

Dorset Connectivity Strategic Study

DECEMBER 2021

Network Rail Long-Term Planning Process



Contents

1.	Exec	utive Summary	3
	1.1.	Heart of Wessex Line: The Problem	4
	1.2.	South West Main Line: The Problem	5
	1.3.	West of England Line: The Problem	6
	1.4.	First and Last Mile: The Problem	6
	1.5.	Outputs and Associated Interventions	7
	1.6.	Opportunities	9
	1.7.	Outcomes	10
	1.8.	Emerging Strategic Advice	10
2.	Intro	duction	13
	2.1.	Long-term Planning Process and Strategic Studies	13
	2.2.	Dorset Connectivity Strategic Objective	14
	2.3.	Geographic Scope	15
3.	Wide	er Dorset Area: Place and the Railway	18
	3.1.	An introduction to the wider Dorset Area	18
	3.2.	Railway Infrastructure and Service	21
4.	Wide	er Dorset Area: Economy and Connectivity	43
	4.1.	Dorset Economic Overview	43
	4.2.	The Regional Connectivity Problem	50
5.	A Vis	sion for Improving Connectivity	63
	5.1.	Maximising and Integrating Public Transport in Dorset	65
6.	Eme	rging Strategic Advice	79
	6.1.	Recommendations	81
7.	Next	Steps	
8.	Арре	endices	
	8.1.	Safety Baseline	
	8.2.	Illustrative draft specification for Wareham station master planning exercise	89
	8.3.	Output Alignment with Sub-national Transport Bodies	93



1. Executive Summary

Improving the connectivity of the railways and ensuring that train services are complimented by effective public transport systems will allow rail to become a viable alternative to public car use, particularly for local and regional journeys. Any improvements to rail provision and services will also provide benefit to existing rail users. This will therefore bring environmental, productivity and congestion benefits to the Dorset area.

This strategic study is an assessment of some potential choices for the South West Main Line (SWML) between the New Forest and Weymouth and Heart of Wessex Line services between Weymouth and Westbury (continuing through to Bristol Temple Meads). These choices are presented to understand what may be required improve to connectivity in and around the Dorset Council and Bournemouth. Christchurch and Poole Council areas. Consideration has also been given to of England and the Solent.

This strategic study builds upon the earlier West of England Line CMSP (Continuous Modular Strategic Planning) document (LINK) which recommended enhancements to rail



Figure 1 – South Western Railway train at Wareham. "<u>IMGP1936</u>" by <u>Matt Buck</u> is licensed under <u>CC BY-SA 2.0</u>.

services between London Waterloo and Exeter St. David's via Salisbury and Yeovil Junction. These two studies represent a linked strategy for the western part of the Wessex Route and should be considered together with strategic studies produced by the Western Route, particularly those focused on Exeter and East Devon.

Industry partners and stakeholders have participated in the development of this study. This collaborative approach has helped to identify some possible investment

choices to accommodate stakeholder aspirations for improved connectivity and to maximise the potential for rail as a key means of decarbonising the transport sector.

1.1. Heart of Wessex Line: The Problem

The Heart of Wessex Line supports several functions including providing a link between the coastal area in and around Weymouth to Bath and Bristol and beyond to South Wales, the South West Peninsula, and the Midlands. During the summer season trains can be overcrowded, but at other times trains can be lightly patronised. Low patronage could be as a result of poor reliability and an irregular timetable with gaps of two to three hours at times, making rail unattractive to potential passengers. The timetable structure is very rigidly defined and determined by the following factors without infrastructure interventions:



Figure 2 - Yeovil Pen Mill Station

- There are a number of locations where the line speed is constrained owing to the topography and gradients through the area which limits the line speed to 75mph, but with some areas were speeds drop considerably
- The line between Castle Cary and Weymouth is predominately single track with passing loops at Maiden Newton and Yeovil Pen Mill
- There are a large number of footpath and user worked level crossings that may need upgrading or closure if service patterns and frequencies were to change
- There is a lack of operationally efficient interchange between the Heart of Wessex and West of England lines
- Services interact with other lines such as the 'Berks & Hants' at Castle Cary and several lines at Westbury that may constrain the ability to improve services, for instance services from London Paddington are more likely to dictate how the timetable is constructed

1.2. South West Main Line: The Problem

The South West Main Line supports several functions including providing a link between the coastal area in and around Weymouth to the South East Dorset conurbation (comprising of the Bournemouth, Christchurch and Poole Council area and parts of the Dorset Council area), Southampton Central, Southampton Airport Parkway, for connectivity with flights, and through to London Waterloo. With 11 % of employment in Dorset linked to tourism and 500,000 annual visitors to Bournemouth alone, there is potential for rail to support commuting and business travel as well as leisure journeys, particularly when other transport modes are integrated at key locations.

