.2 Upgrade Reading-Southampton via Winchester for W10 gauge 7.3 Upgrade Reading-Southampton via Andover and Romsey for W10 gauge 7.4 Utilise specialist wagons to allow 9'6" containers to run on the current network
8. There is an opportunity in the Portsmouth area to improve the balance of services	8.1 Timetable change to alter the service level in the Portsmouth area 8.2 Timetable change to alter platforming arrangements at Portsmouth Harbour 8.3 Infrastructure change at Portsmouth Harbour
9. There is not enough capacity on the West of England Line to provide the level of service aspired to	9.1 Double-tracking the entire West of England line 9.2 Additional passing loops 9.3 Timetable change
10. There is an opportunity in the Southampton area to improve the balance of services	10.1 Timetable change to alter the service level in the Southampton area 10.2 Timetable change to reorganise the overall service level
11. There is not enough capacity at Reading (Platforms 4a and 4b) to provide the required level of service	11.1 Double track the entry to Reading platforms 4a and 4b 11.2 Additional platform at Reading 11.3 Underpass to the 'Relief' side of Reading station

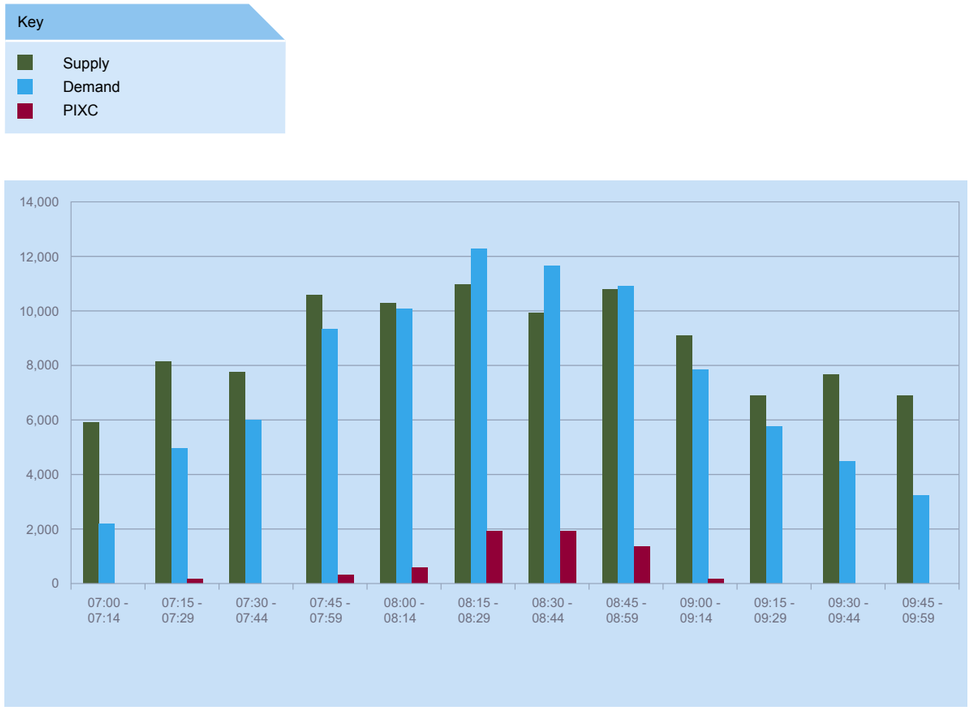
Gap 1: The current and future demand shows that there will be overcrowding of the network in the peak period

Forecasts of passenger growth discussed in Chapter 4 of this document indicate that commuting into central London on the South West Main Line can be expected to grow by about 20% during the period considered by the RUS. This is the central issue that needs to be addressed by the strategy under development.

The analysis of this gap has focussed on the morning peak. Generally, on commuter routes, the evening peak has less concentrated demand than that in the morning, and as a consequence can be satisfactorily served by the morning peak resource base.

Load factors during the peak period are high (as shown in Table M), so the only way to carry significantly more people during this period is to deploy more rolling stock. This could be in the form of additional trains (option 1.1) or longer trains (option 1.2). There may be some scope for some additional or longer trains in the early and late peak periods without incurring infrastructure costs, but during the high peak hour (08:00 to 09:00 arriving at Waterloo) either solution would require significant capital expenditure.

Table M: Distribution of AM Peak Period Demand, Capacity and PIXC – Spring 2005



The data in table M indicates that although there is less capacity provided earlier and later than the high peak hour, overall this capacity exceeds current demand. While a substantial number of people travel outside the high peak, there is capacity for more passengers on many of these services. The concept of peak management (option 1.3) – actions to spread peak demand over a longer time period – will need to be an element of any efficient or practical solution to the issue of growth on the route.

The three principal options for addressing existing overcrowding and the forecast increase in demand – more trains, longer trains and peak management – are initially being analysed separately but will need to be considered together to deliver an optimal solution.

The SWML is only part of a transport system; more than half of the passengers arriving in London on the national rail network continue their journey on public transport. Bus and London Underground routes are available alternatives for passengers using suburban rail services. It is critical that any strategy is developed in conjunction with Transport for London, and thus that a cascade of benefits is delivered.

Option 1.1: Provide additional services

Option	In order to cater for the highest peak flows, additional services would need to be deployed in the high peak hour, arriving at Waterloo between 08:00 and 09:00. The current timetable is constructed on the basis of 2 minute headways and a 5 minute “firebreak” in each half hour, giving a theoretical maximum capacity of 25 identical trains per hour on each of the fast lines, and 3 minute headways on the slow lines, giving a theoretical maximum capacity of 20 identical stopping trains per hour. In practice the trains are not identical so this capacity is not quite reached. Table N below shows the number of arrivals at Waterloo during the morning peak in the current timetable: **Table N: Number of arrivals at Waterloo during the morning peak** This table indicates the possible scope for an increase in a.m. peak services, subject to platform capacity at Waterloo, performance impact, power supply and rolling stock availability. The principal constraint in the high peak hour between 08:00 and 09:00 is the number of platforms at Waterloo – although if more were available then there may be other capacity constraints further down the route – but there is clearly potential to provide additional services before and after the high peak hour.
Timetable Impact	The SWML Railsys model is being used during the consultation period of the RUS to determine the actual scope for incremental peak services (with and without additional platform faces at Waterloo).
Infrastructure Required	In the short term, it may be possible to run additional services in the shoulder peaks without the requirement for infrastructure alterations. In the long term, additional platform faces could be created (either from use of Waterloo International, or by remodelling Waterloo station itself). The specific proposals have not been established or costed and will depend on the selected option for the future use of Waterloo International.
Passenger Capacity Impact	As one example, if the service level provided arriving between 07:00 and 07:59 were the same as for the high peak hour between 08:00 and 08:59, then an additional 18% capacity would be available in this hour.
Business case	The business case will be developed once the Railsys modelling is complete.
Conclusion	Initial investigation indicates that a small number of additional services can be operated in the peak period. This opportunity is constrained by the availability of paths and platforms, the requirement for additional rolling stock, the impact of this load on the electric power supply and the effect of the additional services on performance.

	Fast Lines	Slow Lines	Windsor Lines	Totals
0600 to 0659	4	9	7	20
0700 to 0759	17	17	12	46
0800 to 0859	22	19	15	56
0900 to 0959	17	15	12	44

Option 1.2: Train and platform lengthening

Option	Analysis of the present timetable demonstrates that there is no significant scope for train lengthening in the high peak hour without additional infrastructure (i.e. longer platforms) and that even then the opportunity would be limited to suburban services and constrained by rolling stock availability, adequacy of power supply and platform capacity at Waterloo. Lengthening of key platforms (combined with the appropriate use of selective door opening and some minor adjustment to timetables) on the suburban lines would, subject to the constraints mentioned above, deliver additional high peak capacity. Some shorter services operate before the high peak hour; these could be lengthened without platform lengthening if additional rolling stock were available. A way to achieve considerably higher capacity per train would be to introduce double-deck trains. However, the infrastructure requirements associated with this solution preclude it from consideration within the timescale of this RUS.
Timetable Impact	This option will have minimal impact on the timetable
Infrastructure Required	Certain services before the high peak could be lengthened without any infrastructure changes. A combination of platform lengthening and selective door operation would be required in order to lengthen high peak services. The cost of platform extensions varies from location to location and can range from between £1 million and £12 million per station for two- to four-platform stations.
Passenger Capacity Impact	The conversion of suburban routes, such as the Waterloo to Reading line, from 8-car to 10-car operation would provide a 25% increase in passenger capacity throughout the suburban network, providing capacity for up to 215 additional passengers per service (158 seated and 57 standing).
Business case	Costs and benefits are being identified for this option.
Conclusion	The option to run longer trains in the peak is constrained by the requirement for additional rolling stock, the additional impact of this load on the electric power supply and the need for additional infrastructure such as longer platforms and sidings.

