ANNEX A – THE SWLEP RAIL NETWORK

Swindon & Wiltshire LOCAL ENTERPRISE PARTNERSHIP

SYSTRA

Swindon Borough Council

Wiltshire Council Where everybody matters

SLC Rail

SWINDON AND WILTSHIRE RAIL STUDY

ANNEX A – THE SWLEP RAIL NETWORK

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1. SWINDON AND WILTSHIRE RAIL NETWORK

1.1 Introduction

1.1.1 The Swindon & Wiltshire LEP area enjoys a strong position on the rail network, supporting both long distance and regional connectivity. The area is primarily served by three east-west routes, all providing access to London and the West of England / South Wales; these routes are dominated by long distance high speed services, albeit at varying speeds and frequency. These three routes are linked by the Trans Wilts corridor, which has a very different character, supporting local and regional connectivity, linking the principal towns of the area and providing wider access to key regional centres such as Bristol, Swindon, Bath and Southampton.

1.1.2 Although the railway has strengths which can help the SWLEP area capitalise on its position, however, there are a number of areas where services can be cost-effectively improved, and many opportunities to enhance access to the network for residents and businesses alike. Understanding where improvement can be made and developing these can help to promote a synergistic relationship between development of the rail network and the area it serves.

1.1.3 The remainder of this chapter describes the rail network, the service it offers, and its operational strengths and weaknesses within its current form to provide a baseline understanding of the network that the SWLEP will seek to develop in the future. It should be read in conjunction with Annex B which describes the role of rail in Wiltshire.

1.2 The Wiltshire Rail Network

1.2.1 The rail network in Wiltshire is characterised by three east-west mainlines, joined by a single north–south route. These four routes comprise:

- Great Western Main Line (GWML): London Paddington – Bristol/South Wales via Reading and Swindon and London Paddington – Cheltenham Spa via Swindon and Gloucester
- Berks & Hants Line (B&H): London Paddington – Exeter/Paignton/Plymouth/Penzance via Reading and Westbury
- West of England Line (WoE): London Waterloo – Exeter St. David's via Salisbury
- Trans Wilts / Wessex Line (TW): Bristol/Swindon – Southampton/Portsmouth/ Weymouth via Trowbridge, Westbury and Salisbury

1.2.2 The GWML and the B&H routes are both major mainline routes characterised by high speed services linking major centres. This is both a strength and weakness for Swindon and Wiltshire; at Chippenham and Swindon it is very clearly a strength as it provides both centres with high speed and frequent links to London and Bristol (and South Wales in the case of Swindon), but represents a weakness on the B&H Line, where the focus has historically been on providing high speed links to Exeter, Plymouth and the South West. The result of this is a poor service frequency at the Wiltshire stations of Westbury and Pewsey, and little connectivity with Bedwyn, where services are almost exclusively to Newbury, Reading and London except for a handful of early morning and evening departures.

1.2.3 This dominance of long distance high speed services on the GWML and B&H has been a historic frustration to attempts to improve local accessibility to the rail network through the opening of stations.

1.2.4 The West of England line historically competed with the B&H route to provide links between London and the South West. Since the 1960s, however, the route has focussed on linking Dorset and South Wiltshire / Salisbury to Woking and London. Services on this route are characterised by slower services than on the GWML and B&H routes, however they do provide a consistent level of service at smaller intermediate stations.

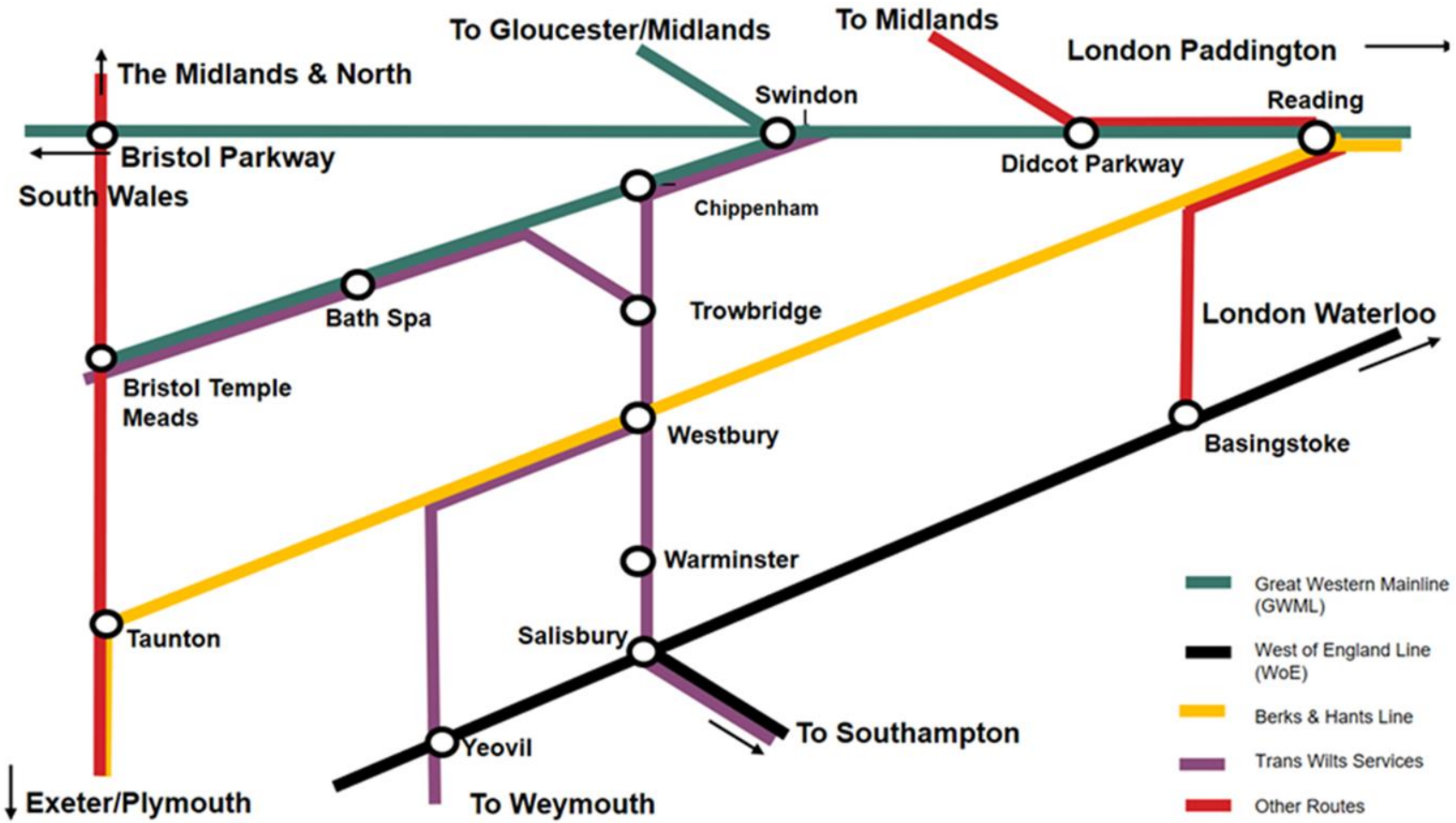
1.2.5 The Trans Wilts is very different in character from the other routes. As well as being the only north-south route, it is also characterised by a focus on regional and local services with a higher density of stations and a diverse mixture of services forming a network focussed on Westbury and Trowbridge. The route has seen significant growth in recent years, but further development of both services and connectivity has been limited by its interactions with the east-west routes described above.