Although there is no regular overcrowding experienced by passengers from locations in the scope area, there can be localised overcrowding during the summer season when more leisure journeys are made. There are some locations where resilience, particularly at times of disruption, can impact the perceived reliability of the service through the area. The timetable that is operated does not include a regular service interval for stations west of the Solent with gaps of 40 to 50 minutes at times for some of the smaller stations. Therefore, the rail service could be seen by potential passengers as unattractive, particularly for non-London journeys. The timetable structure is very rigidly defined and determined by the following factors without infrastructure interventions:



Figure 3 - Bournemouth Beach

There are several locations where the line speed is constrained owing to the lack of lengthy, straight track sections as the line curves to follow the coastline and topography

• Power supply is a major constraint west of Poole as this limits the number and length of passenger trains that can operate

• Poole and Wareham level crossings impart considerable safety risk and any additional services may lead to increased down time and the risk of members of the public behaving in an unsafe manner

- The single line between Moreton and Dorchester South is a potential constraint to growth
- The single line in throat of Weymouth station is a potential constraint to growth

1.3. West of England Line: The Problem

The West of England Line supports several functions principally business flows in and out of London and Exeter, as well as Salisbury (and onwards to Southampton) and Basingstoke. It is also an important rail line for leisure and educational travel to London, Salisbury and Exeter. The use of the line as a diversionary route for freight in the east and passenger and freight services west of Yeovil Junction (in conjunction with the Heart of Wessex line) highlights the importance of the line beyond the regular services that use it.

Performance and service reliability is often poor owing to the long sections of single track and passing loops that were provided when the line was downgraded in the 1960s with 75% of the line west of Salisbury single track. This can have knock on impacts to other parts of the network causing reactionary delay.

The previously published West of England line CMSP highlighted a number of additional loops that would need to be provided to enable two trains per hour from Yeovil Junction to London Waterloo and the additional Exeter St. David's to Axminster Devon Metro service. The Dorset Connectivity study builds upon these suggested options for funders by discussing how the recommendations of the studies can complement each other to provide wider connectivity.

1.4. First and Last Mile: The Problem

In the South East Dorset conurbation and the Dorchester and Weymouth areas there are networks of high quality and frequent urban bus services. There are also some high quality bus services that operate between larger towns; however, this is not necessarily the case everywhere. However, in this study several locations were identified where infrequent bus services provide poor connectivity with similarly infrequent rail services. This results in an unwillingness to use sustainable transport modes when making journey choices. Owing to the railways in Dorset being positioned around the edges of the wider county area there is a reliance on the private car or in some cases an infrequent bus service to access the railway. Areas to the north of the South East Dorset conurbation and rural villages along the Heart of Wessex may require improved bus services to connect to the railway at key locations.

In some locations the provision and integration of active travel modes could be improved to encourage people out of their private cars, particularly in more urban areas and for onward leisure journeys.



Figure 4 - 'Jurrasic Coaster' Bus at Axminster Station "BF63 HDY (Route X53) at Axminster Station" by Matt Davis is licensed under <u>CC BY-SA 2.0</u>.

1.5. Outputs and Associated Interventions

Discussions with stakeholders and an extensive review of other organisations' policy and strategy aspirations has identified the interventions required to deliver against five outputs, these outputs are:

- 1. Provision of an hourly train service on the Heart of Wessex Line between Bristol Temple Meads and Weymouth, variations on this service level were considered:
 - a. Direct via the existing route
 - b. Via Yeovil Junction using a new south chord between the Heart of Wessex Line and the West of England Line
 - c. A "fast" service every other hour with a limited stopping pattern
- 2. Provision of an additional two trains per hour through the South East Dorset conurbation between Wareham and Brockenhurst:
 - a. +2tph
 - b. +3tph 4tph
- 3. Provision of enhanced services between Weymouth and the South East Dorset conurbation:
 - a. Evenly spaced 2tph
 - b. Increasing frequency
- 4. Provision of improved interchange opportunities across Dorset and surrounding counties through the delivery of the enhancements specified in

the West of England Line CMSP in combination with the proposed service changes in this study

5. Improved First and Last Mile connectivity between rail and other modes to encourage modal shift away from private car use

The interventions required for Outputs 1-3 are summarised in the table below:

	Outputs						
Interventions to deliver Outputs	1		2		3		
	α	b	с	α	b	α	b
Weymouth throat re-doubling	~	~	~			~	✓
Moreton Single re-doubling						v	✓
Power supply upgrade				~	✓		✓
Level Crossing review and associated upgrades or closures	~	v	•	•	~		~
Signalling headway reduction				~	~		~
Wareham Level Crossing closure				✓	~		~
Poole Level Crossing closure				~	~		~
Bournemouth remodelling				✓	~		~
Brockenhurst remodelling				✓	~		~
Extensive four-tracking of SWML					✓		
Extension of Maiden Newton loop	~	~	~				
Yeovil south chord		✓					
Linespeed improvements	✓	✓	✓				
Extension of double-track south of Castle Cary	~	✓	~				
Additional track/platform in Westbury area	~	~	~				
Extensive or complete re-double tracking of the Heart of Wessex Line			~				

Table 1 - Summary of interventions to deliver outputs from the Dorset Connectivity Study

Outputs 4 and 5 are over-arching to the three core outputs above. Improved service levels provide the opportunity to improve transport mode integration, accessibility and other operational and passenger experience concerns.