Option 1.3: Peak Management

Option	Within limits, passengers adjust their travel patterns to reflect timetable changes or to secure a faster or more comfortable journey. The limits within which these adjustments are made are determined by both willingness and ability. One way to accommodate growth in demand could be to provide both the motivation and ability to travel earlier or later, thereby flattening the demand profile. To be sustainable such a strategy would need to provide benefits to passengers travelling in the low peak rather than disbenefit to those travelling in the high peak. It would not be a success for this strategy to reduce the number of people commuting into London because most have no practical alternative – they would be lost to the London economy. Providing commuters with the ability to adjust their travel patterns is an initiative that requires the involvement and support of the business community and wider stakeholder groups.
Timetable Impact	This option has no impact on the timetable.
Infrastructure Required	Emerging ticketing technology will provide the opportunity to develop flexible and enforceable commercial products to facilitate the delivery of the option. It is essential that opportunities are not missed in the specification of these technologies through delay in developing a sustainable peak management strategy.
Passenger Capacity Impact	This option on its own would not increase overall passenger capacity, but would aim to provide the opportunity and incentive to people to travel earlier or later than the crowded high peak hour.
Business case	Due to the need for further consultation on this option, no business case has yet been developed.
Conclusion	To be credible and effective the strategy needs to be part of a package of measures to address growth, the objective being to meet overall growth and not to suppress it. The Mayor's Transport Strategy sets the statutory policy framework for transport in London. The integrated nature of transport services in London requires that initiatives to manage demand take a network view, considering the needs of all transport users and the implications for all modes of transport. It is therefore appropriate that peak management initiatives are developed in partnership with TfL and DfT, reflecting the statutory duties involved. Providing commuters with the ability to adjust their travel patterns is an initiative that also requires the involvement and support of the business community and wider stakeholder groups, so during the RUS consultation period there will be a dialogue with many of these bodies and, we intend, directly with passengers.

Gap 2: There is a requirement to review the balance between performance and capacity established by the December 2004 timetable

The timetable change in December 2004 was the most significant change since 1967, and sought to align the timetable with the realities of the modern railway. It changed to accurately reflect the characteristics of modern rolling stock, driving standards and passenger levels. In addition to the changes to the manner in which the timetable was constructed, it sought to reduce the number of conflicting services at key locations, such as at Woking Junction.

The timetable has been a predominant success in terms of performance, and has also allowed a high frequency of peak services. However, it is believed that these changes have restricted the available capacity for further additional services, and some journey times are longer.

The current timetable rules are being analysed and will be adjusted if necessary to ensure the trade-off between performance and network capacity is optimally balanced.

Option 2.1: Review timetable principles

Option	Further changes to build upon the improvements made by the December 2004 timetable should be investigated to establish whether alterations to the rules that contribute to timetable development, such as dwell times and junction margins, would achieve an increase in network capacity while maintaining performance improvements, or further improve performance while maintaining current service levels.
Timetable Impact	Results of the initial timetable investigation are now being modelled using Railsys to provide comprehensive analysis. The output of this study will define any timetable impact associated with this option.
Infrastructure Required	No infrastructure would be required as a result of this option.
Passenger Capacity Impact	Passenger capacity could be increased if changes can be identified which would permit additional trains to run.
Business case	No business case analysis has been carried out on this option.
Conclusion	The restructuring of the timetable in December 2004 sought to address many of the previous timetable driven performance problems, and the resulting performance improvement has shown this to be a success. However, longer dwell times and junction margins lengthen some journey times and limit available capacity, restricting the availability of train paths for extra services. The current timetable rules are being analysed and will be adjusted if necessary to ensure the trade-off between performance and network capacity is optimally balanced.

Option 2.2: Alter stopping patterns and service levels for certain stations	
Option	Where there is a mix of stations on a line with significant differences in usage, adjusting the stopping pattern to reflect this can improve the service provided to the majority of passengers, by providing more journey opportunities for them, reducing their journey times or improving punctuality.
Timetable Impact	No timetable exercise has been carried out on this option, so the impact is not yet known.
Infrastructure Required	No infrastructure would be required as a result of this option.
Passenger Capacity Impact	Whilst total passenger capacity would be unaffected by this option, it would utilise available capacity where there is higher demand.
Business case	The business case will be assessed following consideration of the practicality of changes to the timetable.
Conclusion	Where stations are situated on heavily utilised lines, and are relatively lightly-used when compared with other stations on the line, consideration must be made as to the appropriate level of service provided. A frequent stopping pattern at such a location increases the overall journey time for other passengers, as well as limiting network capacity and reducing opportunities for service recovery in times of disruption. A study to investigate ways to improve the overall stopping pattern is underway.

Gap 3: There is not enough station car parking capacity at certain locations to satisfy predicted demand

Current car parking capacity is not adequate to satisfy predicted demand. Enlarging car parking facilities where there is adequate demand, or encouraging rail-heading, park and ride or connecting bus routes may provide a solution.

Option 3.1: Increase the capacity of certain car parks	
Option	Increase the capacity of car parks where demand is currently greater than supply.
Timetable Impact	There would be no timetable impact as a result of this option.
Infrastructure Required	Alterations to car parks may be required as a result of this option.
Passenger Capacity Impact	Passenger capacity will not be affected as a result of this option, but this option may alter the load profiles of services.
Business case	No business case analysis has been carried out on this option.
Conclusion	Increasing car parking capacity at stations where capacity is being fully utilised will enhance customer facilities and provide for the demand that is known to exist. This option would need to be investigated in conjunction with local authorities to ensure account is taken of local transport policy. The gap between the demand for car parking and the current capacity requires examination, where land ownership permits. Specific stations will be targeted based on current and predicted usage, such as Southampton Airport Parkway, Guildford, Esher, Winchfield and Weybridge which have already been identified as stations with both the demand and available space to investigate car park expansion schemes.

Gap 4: Future passenger numbers are forecast to be in excess of capacity at Waterloo

Waterloo station is now handling a footfall in the region of 85,000 passengers in the peak three hour period. Passenger congestion on the main concourse and the links to and from the London Underground lines are becoming a significant problem at peak times. As outlined in Chapter 4, passenger growth is set to continue and analysis undertaken in the Network Rail capacity study, completed in 2004, shows that progressive removal of existing freestanding concourse retail facilities will be required from 2007 onwards to make room for passengers. From 2012, radical change to passenger facilities at the station will be required to support the anticipated passenger growth.

Without works to accommodate passenger growth, the concourse will suffer from extreme overcrowding and periodic closure as the number of passengers continues to increase. The damage that this overcrowding would cause to performance and the public perception of the railway would be significant, and clearly must be avoided.

Option 4.1: Short and medium term crowding mitigation measures at Waterloo

Option	The removal of retail outlets from the concourse, changing station access and egress arrangements and moving the location of the display screens on the concourse in order to separate passenger movements from those viewing departure and arrival information, would provide short term solutions to the congestion at Waterloo. The project to install ticket barriers between the platforms and concourse at Waterloo will also be completed during this time period. Over the medium term time span of 2012-2020, improving the interchange with London Underground through substantial infrastructure works would provide further mitigation.
Timetable Impact	This option has no impact on the timetable.
Infrastructure Required	In the short-term, the removal of retail outlets, changes to station access and egress arrangements and relocation of the display screens would cost in the region of £10 million. Substantial infrastructure alterations would be required in order to expand and improve the interchange with London Underground and options for this are currently being developed.
Passenger Capacity Impact	The removal of retail outlets, changes to station access and egress arrangements and relocation of the display screens would mitigate against the forecast levels of crowding until 2012. The larger scale proposal for improving interchange with London Underground would provide mitigation until around 2020.
Business case	Initial business case analysis demonstrates that the short-term mitigation proposals are required in order to avoid any worsening of current crowding levels at Waterloo station in the short to medium term. The medium-term mitigation proposals are currently under development.
Conclusion	The short-term mitigation measures are required and plans have been put in place for their implementation. The cost of improving the interchange with London Underground is currently under investigation, and this could also be addressed as part of a larger scale redevelopment of Waterloo station.