1.2.6 The railway geography described above means that passenger from most of the smaller stations in Wiltshire have to rely on connecting journeys for travel outside the county, and in particular, travel to the key economic centres of London and the Midlands. These connections are made from the Trans Wilts to the GWML, B&H and WoE at the key hubs of Swindon, Westbury and Salisbury.

1.2.7 An example of this can be seen in access to London. Warminster and Trowbridge are the two largest rail served towns in Wiltshire without regular trains to London. Both are served by irregular (and off peak) services to via Salisbury to London Waterloo, however the most regular options is to interchange, at Salisbury in the case of Warminster or Bath Spa in the case of Trowbridge. However faster options in terms of journey time are available via Westbury (for Warminster) or Chippenham (for Trowbridge), however service frequency via these options are more irregular. In combination passengers are presented across the day with a range of journey times and routing options. This reflects a typical pattern for passengers travelling further afield from the Trans Wilts route.

1.2.8 In the following sections we describe the routes and their services and connectivity in more detail. The figure below presents a summary of the geography of the SWLEP rail network and the four main routes.

Figure 1. Wiltshire Rail Network (showing key stations only)



2. GREAT WESTERN MAIN LINE

2.1 Existing Passenger Services

2.1.1 The main function of the passenger service on the GWML is to provide high speed long distance services linking London with Bristol and South Wales. The core service operating on the route through Wiltshire is formed of up to five trains per hour in each direction, operated by Great Western Railway (GWR) as follows:

- 1 train per hour London Paddington – Swansea
- 1 train per hour London Paddington – Cardiff
- 2 trains per hour London Paddington – Bristol Temple Meads
- 0.5 trains per hour London Paddington – Cheltenham Spa

2.1.2 All these services call at Swindon, providing up to five train per hour between Swindon, Reading and London plus links to Cheltenham, Cardiff and Swansea. Both Bristol – London services also call at Chippenham, providing two trains per hour to London, Bristol and Bath Spa.

2.1.3 Although the service from London to Cheltenham only operates every two hours, it is supplemented by a Swindon – Cheltenham service to provide an hourly service on the South Cotswolds Line linking Swindon with Kemble, Stroud, Stonehouse, Gloucester and Cheltenham. Thse trains provide Swindon's only direct northbound service, giving access to the Midlands via same-platform interchange at Cheltenham Spa.

2.1.4 Whilst the above represents the core service pattern, there are a number of extensions to other destinations. On the Paddington – Bristol corridor, one service per day extends to Penzance and seven services extend to Weston-super-Mare, two of which are extended to Taunton and one to Exeter. On the South Wales route, one service per day extends beyond Swansea to Carmarthen. The majority of these service extensions are in the morning and evening peaks to provide direct links from points further west to London; only Weston-super-Mare has direct services to London across the day.

2.1.5 All of these services have high average speeds; for example, London – Swindon has an average speed of 75mph. This is however achieved by services having a very limited number of intermediate stops; for example over the 76 miles from Reading to Bristol Parkway services make a maximum of two stops at Didcot Parkway and Swindon, with Swindon being the only intermediate station between Didcot Parkway and Bristol Parkway.

2.1.6 This service structure has existed for a number of years, but will be revised significantly in December 2019 following the completion of the electrification works on the route and the introductions of new InterCity Express Trains (IET).

2.1.7 Interchange between services is variable. At Swindon connections towards the South Cotswolds Line to Gloucester and Cheltenham operate only hourly, with some larger gaps, for example in the early evening peak period. Indeed for travel north of Cheltenham it is often quicker to travel via Bristol Pakway. Connections to the Trans Wilts network are also variable with the Swindon – Westbury service only operating at an approximately two hourly frequency, meaning it is often quicker to travel via Bath to access stations such as Trowbridge.