1.6. Opportunities

To obtain best value and ensure efficiencies can be taken advantage of, there are a number of opportunities that should be considered by linking service change interventions, as described above, to infrastructure renewals, other planned enhancement works and rolling stock replacement. In particular, there are a number of forthcoming re-signalling schemes which provide a useful opportunity to consider cost-effective infrastructure enhancements at the same time.

An opportunity to carry out these enhancements would be when re-signalling works are carried out as efficiencies can be made in the design and delivery of the works. Currently, the Dorchester and West of England Line (Basingstoke Panel) signalling areas are planned for renewal in Control Period 8 (CP8 – 2029 to 2034), the Yeovil Pen Mill signalling area is planned for delivery in Control Period 9 (CP9 – 2034 to 2039).

Linking enhancements to the South West Main Line, Heart of Wessex line and West of England line re-signalling schemes provides an opportunity for rail services in and around Dorset to play a much greater role in their local communities than at present, and at relatively lower cost, given that the re-signalling schemes would have to be undertaken anyway as part of Network Rail's ongoing renewal work.

There are also opportunities arising from decarbonisation, with potential replacement of the existing diesel rolling stock on the Heart of Wessex and West of England lines with possible new electric, bi-mode or tri-mode, hydrogen or battery powered vehicles. In the event of full or part-electrification of any of the non-electrified lines in and around Dorset, in accordance with the emerging decarbonisation strategies for Southern and Western Regions, it could be more cost-effective to carry this work out at the same time as re-signalling works.

In terms of improving First and Last Mile connectivity, Network Rail and the rail industry colleagues have been involved in discussions with local authorities about the development of their Bus Service Improvement Plans (BSIP) as required by the 'Bus Back Better' National Bus Strategy published in March 2021 by the Government. The Government is keen to see improved integration between bus and rail services in these plans, and this is an important opportunity for collaborative working.

Providing enhanced inter-urban bus services operating at least on an hourly frequency, integrating with improved Dorset rail services will allow public transport as a whole to improve its offer across Dorset and surrounding counties thereby delivering modal shift and achieving climate change and other targets that are shared by stakeholders.

Collaborative working with Bournemouth, Christchurch and Poole and Dorset Councils to ensure other public transport and active travel modes are integrated at railway stations is essential when making the business case for rail connectivity service improvements.

1.7. Outcomes

These outputs would deliver a number of positive outcomes for rail users and stakeholders as follows:

- Improved performance on the routes that had been upgraded owing to the targeted removal of single track sections to aid service recovery at times of perturbation
- Enhanced connectivity between Dorset's network of railway lines and potentially with enhanced bus services as part of Enhanced Partnerships thereby transforming the public transport offer in Dorset and surrounding counties, assisting decarbonisation
- Improved diversionary capability to the South West of England at times when GWR services are unable to use the route via Taunton
- Enhanced transport options for the mobility impaired as a result of station access improvements linked to station masterplans
- Support economic, housing and employment growth as well as increased productivity across the Western Gateway and Peninsula Sub-national Transport Body areas

1.8. Emerging Strategic Advice

It is important to stress that the recommendations that this strategic study has developed are not only about providing improvements to Heart of Wessex Line and South West Main Line services in the future, but also seeking to address current problems, such as poor performance, that are experienced now.

Based on the findings of this strategic study the following recommendations can be made (further details can be found in section 6):

	Dorset Connectivity: Emerging Strategic Advice					
1	Closure of the level crossing at Poole should be progressed collaboratively between Network Rail, the Western Gateway Sub-national Transport Body and Bournemouth, Christchurch and Poole Council, depending on the availability of funding					
2	Closure of the level crossing at Wareham should be progressed collaboratively between Network Rail, the Western Gateway Sub-national Transport Body and Dorset Council, depending on the availability of funding					
3	 At the appropriate time, as directed by DfT, a Decision to Initiate, or series of Decisions to Initiate for individual elements, should be raised by Network Rail within the Rail Network Enhancements Pipeline process. Work carried out in this strategic study suggests the following service changes should be progressed: A 1tph service on the Heart of Wessex Line with an additional call at Yeovil Junction via a new south chord A +2tph service between Wareham and Brockenhurst An improved half hourly interval between services operating from Weymouth to London Waterloo 					
4	The recommendations of the West of England Line CMSP should be progressed with the intention of integrating them with the recommendations of this strategic study to enable improved cross-regional connectivity					
	Masterplan exercises should be undertaken on the following station locations:					
5	Bournemouth Brockenhurst Weymouth Wool Dorchester Dorchester West South					
	Christchurch Yeovil Pen Yeovil Moreton Wareham Poole Mill Junction					

 Table 2 - Emerging Strategic Advice from the Dorset Connectivity Study

The closure of the level crossings at Poole and Wareham should be progressed regardless of any change in service provision owing to known safety and downtime issues. The potential Restoring Your Railways scheme at Wareham and the Transforming Cities Fund Poole town centre development provide an opportunity to work in collaboration to solve these issues.