Option 4.2: Development of Waterloo station	
Option	The redevelopment of Waterloo station, including platform lengthening, track layout improvements, and the provision of a larger concourse area would provide a long-term solution to the overcrowding at Waterloo, and improve network capacity and performance by facilitating the introduction of longer trains.
Timetable Impact	This option would allow a considerable alteration to the timetable, but no study has yet been carried out, so the details of the potential changes are not yet known.
Infrastructure Required	Substantial infrastructure alterations would be required in order to fully redevelop Waterloo station, which are anticipated to cost in the region of £300 million.
Passenger Capacity Impact	The provision of a larger concourse area combined with improved access and egress and interchange with London Underground, buses and taxis would provide a long term solution for crowding at Waterloo. The provision of longer platforms and a revised track layout on the approaches for the station would support a long term solution to the capacity and performance issues facing the SWML.
Business case	Given the forecast growth in demand, this option is likely to be necessary to provide an appropriate long-term solution for the SWML. However, no specific funding sources have currently been identified.
Conclusion	The major redevelopment of Waterloo station is being considered, and a masterplan proposal is currently under evaluation. This needs to be considered in conjunction with the potential future uses of Waterloo International station since the capacity released by the withdrawal of Eurostar services from Waterloo could be used in the short-term to facilitate a less intrusive construction programme. The importance of Waterloo to the SWML area is such that the nature of the government's chosen option for the future use of Waterloo International will affect the final recommendations related to many of the gaps examined by this RUS.

Gap 5: Network capacity constraints do not allow all trains that currently pass through Clapham Junction to call there.

Transport for London has an aspiration for all SWML services to call at Clapham Junction. The proposal seeks to exploit the interchange potential of what could become a major London hub, and has the merit of reducing total passenger numbers at Waterloo.

Currently all suburban services call at the station, however main line services do not call during approximately 2 hour periods at the height of the morning and evening peaks.

In the morning peak, up services could in theory exploit the advantages of the two platform faces, 7 and 8, which are available to fast line trains. However, a combination of constraints currently precludes this:

- Under present working arrangements it is not safe to dispatch services from platform 8 due to its curvature;
- The use of platform 7 is undesirable given the 15mph speed of the turnouts and the consequent effects such movements could have on the capacity of the fast line; and
- The current signalling system prevents trains from using platforms 7 and 8 simultaneously.

In the evening peak, calling all or calling selective trains at the station would place restrictions on the quantum of trains that could be operated on the fast lines, and the work necessary to understand this relationship is currently underway.

Option 5.1: Remodelling of platforms 7 and 8 and associated track at Clapham Junction

Option	The remodelling of platforms 7 and 8 and their associated track would provide additional capacity at Clapham Junction for Waterloo-bound services. It may also be possible to incorporate a platform extension to allow 12 car services to call at these platforms as part of any works. The solution for services from Waterloo is less clear, but opportunities for timetable changes are being investigated.
Timetable Impact	Initial timetable analysis demonstrates that the remodelling would allow further services to call at Clapham Junction although whether or not this would be sufficient to stop all SWML main line services that currently pass through the station will need to be clarified as the study progresses. The effect in the p.m. peak is being assessed in a parallel exercise.
Infrastructure Required	The a.m. peak element of this option requires infrastructure works to lengthen and straighten platforms 7 and 8 and to remodel the associated track and signalling, with provisional estimates suggesting that this could be delivered at a cost of around £20 million. It may also be possible to incorporate a platform extension to allow 12 car services to call at these platforms as part of any works.
Passenger Capacity Impact	If all main line services were able to call at Clapham Junction in the morning and evening peaks, an increased level of capacity would be provided to the users of this key station. The opportunity to interchange onto Southern and Silverlink services would be enhanced. However, it is anticipated that while this option will facilitate the spread of passengers for Clapham Junction across all services, rather than restricting them to specific services in the peak hours, on-train crowding levels will not be significantly altered. Clapham Junction station is currently suffering crowding problems itself, and increasing the footfall of passengers at Clapham Junction may create a need for enhancements to the station facilities.
Business case	It is proposed that this option be further appraised in order to assess its business case potential.
Conclusion	This option appears to meet a significant proportion of the aspiration to stop all Waterloo services at Clapham Junction. It is therefore recommended for further development.

Option 5.2: Major remodelling of track, platforms and facilities at Clapham Junction

Option	The complete remodelling of track and platform layout at Clapham Junction would provide greater network capacity, and the capability to stop all services at the station if so required. The scheme would also provide much greater flexibility of network capacity and significantly improve operational performance in times of service perturbation. However, the works would involve significant disruption to the operational railway during construction.
Timetable Impact	This option would allow change to the timetable, but no study has yet been carried out as to the extent of this impact.
Infrastructure Required	Infrastructure works to lengthen and straighten platforms, to remodel the track layout on the approaches to the station and to improve the station facilities and access arrangements are required for this option. No appropriate cost estimate can be provided at this time.
Passenger Capacity Impact	Complete remodelling of Clapham Junction would undoubtedly improve network capacity. This key station is currently a capacity constraint in terms of the passage of trains to and from Waterloo, and in the manner in which passengers are able to change from one service to another.
Business case	This option would be massively disruptive to the operation of the SWML. It would take many years to plan and implement. The issue is further complicated by the use of Clapham Junction by Southern, Silverlink, Gatwick Express, Virgin Cross Country, and Freight services, and as such, any proposal would need to satisfy the requirements of all users. No business case has been prepared for this option at this time.
Conclusion	The complete remodelling of track and platform layout at Clapham Junction would provide greater network capacity, and the capability to stop all services at the station if so required. The scheme would also provide much greater flexibility of network capacity and significantly improve operational performance in times of service disruption. The Clapham Junction signalling renewal is at present proposed to take place in 2025 and combining the renewal with any remodelling may provide a more cost effective long-term strategy.

Gap 6: There is not enough capacity at Woking Junction to provide the desired mix of service level and punctuality

The flat junction at Woking is one of the most significant capacity constraints on the South West Main Line. The divergence of the Portsmouth lines from the Main Line to Bournemouth is the cause of a considerable performance and capacity problem. This is due to the high number of conflicting moves, i.e. where one train crosses the track that another train uses.

Option 6.1: Grade separation at Woking Junction	
Option	Grade separation at Woking Junction to carry the Up Portsmouth lines across to the Up Main lines without conflicting with the Down lines is an option to relieve this critical location's capacity and performance problems. In addition to the grade separation, a turnback siding could be positioned to the south of Woking Junction to enable services terminating at Woking to turnback without crossing the Fast lines.
Timetable Impact	A timetable change would be necessary to fully exploit the benefits provided. While this has not yet been modelled, initial analysis suggests that the construction of a grade separated junction would reduce the number of conflicting moves at Woking Junction by 50%. However, the proposed layout potentially introduces other issues such as removal of access to platform 2 from the Portsmouth line, and an increase in occupancy levels on the Up lines.
Infrastructure Required	Construction of a grade separated junction, commencing on the Up Portsmouth Line and joining the Up Main line is estimated to cost in the region of £50m to £100m.
Passenger Capacity Impact	This option may provide a considerable increase in capacity which could be used to reduce overcrowding, further improve performance, and potentially meet future requirements on the route at this key location.
Business case	Details of the benefits that this option would provide are under analysis, although it is anticipated that they will not be adequate to justify the high cost of the infrastructure works.
Conclusion	Further analysis is required in order to quantify the benefits provided by this option and to understand the cost implications.

Option 6.2: Timetable change for services that pass through Woking Junction	
Option	The recent timetable change sought to mitigate the problems at Woking Junction by timetabling Up and Down Portsmouth trains to simultaneously pass each other at the junction, so reducing the number of conflicting moves. Additionally, the stopping service from Guildford to Waterloo via Woking was removed from the timetable to reduce the number of trains crossing Woking Junction. Whilst this has been successful so far in making the network performance more robust, it limits other potential timetable improvements elsewhere on the network by locking the timetable around Woking Junction.
Timetable Impact	A further reduction in service level is not recommended and as the current timetable is designed for optimum performance at Woking Junction there are no options considered for further revision.
Infrastructure Required	No additional infrastructure is required.
Passenger Capacity Impact	Further reductions in service levels through Woking Junction in order to mitigate conflicting moves would have a detrimental impact on crowding levels.
Business case	No business case analysis has been carried out for this option.
Conclusion	The current timetable is locked around Woking Junction in order to maximise capacity and reduce the number of conflicting movements to a minimum. Further reduction in service level would reduce the number of conflicting movements at the expense of train service and passenger capacity, which would widen rather than close many of the gaps faced by the SWML.