Similarly connections towards Oxford at Didcot Parkway can also be variable with some very good journey times achievable but at other times long waits are required at Didcot Parkway.

2.2 Freight Traffic

2.2.1 The GWML is used by a diverse range of freight traffic. An analysis of a typical weekday suggests that there are approaching 40 freight movements passing through Swindon station. These trains represent a conflict with passenger services in the area as the freight trains accelerate slowly to a maximum speed of either 60mph or 75mph, compared with the fast acceleration to 125mph of most passenger services using the route. In combination this represents a capacity constraint on developing the route further.

2.2.2 The majority of freight traffic using the line passes through the SWLEP area rather than serving it. This main exception to this is a stone terminal at Royal Wootton Bassett, which receives services from Merehead Quarry in Somerset.

2.2.3 The main groups of flows that operate on the route are:

- Container trains linking ports at Southampton, London Gateway and Tilbury with container terminals at Bristol and Wentloog (South Wales).
- Petroleum trains linking refineries in South Wales with inland terminals such as Theale
- Aggregate trains from the Somerset quarries to Wootton Bassett and destinations in the Midlands
- Household waste trains linking London and Avonmouth
- Occasional services run for the Ministry of Defence linking depots at Ashchurch, Bicester and Ludgershall.
- Car traffic has in the past operated from the Honda plant at Swindon.
- Cement products via the Tarmac plant at Westbury

2.2.4 The GWML has not received significant gauge enhancement works, and much of the line is cleared only to W6A or W7 gauge. This has an impact on the development of intermodal and container traffic markets. The current gauge does not permit the largest shipping containers to be moved by rail along the route without the use of inefficient “pocket” wagons. At the current time this does not impact on any flows starting or terminating within Wiltshire.

2.3 Infrastructure & Constraints

2.3.1 The GWML is one the key rail routes in the UK, and like many parts of the railway increasingly suffers from capacity constraints. Between London Paddington and Didcot Parkway the railway is four track, allowing segregation between fast (typically long distance passenger services) and slow (typically local passenger and freight) services. Whilst this provides a high level of capacity, it is matched by the volume of services operated; in a typical off-peak hour 14 trains run each way between London and Reading, with 11 passenger trains running each way between Reading and Didcot Parkway. There are also paths for up to three freight trains in each direction per hour. The route between Didcot and Bristol is signalled to operate with a headway of four minutes giving a theoretical service frequency of 15 trains per hour, however the combination of service services and the need to timetable trains across junctions means that the practical capacity is much lower than this.

2.3.2 One of the strengths of the route is its relatively straight alignment, which allows services to operate at a high speed. The maximum line speed of the route between London and Bristol is 125mph, and substantial proportions of the route operate at this speed, which is currently the maximum speed of conventional railways in the UK.

2.3.3 Network Rail developed a Route Study for the Western Route in 2015 and identified the following capacity constraints on the GWML that may limit the development of services.

Network Rail Western Route Study:

The Network Rail Western Route Study (2015) identifies the following capacity constraints between London and Bristol:

- Paddington – Airport Junction; junction, line and station capacity
- Platform capacity at Reading in the long term
- Line capacity between Didcot Parkway and Bristol Parkway
- Crossing movements at Foxhall Junction (west of Didcot) where the route merges from four to two lines
- Swindon station line and platform capacity (including Wootton Bassett Junction)
- Bristol East Junction capacity (approach to the station from Bristol Parkway and Bath)

2.3.4 The station at Reading has been successfully remodelled in recent years to provide additional capacity and, in particular, grade separation at the west end has greatly reduced the number of conflicting movements between services.

2.3.5 West of Didcot Parkway the railway is reduced to a two track formation, typically used by up to five long distance high speed service per hour in each direction as far as Swindon, with four continuing east of Swindon; this will be increasing to seven trains per hour in each direction when new electric services to Bristol start running. In addition there is provision for up to three freight trains per hour in each direction.

2.3.6 To accommodate this level of service, loop lines for freight trains are provided at Steventon (east of Didcot) and there is a quadrupled section of line for four miles between Wantage Road and Challow. The infrastructure between Didcot and Wootton Bassett Junction (west of Swindon) was rationalised in the 1960s and 1970s with a focus on providing a high speed route with some capacity for freight trains; this rationalisation has significantly limited the scope for developing new services and stations, indeed the closure of intermediate stations and the removal of their associated stopping trains facilitated the rationalised infrastructure which exists today. As described elsewhere in this report there have been ambitions to introduce new services calling at a number of reinstated intermediate stations, however the number and speed of the existing services, coupled to the limitations of the infrastructure, means that it is difficult to provide such services without a significant investment in track and signalling infrastructure in addition to the cost of the station facilities.

2.3.7 To the west of Swindon, Wootton Bassett Junction represents a major capacity constraint. The junction is the point at which London – Bristol services diverge from London – South Wales services. The junction has to cope with between eight and ten passenger movements per hour plus a number of freight movements. Whilst this is not a large absolute number of movements it is difficult to alter and amend the timing of services to accommodate additional

trains, as the timing of long distance trains is determined by issues along the length of the route from South Wales and Bristol through to London.