Network Rail is open for business and welcomes the chance to work with funders and interested parties to progress these recommendations. Network Rail will continue to work with funders (both central Government and potential local funders) to refine credible options that meet the needs of passengers; that drive social and economic benefits; and that fit with the long-term needs of a safe and reliable railway system.



2. Introduction

2.1. Long-term Planning Process and Strategic Studies

These Strategic Studies are part of an ongoing process of continuous planning that addresses more focussed 'modules'. These modules mean that transport needs of smaller geographical areas can be examined, or specific strategic questions can be addressed through closer engagement with stakeholders including Local Authorities, Local Enterprise Partnerships, Sub-national Transport Bodies and Passenger/User Groups.



Figure 5: Strategic Study process diagram

DIG-IMMMM

Strategic Advice and recommendations are produced using the industry process shown in Figure 5, providing a rolling programme of recommendations and answering specific strategic questions defined by the rail industry in collaboration with stakeholders. The strategic study process is the mechanism which provides funders with an impartial, evidenced-based strategy for the long-term future of the railway. In doing so, it puts the priorities of passengers and freight-users first by identifying opportunities for rail investment to stimulate economic growth as part of the wider transport system. As a collaborative approach to strategic planning,

13

service specifiers, train operators and local and sub-national transport bodies work with Network Rail to develop these investment recommendations.

Making the best use of train, track and station capacity is a key challenge for the rail industry. It is important to understand how service patterns, journey times and train performance impact the capacity and capability of the rail network, and the strategic study process is led by Network Rail to balance these factors. All strategic studies work is supported by a governance structure, including a working group, whose members contribute local knowledge and evidence throughout the process.

2.2. Dorset Connectivity Strategic Objective

The objective of this Strategic Study module is to investigate and find solutions to the lack of rail connectivity experienced by passengers and residents of the wider Dorset area. It is proposed that improving rail connectivity would result in modal shift away from private vehicles to rail. This would have the benefit of alleviating road congestion in the urban areas of Dorset, contributing to sustainability and decarbonisation targets, increasing productivity, and improving mobility options across the wider South West region of the UK.

This Strategic Study will investigate:

- 1. North to South connectivity from the Dorset coast via the Heart of Wessex Line to Bristol, South Wales, Swindon and the South West either by more frequent direct services or improved interchange at Yeovil stations, Castle Cary or Westbury with services on the West of England Line and Great Western Main Line
- 2. East to West connectivity between rural Dorset and the South East Dorset conurbation and through to Hampshire
- 3. Identify First and Last Mile opportunities to improve the whole sustainable journey package that rail forms a central part of

The service changes and associated infrastructure interventions that were identified in the West of England Line Continuous Modular Strategic Planning (CMSP) study should be seen as forming a wider strategy for the western part of the Wessex Route in combination with this strategic study. The service changes and infrastructure interventions identified through the CMSP provide the building blocks for connectivity from the wider South West region into and out of Dorset and the South East Dorset conurbation. The CMSP can be accessed via the Network Rail website here: https://www.networkrail.co.uk/wp-content/uploads/2020/07/West-of-England-Study-Continuous-Modular-Strategic-Planning.pdf

2.3. Geographic Scope

Dorset is a key area for the national rail network for both commuter, business, and leisure travel. The South West Main Line (SWML), a main commuter route, links London Waterloo with Southampton, Bournemouth and Poole terminating at Weymouth. At Dorchester, the Heart of Wessex Line between Weymouth and Bristol joins the SWML.

Within the wider Dorset area, is the South East Dorset conurbation, consisting of the towns of Bournemouth, Christchurch and Poole. These two areas are included in the Dorset Council and the Bournemouth, Christchurch and Poole (BCP) Council areas which were formed in 2019 as unitary authorities.



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Figure 6 - Geographic Scope

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Although the study is entitled 'Dorset Connectivity', its boundaries include a number of stations outside the current Dorset Council and Bournemouth, Christchurch and Poole local authority boundaries. In terms of railway geography and connectivity between different lines serving the area, this means that it is appropriate to consider stations in surrounding counties including Yeovil Junction and Yeovil Pen Mill in Somerset, Westbury in Wiltshire and stations towards Southampton Central in Hampshire.