Gap 7: The predicted demand for 9’6’’ container rail freight traffic is expected to grow strongly. The SWML network currently cannot accommodate these containers without the use of specialist wagons

The current freight container market is seeing a significant growth in the percentage of ‘high cube’ 9’6” containers, as detailed in sections 3.3 and 4.3. These containers cannot be carried on standard height wagons on most of the network without gauge enhancement, but can be carried with the use of specialist wagons. These wagons have a reduced payload of up to 30%, resulting in inefficiencies and pressure on capacity. This results in a gap between network capability and the requirements of the rail freight market.

There are two possible routes into Southampton from Reading and Basingstoke that could be upgraded to provide W10 gauge capability, one via Winchester, the other via Andover and Romsey.

Option 7.1: Upgrade Southampton-Reading (and beyond) via Winchester and via Andover and Romsey for W10 gauge	
Option	Upgrade Southampton-Reading (and beyond) via Winchester and via Andover and Romsey for W10 gauge, to provide a core route as well as a diversionary route suitable for use when either route is constrained by perturbation or engineering works.
Timetable Impact	This option has no impact on the standard timetable, but allows the possibility to divert freight services when the main route is blocked by an incident or an engineering possession.
Infrastructure Required	The ‘high cube’ 9’6” containers, as detailed in sections 3.3 and 4.3, cannot be carried on standard height wagons on most of the network without gauge enhancement to structures such as bridges, tunnels and platforms. The total cost of upgrading both lines is estimated to be in the region of £90m to £100m.
Passenger Capacity Impact	This option has no direct impact on passenger capacity.
Business case	Preliminary business case analysis has started, and early indications are that there may be a positive business case for some form of W10 gauge clearance works.
Conclusion	Further analysis is required as to the appropriate method of delivering W10 gauge clearance as the works required to complete the upgrade to these routes would involve significant disruption to the network. Whether a diversionary route would provide enough benefit for the additional costs will form part of this analysis.

Option 7.2: Upgrade Southampton-Reading (and beyond) via Winchester for W10 gauge	
Option	Upgrade Southampton-Reading (and beyond) via Basingstoke and Winchester. The main line via Winchester is the shorter route, and has higher line speeds, making it a more logical choice for freight customers.
Timetable Impact	This option has no impact on the timetable, but does not allow the possibility to divert services or change the timetable in future.
Infrastructure Required	The ‘high cube’ 9’6” containers, as detailed in sections 3.3 and 4.3, cannot be carried on standard height wagons on most of the network without gauge enhancement to structures such as bridges, tunnels and platforms. Of particular importance is Southampton tunnel, which would require a major upgrade to allow W10 clearance. The total cost of upgrading this line is estimated to be in the region of £60m to £70m.
Passenger Capacity Impact	This option has no direct impact on passenger capacity.
Business case	Preliminary business case analysis has started, and early indications are that there is a positive business case for some form of W10 gauge clearance works.
Conclusion	Further analysis is required as to the exact method of delivering W10 gauge clearance. The route through Winchester is the shortest and quickest route for freight services. However, the works required to complete the upgrade to this route would involve significant disruption to the network, including the closure of Southampton tunnel for some time. Similar works to upgrade Ipswich tunnel for W10 gauge clearance took 8 weeks.

Option 7.3: Upgrade Southampton-Reading (and beyond) via Andover and Romsey for W10 gauge	
Option	Upgrade Southampton-Reading (and beyond) via Andover and Romsey. The route via Andover and Romsey is longer and slower than the route via Winchester, but is less intensively used and therefore there is likely to be greater available capacity.
Timetable Impact	This option would need to alter the timetable to route W10 gauge traffic via Andover instead of via Winchester as is currently routed.
Infrastructure Required	The 'high cube' 9'6" containers, as detailed in sections 3.3 and 4.3, cannot be carried on standard height wagons on most of the network without gauge enhancement to structures such as bridges, tunnels and platforms. The total cost of upgrading this line is estimated to be in the region of £30m to £40m.
Passenger Capacity Impact	This option has no direct impact on passenger capacity.
Business case	Preliminary business case analysis has started, and early indications are that there is a positive business case for some form of W10 gauge clearance works.
Conclusion	Further analysis is required as to the exact method of delivering W10 gauge clearance. The route via Andover and Romsey is longer and slower than the route via Winchester, but is less intensively used. Whilst the costs of the scheme are expected to be similar to the costs for the Winchester route, the work itself could be done in a less disruptive manner with no major tunnel works, and a less heavily utilised network to upgrade.

Option 7.4: Utilise specialist wagons to allow 9'6" containers to run on the current network	
Option	Do not upgrade the network to W10 gauge but continue the usage of specialist wagons to allow 'high cube' 9'6" containers to run on the current network. If neither route is upgraded then the existing physical and capacity constraints in network capability would remain. These constraints could be overcome with specialist wagons, but these are less efficient.
Timetable Impact	This option has no impact on the timetable, although specialist wagons are permitted to use many more routes than W10 gauge cleared wagons.
Infrastructure Required	No additional infrastructure is required for this option.
Passenger Capacity Impact	This option has no direct impact on passenger capacity.
Business case	No business case analysis has been carried out into this option, although the cost of additional specialist wagons needs to be examined.
Conclusion	Further analysis is required in order to understand the costs to the rail freight industry of running the specialist wagons required to transport 9'6'' containers.

Gap 8: There is an opportunity in the Portsmouth area to improve the balance of services

The performance statistics for the Portsmouth area show a poor level of punctuality with contributory factors including the mix of services operating in the area, services importing delays from a wide range of other areas, empty coaching stock moves to and from Fratton Depot, and complex station workings.

Option 8.1: Altering the service provision to Portsmouth Harbour	
Option	The removal of some services from Portsmouth Harbour may alleviate any performance issues arising from either restrictive platform capacity, or conflicting junction movements before the station.
Timetable Impact	Initial timetable exercises suggest that terminating services that currently serve Portsmouth Harbour at other locations such as Portsmouth and Southsea, Havant and Fareham, would do little to alleviate the issues in the area and in some cases transfer the issues to those other locations.
Infrastructure Required	Additional infrastructure may be required to allow trains to terminate at locations other than Portsmouth Harbour. The infrastructure required varies from location to location and has not been investigated in detail.
Passenger Capacity Impact	Passenger carrying capacity would be reduced as fewer services would continue to run through to Portsmouth Harbour.
Business case	No business case analysis has been carried out into this option.
Conclusion	This option has the risk of reducing the balance of service level against passenger demand. Further, the main alternative terminating points, such as Havant, also have significant constraints that would need to be addressed in order to make this option viable. It is not considered that diverting services away from Portsmouth Harbour would be a positive option, as the demand for services into Portsmouth would remain. The additional costs of works needed to make any other terminating point viable are expected to make this option poor value for money.

Option 8.2: Altering platforming arrangements at Portsmouth Harbour	
Option	Different options are being considered with regards to the best balance of platform utilisation. A reduction in the number of occasions of “top train” workings where one train blocks another between itself and the buffer stops, preventing it from departing the station, and the option to have one platform dedicated to each service group are being analysed.
Timetable Impact	A timetable exercise has been carried out to determine a better method of platforming trains at Portsmouth Harbour. Analysis so far suggests that there are options that would improve the performance of services in the Portsmouth area.
Infrastructure Required	No additional infrastructure is required.
Passenger Capacity Impact	This option has no impact on capacity.
Business case	No business case analysis has been carried out for this option.
Conclusion	There are options to allow each service group in the area a dedicated platform, the reduction in “top-train” workings where one train blocks another between itself and the buffer stops, and the reorganisation of which platform each train waits in to change the length of time they sit idle at Portsmouth Harbour. A mix of these different options is expected to ease performance problems in the area, and further work is underway to determine the timetable changes that may be recommended.