2.3.8 Between Wootton Bassett Junction and Bristol Temple Meads lie two junctions at Thingley and Bathampton. Thingley Junction provides access to the WL route to Westbury via Melksham. At present this junction does not represent a significant issue to GWML services, as only around one train every two hours operates via Melksham in each direction. Bathampton Junction in contrast is more of a constraint on the planning of services, with the two London – Bristol services being joined at this location by a minimum of two services per hour from Westbury, giving a total of between four and five passenger services each hour between Bathampton Junction and Bristol, of which one calls at intermediate stations on the route. As with Wootton Bassett junction, although the volume of trains is not great, three of the four trains per hour in each direction are long distance services so amending the timing of these services is complex.

2.4 Great Western Electrification Programme

2.4.1 Over the last few years the GWML has been undergoing a modernisation and upgrade programme designed to increase and capacity and capability of the route. This is the first major upgrade work that the route has seen since the introduction of High Speed Trains in the 1970s. As well as the major scheme to modernise and increase the capacity of Reading station the main output of the scheme was to be the full electrification of the route from London to Bristol and South Wales. However due to rising costs the scope was amended to provide partial electrification, with overhead wires being provided between London, Bristol Parkway and Cardiff, and London and Thingley Junction. Of relevance to Wiltshire this leaves the following sections unelectrified:

- Thingley Junction – Bristol Temple Meads via Bath
- Bristol Parkway – Bristol Temple Meads

2.4.2 To provide through services, GWR have acquired a fleet of Bi-mode IET trains to operate services. These are capable of operating on either diesel or electric traction, and have entered fleet service on the route during 2018. Whilst the new trains have the same maximum speed (125mph) of the 40 year old High Speed Trains (HSTs) they replace, they benefit from superior acceleration at lower speed, particularly when running on electric power, bringing the potential for journey time reductions.

2.5 Committed Service and Rolling Stock Changes

2.5.1 On completion of the Great Western Electrification Programme (GWEP) a new timetable will be introduced which will take advantage of the new rolling stock being introduced on the route and also provide two new express services. The key changes which will be delivered in December 2019 are:

- Operation of a new two train per hour service between Bristol Temple Meads and London Paddington calling at Bristol Parkway only
- Increase in the frequency of the London Paddington – Cheltenham service from two hourly to hourly, and withdrawal of the existing Swindon – Cheltenham service

2.5.2 The new Bristol – London service will be the flagship service for the Great Western route, and will reduce typical journey times from London to Bristol from 105 minutes to 90 minutes. In addition, in the peak periods, a service of three trains per hour will operate from Bristol to London via Bath. Whilst this new service will provide additional capacity between London and Bristol, it will place increased pressure on line capacity and on the key junctions, at Bathampton and Wootton Bassett.

2.5.3 As mentioned above the rolling stock providing long distance high speed services will be entirely replaced by new IET trains providing a significant increase in both capacity and quality of accommodation for passengers from Chippenham and Swindon towards Bristol, the Thames Valley and London.

2.6 Long Term Service Opportunities

2.6.1 Although this study is focussed on identifying how the network should be developed to meet the SWLEP objectives it is worth considering how the rail industry sees services developing in the long term. The Network Rail Western Route study, examines the future of the route until 2043, a number of new services are identified for the route designed to deliver the connectivity and capacity required to meet demand, these may complement and support the aspirations of the SWLEP. These include the following ADDITIONAL services on the route:

- 1 train per hour London – Gloucester
- 2 trains per hour London – Cardiff/Swansea
- 1 train per hour East of England/East Midlands – Bristol via East West rail and Oxford
- 1 train per hour Swindon – Westbury
- 1 train per hour Swindon – Worcester and the north
- 2 trains per hour semi-fast London – Swindon

2.6.2 Clearly the development of these services will depend on future growth and investment opportunities, however they would represent a substantial uplift in connectivity with up to four trains per hour to South Wales and up to three trains per hour on the South Cotswold Line.

3. GREAT WESTERN: BERKS & HANTS ROUTE

3.1 Existing Passenger Services

3.1.1 The B&H route has a different character and service pattern to the GWML running to the north. In particular, the line has lower line speeds, determined by the curvature of the route, so to maintain journey times for long distance services between London and the West Country the number of intermediate calls is reduced, impacting significantly on the service provided to stations in Wiltshire.

3.1.2 At the time of writing the route is served by the following core service:

- 1 train per hour London Paddington – Bedwyn calling at all stations between Reading and Bedwyn
- 1 train per hour London Paddington – Plymouth (with alternate services extending to Penzance
- 6 additional services per day operating to Paignton, Exeter, Taunton or Frome that supplement the above services

3.1.3 The service provided to stations in Wiltshire on this route is very limited relative to the number of trains operated. Bedwyn station has the best service in terms of frequency with an hourly service to London although journey times are constrained by the number of stops the service makes with journey times of around 1 h 15 minutes. West of Bedwyn there are only two station served by the B&H in Wiltshire, although the station at Frome acts as a railhead for parts of West Wiltshire.

3.1.4 The station at Pewsey receives a service of only ten trains to London with significant gaps between services in the off peak period for example there is a gap of around 3.5 hours between services at 10:18 and 13:45.

3.1.5 The situation is similar at Westbury which receives only 11 services per day from London via the B&H route. Despite its location as a junction on the rail network the route Westbury has historically received a poor service from London, as services to the South West can use an avoiding line around the town which is much quicker than serving the station. Similarly Frome receives only two trains per day from London as it is also has an avoiding line around the town.

3.1.6 Of the 9 services that run to the west from Westbury, all travel as far as Taunton with 8 continuing to Exeter, 3 to Paignton, 3 to Plymouth and 1 to Penzance.