The study focusses on assessing the feasibility of service options between Weymouth and Brockenhurst and Weymouth and Westbury (green on the scope map. However, in terms of services it is recognised that trains will run on to or interchange with other services to locations such as Bristol Temple Meads, Taunton, Exeter St. David's, Lymington Pier and Southampton Central (red on the scope map). In addition, the link between the Swanage Railway and Wareham on the SWML has been considered, particularly in light of the 'Restoring Your Railways' funding that the Swanage Railway has been awarded to produce a Strategic Outline Business Case (SOBC). Potential interchange with Fawley Waterside services may also be achievable should the Waterside 'Restoring Your Railways' scheme be progressed to delivery. Comment will be made based on other Strategic Studies and previous analysis

3. Wider Dorset Area: Place and the Railway

3.1. An introduction to the wider Dorset Area

The county of Dorset is situated on the south coast of England between Devon to the west and Hampshire to the east and bounded by Wiltshire and Somerset to the north. It is predominantly a rural county with many market towns and villages, but larger settlements are Dorchester, Weymouth and what is often known as the South East Dorset conurbation comprising Poole, Bournemouth and Christchurch. Dorset has two unitary local authorities – Bournemouth, Christchurch and Poole Council and Dorset Council, that are responsible for all council services in those respective areas.



Figure 7 - Location of the Dorset and BCP unitary authorities in relation to the wider area (Using OpenRailwayMap and OpenStreetMap data)

In 2019 the population of the Dorset Council area was approximately 378,000 and the Bournemouth, Christchurch and Poole Council area was approximately 395,000. By 2028 the population of Bournemouth, Christchurch and Poole is forecast to increase by 25% to 403,000.¹ The South East Dorset City Region (which includes the Bournemouth, Christchurch and Poole Council area as well as parts of Dorset)

¹ BCP Council, A Local Plan for Bournemouth, Christchurch and Poole Issues and Options Consultation (August 2021

has the second largest urban population² in South West England. It has a workday population of 480,000 with growth plans up to 2026 for the creation of 20,000 new jobs and 29,400 new homes. ³

Office for National Statistics (ONS) population forecasts indicate the population of the Western Gateway area, which includes both Dorset and the South East Dorset City Region, is set to increase by an additional 448,000 people by 2041. The projected rate of population growth within the Western Gateway (15%) area is higher when compared to England overall (12%).⁴ However, population growth is not forecast to take place at the same rate across the Western Gateway area. Figure 8 illustrates the rate of projected population growth by Local Authority area. ⁵



Figure 8 - Rate of projected population growth from 2016 to 2041 by Local Authority area (Western Gateway, July 2019)

Population growth between 2016 and 2041 is projected to be highest in Bristol (21%), South Gloucestershire (21%) and North Somerset (19%). This scale of growth is well above the average rate of growth for the Western Gateway area.

² Bournemouth Borough Council, Borough of Poole and Dorset County Council, *Bournemouth, Poole and Dorset Local Transport Plan 3* (2011), section 1.1.2.

³ BCP Council, *Transforming Cities Fund South East Dorset City Region*, Executive Summary

⁴ Western Gateway Sub-national Transport Body, *Regional Evidence Base Part 1 Story of Place* (2019), section 3.3

⁵ Western Gateway Sub-national Transport Body, *Regional Evidence Base Part 1 Story of Place* (2019), section 3.3

Wiltshire and Bournemouth, Christchurch and Poole are projected growth rates consistent with England (12%). Dorset (8%) is the only area in the Western Gateway area where population growth is less than the average for England. This may be linked to poor transport connectivity, an ageing population and the relatively high cost of accommodation forcing people to live away from the area for work or education.

The Bournemouth, Christchurch and Poole area is home to over 15,000 businesses and in 2019 there were 193,000 people employed in the area. A high proportion of jobs are within the finance, engineering and manufacturing, and health and social care sectors. In Summer 2020 it was forecast that between 2018 and 2038 11,000 jobs would be generated in BCP which equates to a growth of around 5%.⁶

Dorset is heavily reliant on tourism for its economic success, with 30,035,000 day and overnight visitors in 2019 and 11 % of all employment in Dorset being linked to tourism.⁷

In the Bournemouth, Christchurch and Poole area there are 15 million visitors annually spending £800m and there are 19,000 tourism jobs.⁸

In 2014 Visit England (the national tourism agency)



Figure 9 - Bournemouth Beach

identifies several locations within the study area to be some of the most visited in England:

- Bournemouth (11th) 500,000 annual visitors
- New Forest (12th) 500,000 annual visitors
- Weymouth (20) 400,000 annual visitors

⁶ BCP Council, A Local Plan for Bournemouth, Christchurch and Poole Issues and Options Consultation (August 2021) ⁷ Dorset Tourism Partnership, The Economic Impact of Dorset's Visitor Economy 2019 (2019), Dorset – Key Facts at a Glance

⁸ BCP Council, A Local Plan for Bournemouth, Christchurch and Poole Issues and Options Consultation (August 2021)



Figure 10 - The New Forest

There are two major higher education institutions in the study area. Bournemouth University, based in Bournemouth and Poole, has more than 19,000 students and employs 1,800 staff. Arts University Bournemouth has 3,400 students and specialises in art, design, performance and media. In addition, Bournemouth and Poole College has 11,000 students.