Option 8.3: Infrastructure enhancement at Portsmouth Harbour	
Option	Reinstatement of platform 2 at Portsmouth Harbour would provide increased platform capacity, making it easier to revise the timetable to reduce “top-train” working.
Timetable Impact	The timetable exercise concluded that this option would ease performance problems in the area.
Infrastructure Required	Reinstatement of the track, power supply and signalling for Platform 2 at Portsmouth Harbour. Considerable strengthening of the piers that support the station structure would also need to be carried out. The infrastructure works to complete this option would potentially require the closure of Portsmouth Harbour for a significant period of time, and no appropriate cost estimate for this option can be provided at this time.
Passenger Capacity Impact	This option has little impact on passenger capacity.
Business case	Initial business case analysis suggests that this option will not provide value for money.
Conclusion	The cost of reinstating Platform 2 at Portsmouth Harbour is expected to be prohibitive, and is therefore unlikely to produce a positive business case, particularly given that option 8.2 can provide the necessary performance improvements without the high capital cost.

Gap 9: There is not enough capacity on the West of England Line to provide the level of service aspired to.

The West of England line is severely restricted in available capacity by the long single-line stretches without passing loops. Where there are passing loops, they tend to be in the middle of two long single-line parts of the route. The result of this is a lack of capacity for the provision of additional services. Delay that affects a West of England line service can cause delay to other services on the line and therefore service recovery after an incident is difficult. As the West of England line joins the main line at Basingstoke there is a risk that when delay occurs it can be exported to many other areas of the network.

There are service aspirations from stakeholders for an hourly service from Waterloo to Exeter, supported by an additional hourly local service from Axminster to Exeter. This would provide a half-hourly service between Axminster and Exeter. The current network does not offer sufficient capacity to allow these proposed services to run.

Option 9.1: Double-tracking the entire West of England line	
Option	The redoubling of the entire line to provide a substantial increase in capacity, considerably improve the performance on the line and reduce the propensity to cause knock-on delays elsewhere on the network.
Timetable Impact	The timetable exercise has concluded that double-tracking the entire line would provide significant capacity to run additional services, as well as providing performance benefits.
Infrastructure Required	The double-tracking of approximately 70 miles of track, with associated alterations to bridge structures, platforms and signalling. The cost of these works is expected to be considerably over £100 million.
Passenger Capacity Impact	This option would provide a considerable increase in capacity which could be used to provide additional services.
Business case	Initial business case analysis suggests that this option will not provide value for money.
Conclusion	This option would provide the capacity to allow a considerably more frequent service on the West of England line, but this additional capacity would not allow a more frequent service to London, as the constraints in the Woking and Waterloo areas described earlier in this chapter would also need to be overcome. With approximately 70 miles of double-tracking required, the additional performance and capacity benefits are not expected to provide an adequate return on this significant investment, and as option 9.2 is also expected to provide adequate capacity for additional services, this option will not be analysed further.

Option 9.2: Additional passing loops	
Option	The construction of two new passing loops on the line, one west of Axminster, one east of Pinhoe, would provide the capacity necessary to extend the hourly Waterloo-Yeovil service to Exeter. It would also provide the capacity necessary to allow the hourly service from Axminster to Exeter.
Timetable Impact	The timetable exercise has concluded that the additional services proposed could be robustly timetabled with this option. The additional services would be the extension of the hourly Waterloo-Yeovil service to Exeter and an additional hourly service from Axminster to Exeter.
Infrastructure Required	Approximately eight miles of new track with associated alterations to bridge structures, platforms and signalling. The total cost of this option is currently estimated to be £25m.
Passenger Capacity Impact	This option would provide an increase in capacity which could be used to provide additional services.
Business case	Initial business case analysis suggests that this option will provide value for money.
Conclusion	This option would provide the capacity necessary to provide the proposed service enhancement with a total of 8 miles of additional track. Clearly, this is a more cost-effective means of providing the necessary capacity for service improvements than option 9.1 and as the timetable implications have already been analysed, and the additional services could be robustly pathed with this additional infrastructure it will be examined further. The option could also provide provision for the building of a new station at Cranbrook mentioned in Appendix B.

Option 9.3: Timetable change	
Option	Revise the timetable to allow the identification of sufficient capacity to enable the introduction of additional services.
Timetable Impact	The timetable exercise has demonstrated that there is no capacity for additional services without infrastructure enhancement.
Infrastructure Required	It is assumed that no additional infrastructure is required for this option.
Passenger Capacity Impact	This option could help ease crowding if additional services were provided.
Business case	No business case assessment has been carried out into this option.
Conclusion	The current service is timetabled around the existing passing loops on the West of England line. There is no capacity for extra services without additional passing loops, and as such there is no scope for timetable change to allow additional services.

Gap 10: There is an opportunity in the Southampton area to improve the balance of services

The Southampton area suffers from the highest delay per train of any part of the SWML RUS area. This is the result of a number of factors, in particular, the mix of services using the area, many of which have travelled long-distances over different routes. These include freight, cross-country, commuter and local services.

Option 10.1: Timetable change to reduce the overall level of services	
Option	The removal of some passenger or freight services in the Southampton area is likely to improve performance, by reducing the number of opportunities for delay to affect other services.
Timetable Impact	No timetable study has been carried out into this option.
Infrastructure Required	It is assumed that no additional infrastructure is required for this option.
Passenger Capacity Impact	Passenger capacity is expected to reduce as a result of this option.
Business case	No business case assessment has been carried out into this option.
Conclusion	The removal of some passenger or freight services in the Southampton area is likely to alleviate congestion and improve performance. However, with demand in this area predicted to rise, particularly due to the proposed housing development in the Solent corridor and the continued increase in throughput from the container port, the removal of services could lead to overcrowding and a reduction in the attractiveness of rail transport from Southampton to other areas of the country. This option will not be examined further.

Option 10.2: Timetable change to reorganise the overall service	
Option	The reorganisation of the passenger service pattern in the Southampton area, particularly with regards to the termination points and duplication of some services, especially those with lower passenger demand, should serve to improve performance and operational efficiency.
Timetable Impact	A timetable exercise has been carried out to determine a more robust pattern of services in the Southampton area. Analysis so far suggests that there are a range options that would improve the performance of services, such as combining services and reducing the number of services that terminate at Southampton Central.
Infrastructure Required	No additional infrastructure is required.
Passenger Capacity Impact	Whilst the total number of services in the Southampton area may decrease as a result of this option, the remaining services will be better placed to meet demand, and leaves the potential to increase services on other corridors. Overall this option is expected to have a limited impact on crowding.
Business case	No business case assessment has been carried out into this option.
Conclusion	Timetable options for improving the service pattern in the area have been analysed. It is assumed that the freight, cross-country and mainline services should remain in their current frequency, as they match the forecast demand. The stopping patterns of local services, and the way in which demand at stations in the area is provided for by a variety of service types, requires detailed consideration by way of consultation with the relevant stakeholders. This process has commenced and options for change will be detailed in the final RUS document.

Gap 11: There is not enough capacity at Reading (Platforms 4a and 4b) to provide the required level of service

As a result of the December 2004 timetable change, two trains per hour (out of a total) of six were removed from Reading platforms 4A and 4B, to aid performance in the area. Performance was relatively poor prior to the December change due to the single lead access to the platforms and the mix of stock from different services that use them. The services on this line are extremely busy, and are predicted to experience further growth in demand.

Option 11.1: Double track the entry to Reading platforms 4A/4B	
Option	Works to Vastern Road bridge to allow two tracks to replace the current single lead would involve significant disruption to both rail and road users for an extended period of time. However, platform extensions (see option 1.2) at Reading could be completed in parallel.
Timetable Impact	No timetable exercise has been carried out into this option, but it would provide greater capacity which could be used for additional services, improved performance, or both.
Infrastructure Required	A new bridge span would need to be provided, along with additional track and signalling alterations. Works to Vastern Road bridge to allow two tracks to replace the current single lead would involve significant disruption to both rail and road users. The estimated cost of the construction works is £16m.
Passenger Capacity Impact	The increased capacity could serve to allow the introduction of extra services as well as provide a performance benefit. These extra services would reduce crowding levels on existing services.
Business case	Initial business case analysis suggests that this option should be further considered.
Conclusion	The delivery of this option would be costly and disruptive, but would provide a considerable increase in capacity. It would serve to both increase capacity by allowing services to arrive and depart Reading in parallel, and improve performance as there would be fewer conflicting movements scheduled in the timetable. Platform lengthening at Reading could only be achieved with this option. Further study on this scheme is underway and will examine the costs and benefits associated with the work. The estimated cost of the construction works does not include the costs of the disruption to rail and road users during the construction period.