3.1.7 Of the four groups of routes that form the rail network in Wiltshire the B&H provides the poorest services to the stations within Wiltshire. In particular, the stopping pattern of services at Westbury on the B&H means that connections to London and the West Country at this potentially key interchange hub are irregular, despite the frequent Trans Wilts services, giving travellers a confusing range of options and significant variations in journey time for longer-distance connecting journeys.

3.2 Freight Traffic

3.2.1 The B&H route has a critical role to play in the distribution of aggregate traffic from a number of quarries in Somerset. The quarries at Whatley and Merehead generate very significant tonnages of stone which are distributed by rail. Whilst the quarries themselves are located in Somerset, the railway operational centre for these flows is Westbury, where wagon and locomotive stabling and train crew facilities exist.

3.2.2 The volume of traffic generated by the quarries varies on a daily basis, however on a typical September weekday each quarry had 8 departures, a total of 16 departures, which with arrivals represents a total of 32 movements across the day. The timings of these departures and arrivals also varies from day to day.

3.2.3 These trains have a broad range of destinations although the main flows are to the London area with services terminating at Acton, Dagenham and Hayes; other destinations include Oxford and Avonmouth. The volume of this traffic places significant pressure on the capacity of the B&H Line, and complicates the planning of passengers services as the stone trains cannot travel at more than 60mph, complicated further by the inevitably slow acceleration of trains that can weigh in excess of 3,000 tons.

3.2.4 In addition to stone trains from Whatley and Merehead there are a small number of other freight services to and from the Exeter area. The route is also used as a diversionary route when the GWML is closed for engineering work.

3.2.5 Like the GWML the route is gauge cleared to W6A or W7 gauge allowing some but not all shipping containers to be moved by rail along the route. At the present time this is not a significant issue as the route is principally used by this type of traffic as a diversionary route and there are no traffic flows of this type originating on the route.

3.3 Infrastructure & Constraints

3.3.1 The B&H route diverges from the GWML at Reading and is a double track line for its entire length. Historically the line has been limited by the curvature of the route, limiting the maximum speed of services, indeed the line only achieves a maximum speed of 100mph (constraining journey times to Exeter and beyond), in contrast to the GWML where substantial sections of the route can achieve 125mph. This was also an issue historically and in an attempt to mitigate the issue bypass lines (or avoiding lines) were constructed at Frome and Westbury to allow provide faster journey times to the South West. One of the long term impacts of this investment has been issues with poor service frequency from these stations towards London, as historically the benefits of the journey time savings achieved by the bypass lines are greater than the revenue benefits of providing Westbury and Frome with links to the South West or London; this perspective may change with an increase in service frequency.

3.3.2 The route is currently signalled with a headway of five minutes on the central section between Reading and Westbury, giving a theoretical capacity of 12 trains per hour, however this is complicated in practice by the mixture of stopping patterns and average speeds of the long distance, local and freight trains that use the route.

3.3.3 As described in the sections above, the route serves a mixture of long distance high speed services, Thames Valley suburban services and freight traffic. The impact of this is that although the volume of trains operating is not as intense on other routes, the mixture of speed and performance profiles on the route is such that the route can be capacity constrained.

3.3.4 Passing loops that trains (especially freight trains) could recess in to allow other services to overtake are found at Theale, Newbury, Hungerford (westbound only), Woodborough, Westbury and Frome between Reading and the Somerset Quarries, a distance of 66 miles.

3.3.5 The Network Rail Western Route Study identifies the following capability constraints between Reading and Cogload Junction (Taunton), where the line joins with the Bristol – Exeter route.

Network Rail Western Route Study:

The Network Rail Western Route Study (2015) identifies the following capability constraints between Reading and Cogload Junction:

- The speed mix of services between Westbury and Reading which range from 45mph freight services to 100mph long distance passenger services
- On-train crowding on services from west of Reading into Paddington

3.3.6 In some respects the two issues identified by Network Rail are interlinked as the overcrowding of services cannot readily be mitigated by increasing service frequencies due to the conflict between the performance characteristics of services on the route.

3.3.7 The B&H route will benefit from the GWEP. Like the GWML the route will receive partial electrification with the route being electrified between Reading and Newbury. This will allow Reading – Newbury service to be operated by electric traction, whilst Paddington – Bedwyn and Paddington – West of England services will be operated by Bi-Mode trains.

3.4 Committed Service Changes

3.4.1 As a result of the GWEP the B&H route will see a number of enhancements to services during 2019. The most significant change will be the operation of a train every two hours between London and Exeter serving intermediate stations including Pewsey and Westbury (but not Frome). This service will supplement the hourly London – Plymouth service which will continue to operate at an hourly frequency.

3.4.2 Linked to the completion of GWEP will be the introduction of new IET trains on the route. This process has already begun with the introduction of the first bi-mode IEP operated services on the London – Plymouth – Penzance services in August 2018; these trains can operate on diesel or electric power, allowing them to make use of the electrified route between London and Newbury.

3.4.3 The London – Bedwyn services will also utilise five car bi-mode IEP trains replacing the existing Class 166 Turbo trains that have operated the route since the early 1990s. This will represent a step change in quality, capacity and journey-times for this flow.