3.2. Railway Infrastructure and Service

3.2.1. South West Main Line

The SWML is the 142m route from London Waterloo to Weymouth. Between Southampton Central and Weymouth, it is a double track electrified railway of approximately 63 miles in length, with short single track sections west of the South East Dorset conurbation at Moreton, and immediately outside Weymouth station. It connects 24 passenger railway stations. There are also freight facilities at Hamworthy Quay near Poole Harbour and other sites generating freight traffic around Winfrith and Wool.



Service Frequency

Figure 11 - The South West Main Line at Southampton

The table below sets out the number of trains that called at each station pre-COVID within the SWML scope of this strategic study both in the peak and off peak periods:

Station	Frequency: AM Peak arrivals at London Waterloo (08:00 to 08:59)	Frequency: off peak (tph)
Brockenhurst	3*	4*
Sway	2	1
New Milton	2	2
Hinton Admiral	2	1
Christchurch	2	2
Pokesdown	2	2
Bournemouth	3*	4*
Branksome	2	2
Parkstone	2	2
Poole	2	3
Hamworthy	1	2
Holton Heath	1	1
Wareham	1	2
Wool	1	1
Moreton	1	1
Dorchester South	1	2
Upwey	1	1
Weymouth	1	2

*includes CrossCountry service to Manchester Piccadilly

Table 3 - Service frequency on the South West Main Line in the peak and off-peak periods (based on pre-COVID timetable)

It can be seen that not all stations receive the same frequency of service which indicates that there is a mix of fast and stopping trains. Owing to the predominately two-track nature of the railway in the scope area there are no opportunities for faster services to overtake stopping services, this means faster services can be slowed down by a stopping service. This is further exacerbated by the sections of single track which impact services in both directions. This is particularly the case for services to and from Weymouth, these services are not an even 30 minutes apart.

Since the start of the COVID pandemic there has been a reduction in service frequency at some locations owing to the significant drop in patronage that has been experienced across the national rail network. South Western Railway (SWR) have recently consulted on their plans for a December 2022 timetable change that

seeks to provide a resilient service that meets the capacity requirements dictated by post-COVID demand. Although this will potentially result in some changes to the pre-COVID position highlighted above it does not take away from the premise that an increase in frequency is a means of encouraging passengers to use the railway.

Service Intervals

The uneven interval between the two services that operate to/from Weymouth occurs for two main reasons. Firstly, the infrastructure with a single line section in the Moreton area and immediately north of Weymouth station, dictates the timetable pattern. Secondly, the two trains serve slightly different purposes. One of the trains is more limited in its stopping pattern, prioritising journey times to and from London Waterloo, with calls at a few key locations en-route. The other service calls at more of the intermediate stations as does the slower service to and from Poole, and these two services provide local connectivity and accessibility to local facilities.

The table below illustrates the uneven pattern of services at specific stations, based on the pre-COVID December 2019 timetable:

Station	Direction	Times of services in 11:00 to 11:59 hour	Gaps between services
Brockenhurst	Up	11:00*	15
		11:15	18
		11:33	12
		11:45	15
Brockenhurst	Down	11:05	11
		11:16	22
		11:38	20
		11:58*	7
New Milton	Up	11:22	15
		11:37	45
New Milton	Down	11:26	19
		11:45	41
Christchurch	Up	11:13	17
		11:30	43
Christchurch	Down	11:35	17
		11:52	43
Pokesdown	Up	11:09	17
		11:26	43
Pokesdown	Down	11:38	18
		11:56	42
Bournemouth	Up	11:05	17
		11:22	23
		11:45* Starts	14
	_	11:59	6
Bournemouth	Down	11:04	9
		11:13* Terminates	11
		11:24	20
		11:44	20
Branksome	Up	11:48	9
	_	11:57	51
Branksome	Down	11:29	20
		11:49	40

Station	Direction	Times of services in 11:00 to 11:59 hour	Gaps between services
Parkstone	Up	11:44	10
		11:54	50
Parkstone	Down	11:32	20
		11:52	40
Poole	Up	11:07	33
		11:40	10
		11:50 Starts	17
Poole	Down	11:14 Terminates	22
		11:36	19
		11:55	19
Hamworthy	Up	11:01	34
	_	11:35	26
Hamworthy	Down	11:19	23
		11:42	37
Wareham	Up	11:28	25
	_	11:53	35
Wareham	Down	11:28	21
		11:49	39
Dorchester South	Up	11:13	20
		11:33	40
Dorchester South	Down	11:05	44
		11:49	16
Weymouth	Up	11:03	17
	_	11:20	43
Weymouth	Down	11:06	10
		11:16	50

*denotes the CrossCountry service to/from Manchester Piccadilly

Table 4 - Gaps between services based on the pre-COVID December 2019 timetable

Stations with a regular hourly or two hourly service such as Moreton and Sway are not included in the above table as they do not suffer from the irregular interval issue.