Option 11.2: Additional platform at Reading

Option	An additional platform at Reading – effectively a ‘platform 4C’ – would provide additional capacity, but this capacity could not be utilised without the double-tracking and bridge works outlined in option 11.1.
Timetable Impact	No timetable exercise has been carried out into this option.
Infrastructure Required	In addition to the new bridge span, track and signalling alterations, a new platform would be constructed.
Passenger Capacity Impact	The increased capacity could serve to provide extra services as well as provide a performance benefit. These extra services would reduce crowding levels on existing services.
Business case	Initial business case analysis suggests that this option should be further considered.
Conclusion	All the works detailed in option 11.1 would need to be carried out in order to construct an additional platform. The incremental cost and benefit of the additional platform will be calculated in parallel with the analysis of option 11.1.

Option 11.3: Underpass to the “Relief” side of Reading station

Option	An underpass to take the SWML lines underneath the Great Western Main Line and onto the Relief lines east of Reading station would provide some flexibility with regards to platform working at Reading. The underpass would be constructed on the track bed of a former underpass which has been disused for some time.
Timetable Impact	No timetable exercise has been carried out into this option, but this option would provide some flexibility with regards to platform working at Reading.
Infrastructure Required	An underpass to take the SWML lines underneath the Great Western Main Line and onto the Down Relief line east of Reading station. New track and signalling would need to be provided along with some alteration to existing structures. The estimated cost of the construction work for this option is £14m.
Passenger Capacity Impact	The impact is expected to be limited, and will depend on whether any additional services can be run as a result of the additional infrastructure. The option could create new cross-Reading journey opportunities.
Business case	Initial business case analysis suggests that this option should be further considered.
Conclusion	The estimated cost of the construction work for this option does not include the cost of the purchase of a small quantity of land that would be required for the route of the underpass, or the disruption caused to rail users during construction. If the new route were to be electrified these costs would rise. If the work could be combined with the renewal of signalling equipment in the Reading area scheduled for 2011, the cost of the option may be able to be reduced. Whilst this option is the cheapest of those examined at Reading, with the shortest and least disruptive construction period, it is significantly less beneficial in terms of performance than the other schemes, and provides little overall extra capacity.

7 Stakeholder consultation

7.1 Introduction

In developing RUSs, Network Rail is working closely with passenger and freight operators, Department for Transport, Scottish Executive, Passenger Transport Executives, Transport for London, Rail Passengers Council, and London Transport Users Committee. Extensive consultation with wider stakeholders is also central to the process.

Wider stakeholder meetings are undertaken at three points in the RUS process.

The first meeting is held early in the process in order to allow wider stakeholders to be briefed on the rail industry agreed scope, the process to deliver the RUS and to allow wider stakeholders to contribute information and raise issues to be considered in the optioneering process.

The second meeting is convened upon completion of the RUS consultation publication to present the findings and recommendations. This is followed by a formal consultation period for stakeholders to review and comment.

Upon completion of the formal consultation process, a further review of the comments received is undertaken prior to the publication of the final document.

A third meeting is held to present the content of the final RUS.

The final document is published and submitted to the Office of Rail Regulation (ORR). ORR may consider the document over a period of 60 days after which the RUS becomes established unless an objection is made.

Such bodies as Local Authorities, County Councils, Unitary Authorities, Regional Development Agencies, and Rail User Groups representatives are invited to the wider stakeholder meetings.

Further meetings are undertaken on a one to one basis, for example with MPs and key rail groups, to ensure that they are fully briefed on the RUS process.

7.2 How you can contribute

We would welcome constructive contributions to assist us in developing each RUS by providing information on regional and local issues, within the key factors listed below. This will help us to identify the gaps between what the railway can do now and what we expect it will need to do in the future. We will publish all RUS information on our website, www.networkrail.co.uk

Key factors which will affect the rail industry in the future:

- Congestion on peak hour trains
- Road congestion at peak times
- Energy prices
- Road Pricing
- Growth areas of employment
- New housing developments
- Environmental considerations
- Population trends

Consultation questions have not been specified, as comments would be welcomed on the content of the document as a whole, and particularly the options in Chapter 6.

7.3 Consultation dates for the SWML RUS

Due to the time constraints relating to the DfT franchise replacement process, the duration of the consultation period will be less than the standard 12 weeks. **The deadline for receiving any correspondence will be Friday 6th January 2006.**

Early responses would be very much appreciated in order to maximise the time available to react and respond in the final RUS document.

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

rus responses@networkrail.co.uk
SWML RUS consultation response
RUS consultation manager
Network Rail
8th Floor
40 Melton Street
London
NW1 2EE

Appendix A: Current service levels

Service levels for each Train Operating Company are detailed in each TOCs Track Access Agreement (TAA) with Network Rail. Copies of TAAs are available from the ORR website at http://www.rail-reg.gov.uk

Planned and actual freight flows within the SWML RUS scope

Section	Direction	Maximum average actuals per day	Maximum actual per day	Maximum planned per day	Average number of trains per hour	Maximum number of trains per hour	Planned number of trains per hour	Proportion of average actuals to planned
Dorchester to Totton (includes Southampton Freightliner terminals and all others west of Southampton)	East	8	8	8	0.4	0.4	0.4	100%
Totton to Dorchester (includes Southampton Freightliner terminals and all others west of Southampton)	West	8	8	8	0.4	0.4	0.4	100%
Northam Junction to St Denys (includes all flows from Eastleigh to Southampton)	North	30	50	47	1.4	2.3	2.1	64%
St Denys to Northam Junction (includes all flows from Southampton to Eastleigh)	South	29	48	47	1.3	2.2	2.1	62%
Eastleigh to Eastleigh East Junction (includes flows to Romsey and London)	North	33	56	53	1.5	2.5	2.4	62%
Eastleigh East Junciton to Eastleigh (includes flows to Romsey and London)	South	33	54	50	1.5	2.5	2.3	66%
Winchester to Wallers Ash Loop	North	25	44	37	1.1	2.0	1.7	68%
Wallers Ash Loop to Winchester	South	25	46	33	1.1	2.1	1.5	76%
Worting Junction (including flows from Ludgershall)	North	4	18	6	0.2	0.8	0.3	67%
Worting Junction (including flows to Ludgershall)	South	3	14	6	0.1	0.6	0.3	50%
Basingstoke to Bramley	North	22	38	32	1.0	1.7	1.5	69%
Bramley to Basingstoke	South	19	34	28	0.9	1.5	1.3	68%

Planned and actual freight flows within the SWML RUS scope (continued)

Section	Direction	Maximum average actuals per day	Maximum actual per day	Maximum planned per day	Average number of trains per hour	Maximum number of trains per hour	Planned number of trains per hour	Proportion of average actuals to planned
Brookwood to Woking Junction	North	7	24	11	0.3	1.1	0.5	64%
Woking Junction to Brookwood	South	9	26	11	0.4	1.2	0.5	82%
Farnham (Holybourne flows)	North	1	1	1	0.0	0.0	0.0	100%
Farnham (Holybourne flows)	South	1	1	1	0.0	0.0	0.0	100%
Virginia Water	North	6	23	10	0.3	1.0	0.5	60%
Virginia Water	South	8	25	10	0.4	1.1	0.5	80%
Chiswick to New Kew Junction (from Clapham Junction and the South London Lines)	North	6	18	19	0.3	0.8	0.9	32%
New Kew Junction to Chiswick (to Clapham Junction and the South London Lines)	South	6	23	17	0.3	1.0	0.8	35%
Kew East Junction to South Acton Junction (to the Midland Mainline, North London Lines and the West Coast Mainline)	North	5	18	14	0.2	0.8	0.6	36%
South Acton Junction to Kew East Junction (from the Midland Mainline, North London Lines and the West Coast Mainline)	South	7	20	16	0.3	0.9	0.7	44%
Chandlers Ford to Romsey	North	8	12	16	0.4	0.5	0.7	50%
Romsey to Chandlers Ford	South	8	8	17	0.4	0.4	0.8	47%
Botley to Eastleigh	North	2	2	2	0.1	0.1	0.1	100%
Eastleigh to Botley	South	2	2	2	0.1	0.1	0.1	100%

Appendix B: Stakeholder proposals

B: Stakeholder proposals

This appendix contains details of a number of significant enhancement aspirations of which Network Rail is aware. These aspirations will not be individually assessed in this consultation document, but ultimately their fit with the final SWML Route Utilisation Strategy must be considered by the proposers. A sensitivity test may be undertaken before publication of the final strategy in certain circumstances to assess the potential impact of the proposal. The list below is not intended to be a comprehensive catalogue of all stakeholder aspirations, and contains only those proposals that have been developed beyond outline concept.