3.5 Long Term Opportunities

3.5.1 The Network Rail Western Route Study identifies a number of opportunities to enhance services by 2043 to deliver sufficient capacity and connectivity to meet demand. Due to the way in which the GWR franchise has evolved since the publication of the route study, the way the proposed service changes (which are largely extensions to services assumed to be delivered by 2019) interact with the actual service being delivered in 2019 has changed. Therefore the list below presents ALL services forecast to operate in 2043:

- 1 train per hour fast London – Plymouth (Penzance) - existing
- 1 train per hour semi fast London – Plymouth – new service
- 1 train per hour London – Newton Abbot, extending to Plymouth and Paignton in alternate hours – development of proposed 2019 service
- 1 train per hour London – Bedwyn - existing
- 1 train per hour Reading – Bedwyn – extension of existing Reading - Newbury
- 1 train per hour London – Newbury (with potential to extend to Westbury) - new

3.5.2 Clearly, if delivered, the above would represent a quantum increase in the level of service provided on the B&H route. Such improvements to services if deliverable would support the aspirations of the SWLEP, and as well as providing improved links to London would also provide significantly enhanced links to the South West.

4. WEST OF ENGLAND LINE

4.1 Existing Passenger Services

4.1.1 The WoE links London Waterloo to Exeter via Salisbury, with service operated by South Western Railway. Within the Wiltshire area the service is composed of :

- One train per hour London Waterloo – Exeter via Salisbury
- One train per hour London Waterloo – Salisbury with some services extending to Yeovil or Westbury

4.1.2 The service to Exeter provides a faster service to/from London as it calls only at Andover between Basingstoke and Salisbury. The service that terminates at Salisbury serves all intermediate station between Basingstoke and Salisbury, extending journey times.

4.1.3 The Waterloo – Salisbury service is extended five times per day to Yeovil Pen Mill via Yeovil Junction and twice a day to Westbury. In addition four Waterloo – Exeter services divide at Bristol and a portion travels forward to Bristol via Westbury, helping provide direct links between some Trans Wilts stations and London.

4.1.4 There is a good hourly cross-platform connection at Salisbury for journeys to / from London at Salisbury from WL services. Due to the slow speed of the services from Salisbury, however, connections at Westbury and/or Swindon are usually give faster journeys for travellers, even from nearby Warminster.

4.1.5 Additional connectivity to the South West is provided by interchange with GWR services at Exeter St. David's, and at Basingstoke connections can be made into services to Reading, the Midlands and north of England.

4.1.6 Average speeds on the route are relatively low reflecting the topography and infrastructure of the route and the 90mph maximum speed of the Class 159 diesel trains used.

4.2 Freight Traffic

4.2.1 The line west of Salisbury is not used by any regular freight traffic at the current time, although stone trains from the Mendip quarries can be routed this way. Between Salisbury and Basingstoke, the line is used by container trains operating between Southampton and the Midlands; services are routed this way to avoid capacity issues on the direct route from Southampton to Basingstoke via Winchester, whilst this also helps retain route knowledge for drivers to allow the diversion of services at times of engineering work.

4.2.2 The line is also used by freight trains operated for the Ministry of Defence linking depots at Warminster, Bicester and Ludgershall.

4.2.3 Looking to the future it is possible that trains may use the connection to the former Quidhampton Cement works to provide infill for the reinstatement of the cement works site.

4.3 Infrastructure & Constraints

4.3.1 The infrastructure on the WoE can be divided into two distinct sections, London – Basingstoke – Salisbury and Salisbury – Yeovil Exeter.

4.3.2 Between London Waterloo and Basingstoke services share a four-track railway with other services on the South West Mainline linking London with Southampton. This route is one of the most intensively used lines in the UK, especially between Woking and London. In operational planning terms this makes altering and amending services a very complex task, in any case the remaining capacity on the route is so low that altering the timetable in this area without infrastructure enhancements would achieve little, although the use of electric of Bi-Mode trains on the West of England services may incremental benefits. Between London and Basingstoke the line is electrified using the third rail system at 750v dc, however as the WoE is not electrified beyond Basingstoke all services to Salisbury are operated by diesel trains. The prevailing line speed along much of the route is 85mph, the lowest of the three east-west routes in the SWLEP area.

4.3.3 South of Basingstoke, at Worting Junction, the West of England diverges via a grade separated junction (the Battledown Flyover). Between there and Salisbury the route is a two track railway and is only used by WoE services and a limited amount of freight traffic. At Andover station there is a is a junction for the branch to MOD Ludgershall which is used on an as-required basis for MOD traffic.

4.3.4 Around 1.5 miles east of Salisbury station the line is joined by the line from Southampton to Salisbury. At this point a triangle is formed linking the two routes with a chord line known as the Laverstock Loop. This allows freight traffic to travel from Southampton to Basingstoke via Andover rather than Winchester, providing additional capacity and acting as a diversionary route.

4.3.5 Salisbury station historically had six platforms, however at present only four platforms are used, three through platforms and a east-facing terminal platform. The station is a potential capacity constraint, especially if there were an increase in the number of services terminating at the station, which would absorb platform capacity. The operation of the station is complicated by the use of portion working; trains to and from Exeter often join or divide to provide additional capacity between Salisbury and London. In addition South Western Railway have a depot adjacent to the station which requires trains to be moved between the station and depot; these moves absorb track capacity at certain times of day, especially in the morning and evening.

4.3.6 West of Salisbury the route changes character significantly. As part of rationalisation schemes in the 1960s and 1970s much of the route between Salisbury and Exeter was singled. Of the 88 miles between Salisbury and Exeter only 19 miles are double track, these being, a two mile section from Salisbury station to Wilton Junction, an 11 mile section from Templecombe to Yeovil Junction, a 3 miles section around Axminster and the final 3 miles from Pinhoe, where the line from Exmouth joins, to Exeter. There are additionally four passing loops on the route at Tisbury, Gillingham, Chard Junction and Honiton.

4.3.7 Inevitably these sections of line impact on both the capacity of the route in terms of service frequency but also the reliability of the route, as any delay to one service will impact on other services it crosses at passing loops. Given the interaction at the east of the route with the

intensive and capacity constrained South West Mainline there is considerable risk of transmitting delay from one end of the route to the other.