The impact of the long intervals between services at some of these stations even where there are two trains per hour may be to suppress demand. The irregular frequency of the rail services may also make it difficult to co-ordinate with bus services, in particular those that run less frequently, thereby discouraging modal shift to public transport for the end to end journey.

Key Passenger Flows

Analysis carried out on the SWML (Weymouth to Southampton Central) has identified the top 15 passenger journey flows within the scope area, these can be seen in the table below. These do not include journeys to London Waterloo or outside the wider scope area of this study, although it is important to note that from a financial and customer satisfaction perspective the London services are very important.

Ranking	Station to Station Flow	Miles
1	Bournemouth - Southampton Central	28m 63ch
2	Bournemouth - Poole	5m 60ch
3	New Milton - Bournemouth	9m 38ch
4	Bournemouth - Brockenhurst	15m 16ch
5 Brockenhurst - Southampton Central		13m 47ch
6	New Milton - Southampton Central	19m 25ch
7	Christchurch - Brockenhurst	11m 42ch
8	Poole - Southampton Central	34m 43ch
9	Weymouth - Bournemouth	34m 62ch
10	New Milton - Brockenhurst	5m 58ch
11	Weymouth - Poole	29m 02ch
12	Totton - Southampton Central	3m 24ch
13	Christchurch - Bournemouth	3m 54ch
14	Wareham - Poole	7m 08ch
15 Pokesdown - Brockenhurst		13m 38ch

Table 5 - Top 15 passenger journeys within the Dorset Connectivity Scope area

From the above table it can be seen that the top flows within the wider study area on the SWML are focussed on journeys into and across the South East Dorset conurbation and from the South East Dorset conurbation towards Southampton Central, the top ranking flow being from Bournemouth.

The South East Dorset conurbation to Southampton Central flow is already well served by trains that continue on to London Waterloo. These services are not overcrowded from locations within the conurbation and a good service frequency is provided, including a CrossCountry service with limited stops. The infrastructure in the Southampton area is highly constrained in terms of capacity and there are already several competing service changes proposed in the Southampton Central area, such as the Waterside service to Fawley, improvements suggested through the Solent Connectivity CMSP, as well as potential main line service uplifts (to be identified through a forthcoming strategic study).

Passenger Trends

The Office of Rail and Road (ORR) publishes passenger entry and exit data every year; this can be used to give a view of how passenger trends have changed over time.



Figure 12 - Passenger entry and exit data for stations in the Dorset Connectivity scope area

The data shown in Figure 12, above, shows that in a number of locations there has been a reduction in the number of passengers using some stations over the 2018/19 period (pre-COVID). In part this may be partly the result of industrial action by SWR guards and the impact of not meeting performance targets on the Wessex Route resulting in passengers turning away from rail, particularly for more local or regional journeys where the car is a viable alternative. Improving performance and resilience on the Wessex Route, not just within the scope area, is key to introducing any service change that this strategic study may propose.

Bournemouth is clearly the most well patronised station in the scope area of this study, and it can be seen that there are several relatively lightly used stations to the west of Poole and to the east of Bournemouth. This highlights a potential opportunity for rail to grow its market share at some of these locations through service and performance improvements in conjunction with any planned housing and employment growth.

It must be noted that COVID-19 and the associated lockdowns and other restrictions have led to a substantial reduction in rail travel since March 2020. It is far from clear what the long term impact of this will be on the UK economy and when the demand for rail travel, both peak and off peak, may return. Early signs are that regional and leisure travel are returning more quickly than London commuting.

Rolling Stock

London Waterloo – Weymouth

SWR mainly use Class 444, and on occasions Class 450, trains on services through to Poole and Weymouth. Class 444 rolling stock is made up of 5-car units, with each car being approximately 23m in length with a 2+2 seating arrangement. Two 5-car units are often split or joined at Bournemouth or Southampton Central to operate as 10-car services on the busiest part of the main line into London Waterloo. West of Poole the power supply available limits the train length to 5-cars between Weymouth and Poole; this will be described in more detail later in this section.

Figure 13 - Class 444 5-Car unit "Class 444 in swr livery- update" by Unisouth and Benspiersphotos is licensed under <u>CC BY-SA</u> <u>3.0</u>.