New station proposals:

Reading Green Park
A proposed new station on the Basingstoke to Reading line, between Bramley and Reading West with an interchange just off the M4 south of Reading incorporating links to a new housing estate and existing commercial developments.

Chineham
A proposed new station on the Basingstoke to Reading line, between Basingstoke and Mortimer.

Cranbrook, east Devon
A proposed new station on the West of England line, between Whimple and Pinhoe. This is the location of a possible new area of housing, and is also close to Exeter Airport.

East of Andover
A proposed new station to the east of Andover, between Andover and Whitchurch, linked to a possible new housing development.

Farlington
A proposed new station to the east of Farlington Junction (between Cosham and Bedhampton), close to the A27 and the large areas of housing in Farlington and Drayton.

Other schemes:

Airtrack
Airtrack is a major rail initiative designed to provide improved access to Heathrow from the south, with new direct links to the airport from South London and important centres such as Guildford, Woking and Reading.

Airtrack would comprise three sets of services operating to Terminal Five at Heathrow Airport from Waterloo, Guildford and Reading.

South Hants Rapid Transit (SHRT)
SHRT is a proposed light rail system connecting Fareham with Portsmouth via a tunnel from Gosport to Portsmouth. Further phases of the SHRT development are also proposed, extending to Southampton, Waterlooville and Horndean. Further details are available from the Hampshire County Council website at http://www.hants.gov.uk/lrt/

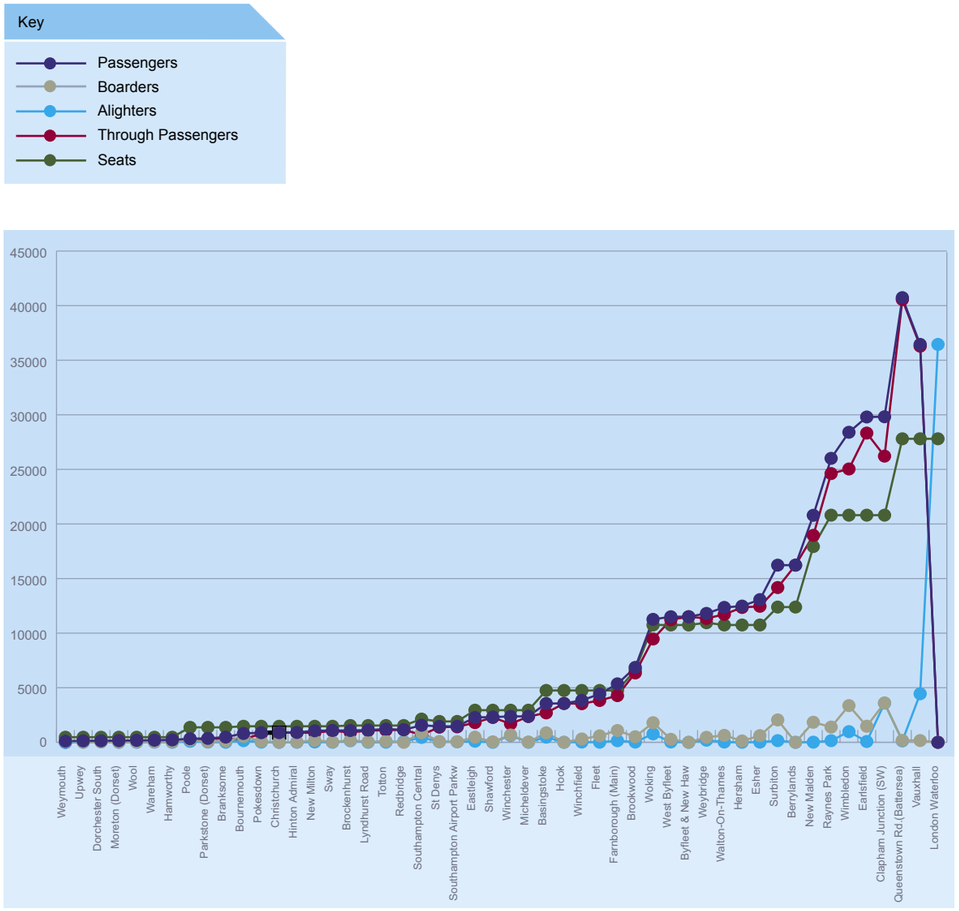
Swanage
The Swanage Railway currently runs heritage trains from Swanage to Norden. There are aspirations to restore a through service from Swanage to Wareham.

Appendix C: List of Consultees

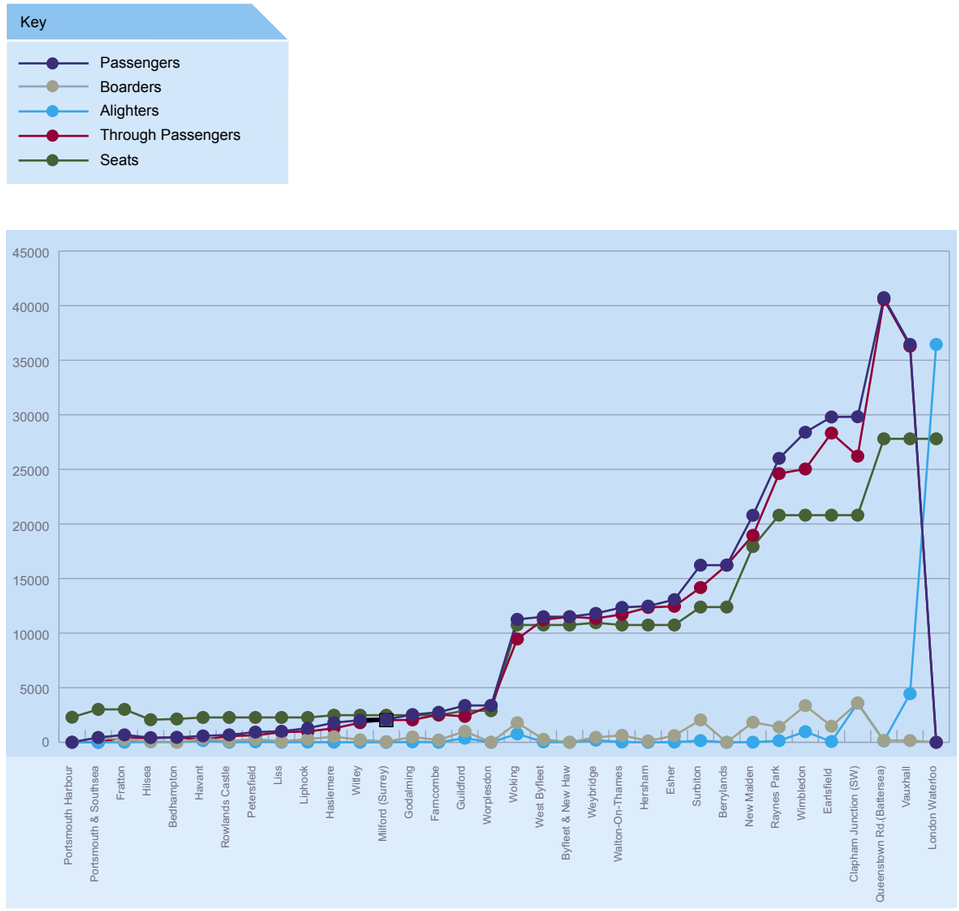
Alton Line Users' Association
Association of Train Operating Companies
Basingstoke and Dean Borough Council
Bournemouth Borough Council
Bracknell Forest Borough Council
British Airports Authority
Confederation of British Industry South West
Charmouth Parish Council
Christchurch Borough Council
Crewkerne Town Council
Department for Transport
Devon County Council
Dorset County Council
East Devon District Council
East Dorset District Council
East Hampshire District Council
Eastleigh Borough Council
Elmbridge Borough Council
English, Welsh and Scottish Limited
Eurostar
Exeter City Council
Fareham Borough Council
First Group
Freightliner Limited
GB Railfreight Limited
Greater London Authority
Guilford Borough Council
Hampshire County Council
Hart District Council
Havant Borough Council
Health and Safety Executive
Honiton Town Council
London Borough of Hounslow
London Borough of Kingston upon Thames
London Borough of Lambeth
London Borough of Merton
London Borough of Richmond
London Borough of Southwark
London Borough of Sutton
London Borough of Wandsworth
London Development Agency
London Transport Users Committee
Mole Valley District Council
New Forest District Council
North Dorset District Road Council
Office of Rail Regulation
Poole Borough Council
Portsmouth City Council
Purbeck District Council
Rail Freight Group
Rail Freight Operators' Association
Rail Passengers Council
Reading Borough Council
Reigate and Banstead District Council
Rushmoor Borough Council
Salisbury District Council
Slough Borough Council
South East England Development Agency
South East England Regional Assembly
South West England Development Agency
South West Regional Assembly
South West Trains
Southampton City Council
Southern Railway
Spelthorne Borough Council
Surrey County Council
Surrey Health District Council
Teignbridge District Council
Test Valley Borough Council
Transport for London
Virgin Trains
Waverly District Council
Wessex Trains
West Dorset District Council
Westminster City Council
Weymouth and Portland Borough Council
Wiltshire County Council
Winchester City Council
Windsor and Maidenhead District Council
Woking Borough Council
Wokingham District Council
Yeovil Town Council