4.3.8 In combination, whilst the service level of two trains per hour in each direction is not high there are range of constraints on the development of services on the route.

4.3.9 The Wessex Route Study identifies the following constraints on developing the route further.

Network Rail Wessex Route Study:

The Network Rail Wessex Route Study (2015) identifies the following capability constraints that effect the development of services on the WoE

- The layout of Woking station with the potential need for a new flyover
- The layout of Basingstoke station, with the potential need for a new flyover from the Reading line to improve capacity
- Journey times on the WoE – the study identifies electrification and the relocation of passing places as an intervention.

4.3.10 Dealing with capacity issues at Woking and Basingstoke is about addressing capacity issues across the Wessex Route, not just on the WoE, however the WoE would benefits from any improvements delivered either through improvements in reliability or improvements to journey times or frequency. The completion of a flyover at Basingstoke may also present opportunities to develop services linking Salisbury with Reading, building on a service to be introduced in May 2019 operating hourly between Salisbury and Reading on Sundays. Operation of this is only possible on a Sunday due to the reduced level of services in operation in the area on Sundays relative to weekdays.

4.3.11 Overall the opportunities for developing the WoE are significantly constrained by the results of rationalisation at the west end of the route and the heavily used and capacity constrained sections of line from Basingstoke to London.

4.4 Committed Service Changes

4.4.1 The South Western Railway (SWR) franchise which began in 2017 has a small number of commitments to improve service levels on the WoE, including extending more peak services to Yeovil. There is also a commitment to reducing typical off-peak journey times between Salisbury and Basingstoke by 13%, a reduction of between 4 and 5 minutes. It is unclear from the available information how this will be achieved.

4.4.2 As part of the SWR franchise, the existing Class 158 and 159 fleet of diesel train that have operated the route for the last 25 years will be refurbished.

4.5 Long Term Opportunities

4.5.1 The timetabling constraints outlined above mean that the long-term opportunities around the development of services on the WoE are likely to be focussed on reducing the "Generalised" Journey Time with a mixed approach including some journey time reductions but also improvements to frequencies.. This is a measure of journey time that includes passengers perceptions of interchange and service frequency. On the WoE the opportunities for reducing GJT can be found in reductions in journey times and increases in frequencies. The

Wessex Route Study identifies that electrification from Basingstoke to Exeter using the 25kv ac overhead system, rather than the 750v dc system provides the opportunity to reduce journey times by as much as 14 minutes; much of this benefit would be achieved through improved acceleration and performance of electric trains relative to diesel trains. This would be a more-effective means of reducing journey times than investment in permanent way, as the topography of the route (especially west of Salisbury) is such that increasing line speeds would be very expensive, and may not yield the same level of benefit as electrification.

5. TRANS WILTS CORRIDOR

5.1.1 Within this study we use the term Trans Wilts Corridor to refer to all services operating from Bristol and Swindon to Westbury and onto Salisbury, the Solent or Frome, Yeovil and Weymouth. We note that this is a broader term than the traditional usage of Trans Wilts to relate to Swindon – Westbury via Melksham services.

5.2 Existing Passenger Services

5.2.1 The Trans Wilts corridor[1] is served by a range of services linking a diverse range of destinations. As well as a number of "core" services there are a number additional services that do not have a consistent service pattern. The following services operate on the route:

- 1 train per hour Cardiff Central – Portsmouth Harbour
- 0.5 trains per hour Great Malvern – Westbury (two service per day extend to Southampton and on service per day to Brighton)
- 9 services per day between Swindon and Westbury via Melksham of which two services extend Southampton and one to Frome.
- 7 services per day between Westbury and Salisbury operated by South Western Railway of which four start at Bristol and one at Yeovil, and four couple to Exeter – London Waterloo services at Salisbury
- 5 service per day Gloucester - Weymouth
- 7 additional services from Westbury to Warminster of which one service operates to Salisbury and one to Southampton whilst one originates at Frome and one at Bristol Parkway.

5.2.2 As can be seen the service pattern across the area is quite complex, however the core service is formed of two trains per hour linking Bristol with Westbury with one service going forward to Portsmouth via Salisbury and the other service either terminating at Westbury or going forward to Weymouth.

5.2.3 The Cardiff – Portsmouth service is a long distance inter urban service and forms the backbone of the service on the route. Within Wiltshire it makes calls at Bradford-on-Avon, Trowbridge, Westbury, Warminster and Salisbury. The Bristol – Westbury service provides calls at intermediate stations at Avoncliff and Freshford as well as Trowbridge and Bradford-on-Avon.

5.2.4 The Swindon – Westbury service provides the only services that call at Melksham. The service was enhanced in 2013 following a period from 2006 to 2013 where only two trains per day were provided. The current service is resource led with the frequency of services varying across the day with the largest gap in southbound services being around 2,5 hours and the smallest gap being 41 minutes.

5.2.5 South of Westbury service frequencies are less regular than north of Westbury. Whilst both the route towards Yeovil and Salisbury have regular services (two hourly and hourly respectively), they are supported by a patchwork of additional services, either extensions of services that terminate at Westbury, South Western railway extensions from Salisbury or additional services originating at Westbury. This provides a varying level of frequency across

[1] It should be noted that we use the Trans Wilts Corridor to refer to all of the Solent/Weymouth – Wiltshire – Bristol/Swindon routes, as opposed to the Westbury – Swindon service which it has historically referred too.

the day, for example in some hours up to three trains per hour depart from Salisbury towards Westbury, whilst in other hours only one train per hour operates for example there is only hourly provision north bound from Salisbury during the evening peak.