Appendix D: Load profiles

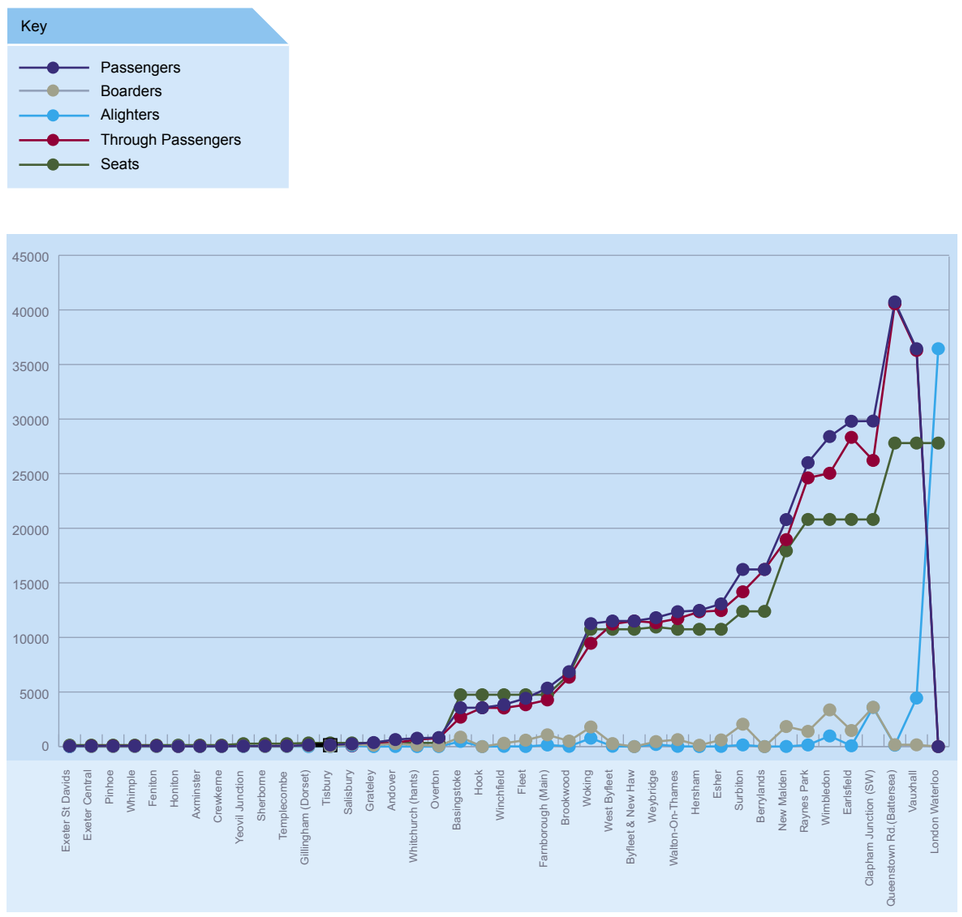
Weymouth – Waterloo



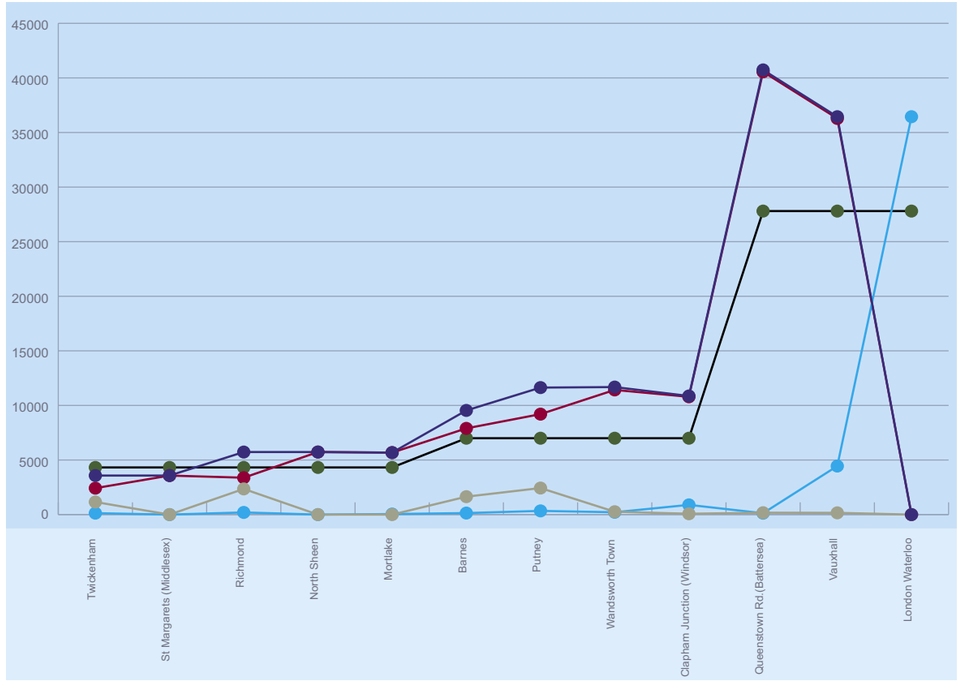
Portsmouth Harbour – Waterloo



Exeter – Waterloo



Twickenham – Waterloo



Appendix E: Glossary of Terms

Access Charge Review of 2003	A review of Network Rail's funding requirements for the operations, maintenance and renewal of the rail network undertaken by the Office of Rail Regulation. This establishes the level of track access charges that are paid for a five year period, along with the associated output commitments that are expected at this level of funding
Base occupancy	The percentage of time that a signal section is occupied by a train
Desiro	South West Trains modern class 444 and 450 units that have replaced the Mark I stock
DfT	Department for Transport
Down lines	Generally, tracks for services travelling away from London
Dwell time	The time a train is stationary at a station
Efficient Engineering Access	A generic term for an initiative aimed at establishing a more efficient access regime for the delivery of the required maintenance and renewal of the railway infrastructure, balancing engineering requirements with passenger and freight demand
EWS	English, Welsh and Scottish Railway
FOC	Freight Operating Company
FRUS	Freight Route Utilisation Strategy
FTN	Fixed Telecom Network
GSM-R	Global System for Mobile communications – Railways
Headway	The minimum interval possible between trains on a particular section of track
HLOS	High Level Output Specification
Junction margin	The minimum interval possible between trains operating over the same junction in conflicting directions
Load factor	The amount of seats occupied on a train service expressed as a percentage of total seats available
Loading gauge	Maximum dimensions to which a vehicle can be built or loaded without being at risk of striking a lineside structure
Mark I	The slam-door trains that have been replaced

MOD	Ministry of Defence
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
PIXC	Passengers In Excess of Capacity
Possession	Where part of the infrastructure is closed to services to carry out maintenance, renewal or enhancement works
PPM	Public Performance Measure
PPP	Public Private Partnership
PSU	Power Supply Upgrade
PTE	Passenger Transport Executive
RPC	Rail Passengers' Council
Railsys	A modelling tool used to measure performance
RCP	Rail Corridor Plan
RFG	Rail Freight Group
RPA	Regional Planning Assessment
RUS	Route Utilisation Strategy
S&C	Switch and Crossings
SHRT	South Hants Rapid Transit
SRA	Strategic Rail Authority
SWML	South West Main Line
SWT	South West Trains
TAA	Track Access Agreement
TEU	Twenty foot Equivalent Unit
TfL	Transport for London
TOC	Train Operating Company
Train path	A slot in a timetable for running an individual train
Up lines	Generally, tracks used by services travelling to London
WCML	West Coast Main Line

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