5.2.6 This is likely to reflect the piecemeal way in which services have developed, possibly making use of spare time in rolling stock and train crew workings on the part of both South Western Railway services and Great Western railway services.

5.2.7 The key connection opportunities from Trans Wilts services are at Salisbury, Westbury, Swindon and Bristol. As noted in the relevant sections above, the only regular-interval connections are at Salisbury, for London, and Bristol, for the Midlands, although the latter can involve long waits at Bristol; significant recasting of timetables and stopping patterns would be required to replicate this for the other key connecting journeys

5.2.8 Overall, whilst there are quite a substantial number of services operating on the route, the consistency of the service offered varies significantly across the day.

5.3 Freight Traffic

5.3.1 The Trans Wilts route is used by a mixture of freight traffic. On a weekday in September 14 services passed through Trowbridge station. Flows include Petroleum traffic from South Wales to Theale, stone trains from Whatley and Merehead to the north and MOD traffic linking bases at Bicester and Warminster and container trains from South Wales to Southampton. By the nature of such traffic not all services operate on all days.

5.3.2 The route is also an important diversionary route for freight traffic. When the B&H route is closed for engineering work stone trains are diverted via Trowbridge and Swindon and when the GWML is closed flows from South Wales and Bristol are diverted via Trowbridge, Westbury and the B&H route. This ability to act as a diversionary route has been particularly important during the Great Western Electrification Programme, although the restricted loading-gauge on sections of the route mean that not all freight traffic can currently be accommodated. It is however understood that Network Rail have begun GRIP Stage 1 work on gauge clearance between Bradford Junction and Bathampton Junction.

5.4 Infrastructure & Constraints

5.4.1 Whilst the Trans Wilts route is not as long as the other three routes in Wiltshire it is operationally complex. This is because the route cuts across the GWML, B&H Line and the West of England Line; all Trans Wilts services use one or more these routes at some point in their journeys. The route operates, with service feeding in from Bristol to the west, Swindon to the north east, Salisbury (and beyond) to the south east and Yeovil (and beyond) to the south west.

5.4.2 The core of the route from Bathampton Junction east of Bath to Salisbury is a double track railway, whilst the link from Trowbridge to Thingley Junction near Chippenham is a single track chord with a single-platform station located on it at Melksham. Whilst the level of service operated on the core route is not intensive for a two track railway, with only three or four trains per hour in each direction, the combination of the diverse range of origins and destinations, coupled to the interaction with the three east-west routes, can make planning

services complex. This also presents the opportunity for delay to be transmitted along the route, with the potential to impact on locations as far apart as Brighton and Great Malvern.

5.4.3 The line speed on the route is typically 75mph between Salisbury and Westbury and 70mph between Westbury and Bathampton Junction and Trowbridge to Thingley Junction. The signalling headway on the route varies between four and six minutes depending on the location, giving a theoretical minimum capacity of ten trains per hour, however given that a train running from Bristol to Southampton has to pass through six major junctions in Wiltshire alone this level of capacity is far from deliverable in practice. This is further limited by the spacing of signalling sections, with for example one sections including the three stations of Freshford, Avoncliff and Bradford-on-Avon, the impact of this is that fast services take around half the time of stopping services, reducing capacity further.

5.4.4 The Network Rail Western and Wessex Route Studies have identified the following constraints on the route:

Network Rail Wessex Route Study:

The Network Rail Wessex Route Study (2015) identifies the following capability constraints that effect the development of services on the WL

- Signalling headways and single line capacity between Chippenham and Trowbridge via Melksham
- Swindon station line and platform capacity
- Bristol East Junction capacity (approach to the station from Bristol Parkway and Bath)
- Southampton Central and Salisbury station capacity

5.4.5 The majority of constraints on the route are linked to issues on other parts of the network rather than limitations on the Trans Wilts route itself, with the exception of the single line via Melksham.

5.4.6 In addition to the constraints identified above, there are a number of issues that have been raised when aspirations for improving services have been investigated. These include platform capacity at Westbury, where the station only has three operational platforms, and also line and junction capacity between Thingley Junction and Swindon.

5.4.7 Overall the majority of capacity and infrastructure constraints on the route are driven by interaction with other routes rather than specific issues on the WL Route itself.

5.5 Committed Service Changes

5.5.1 There are no significant changes to services committed as part of the current GWR franchise. The main change which is currently ongoing is the cascade of rolling stock as a result of the GWEP described above. This is resulting in the cascade of Class 16x Turbo trains to the route from the Thames Valley / Newbury / Bedwyn services, replacing Class 150 “Sprinter” and Class 158 “Express” diesel trains. The Class 16xs will increase seating capacity and also provide an improved passenger environment over the class 150 although in their current form they arguably provide a poorer passenger environment than a Class 158 for longer journeys.

5.6 Long Term Opportunities

5.6.1 The Network Rail Western Route study identifies the following improvement to services for the Trans Wilts corridor:

- Increase in frequency to hourly between Swindon and Westbury
- Additional train each hour between Bristol and the South Coast

5.6.2 It is however known that local stakeholders have other aspirations for the route; for instance, it is possible that the proposed Metro West services promoted by the West of England Combined Authority may result in the operation of additional service between Westbury and Bristol.

5.6.3 Within the Route Study, the additional service between Bristol and the South Coast is identified as terminating at Brighton. However the recent Great Western franchise consultation has identified that the existing Great Western Railway services that operate to Brighton may be curtailed to terminate at Southampton.

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