Class 450 rolling stock is made up of 4-car units, with each car being approximately 20m in length with a 3+2 seating arrangement. These are operated as up to 12-car trains on some parts of the Wessex network by combining three 4-car units together. As previously mentioned, west of Poole there are power supply constraints that mean when Class 450 rolling stock is used the length of the train is restricted to a maximum of 8-cars, but this is only under very specific conditions (see later in this section for details).



Figure 14 - Class 450 'Desiro' 4-Car unit "South Western Railway Class 450" by WestRail642fan is licensed under CC BY-SA 4.0.

CrossCountry Trains services to and from Bournemouth are formed of diesel Class 220 or Class 221 Voyager units which may run in pairs during the peak if required.

Lymington Branch

These services run into Brockenhurst at the eastern extremity of the study area and are operated by SWR. They are usually operated as single 4-car Class 450 units as a shuttle between Brockenhurst and Lymington Pier. Although no service changes are

suggested for this line there is an interface at Brockenhurst which could provide the opportunity for improved connectivity from Lymington to other locations.

Depots and Stabling

South Western Railway's Class 444 and Class 450 units are based at Northam depot near Southampton. Some units are maintained overnight at Bournemouth depot rather than returning to Northam. There are Empty Coaching Stock (ECS) movements within the Bournemouth area throughout the day that can impact the passenger service that can be operated. Some of these ECS



Figure 15 - Northam Depot

movements are related to the need to split and join services to cater for demand east and west of Bournemouth.

CrossCountry Voyager trains are allocated to Central Rivers depot near Burton upon Trent, but sets are stabled at Eastleigh overnight for services starting and finishing at Bournemouth.

Infrastructure

In terms of track infrastructure, the SWML section within the study area of this work is double track railway with two single track sections, one between Moreton and Dorchester South and one in the throat of Weymouth station.

Start of Section	End of Section	Double/Single	Length
Brockenhurst	Moreton	Double	37m 74ch
92m 66ch	130m 60ch		
Moreton	Dorchester South	Single	4m 72ch
130m 60ch	135m 52ch		
Dorchester South	Dorchester Mileage	Double	0m 43ch
135m 52ch	Change		
	136m 15ch		
Dorchester Mileage Change 162m 14ch	Weymouth Junction 168m 35ch	Double	6m 21ch
Weymouth Junction	Weymouth	Single	0m 28ch
168m 35ch	168m 63ch		
		Total Single	5m 20ch (10.5%)
		Total Double	44m 58ch (89.5%)

 Table 6 - Proportion of double to single track on the South Western Main Line

The table above shows the proportion of double to single track on the SWML within the scope area. Although the track is overwhelmingly double track and therefore in theory capable of reasonable service flexibility, it is the small amount of single track that determines the service that is able to be operated. As noted previously, the Moreton Single dictates the service interval operated into and out of Weymouth.

Owing to the topography of the wider Dorset area the SWML, which often curves along the coastline, there are some linespeed restrictions that cannot match the capabilities of the rolling stock which operates on the line.

There are several level crossings on the SWML section of the study area, this includes some high risk level crossings that may impact the ability to increase service levels through the area:

- Poole Level Crossing this has the highest level of protection but remains a high safety risk owing to the number of users
- Wareham Level Crossing a footpath level crossing next to Wareham station with miniature stop lights and a crossing guard. The crossing is impacted by high levels of misuse and has a large number of users
- Moreton an Automatic Half Barrier Crossing close to Moreton station that has poor visibility for road vehicle users, a large number of pedestrian and vehicles users with a lot of HGVs using the crossing as well

More details on level crossing safety and individual level crossings can be found on the Network Rail website:

https://www.networkrail.co.uk/communities/safety-in-the-community/levelcrossing-safety/

It has previously been mentioned that there are power supply constraints to operating longer trains to the west of Poole on the SWML. The line between Bournemouth and Weymouth was electrified in 1988 and it was designed to cater for one 5-car train per hour in each direction. Since then, the service has been increased to 2 x 5-car trains per hour in each direction and the occasional 8-car replacing a 5-car. This was allowed following a 'system test assessment' rather than modelling and theoretical assessment. Modelling and theoretical assessments use assumptions and therefore aren't quite as accurate as carrying out a system test assessment which involves running services and measuring volts and amps. A system test assessment was carried out and it was shown that the 2×5 -car service could be

operated and since then Weymouth has benefited from this level of service without the need for any major power enhancements.

This means that the power capability of the rail system is sufficient for the service that operates today but has been pushed as far as it will go and therefore any change to the service will require some sort of power enhancement to enable that change. Modelling will be required to understand fully the extent and geographic scope of any future power supply upgrade.

There are two main power constraints to operating an enhanced service west of Poole, one external to Network Rail and another related to the design of the system:

- The capacity of the National Grid at that location and the ability of the Distribution Network Operator (DNO) to provide the required level of power
- Network Rail's 11kV High Voltage (HV) cable that carries the power to the DC system (3rd Rail) was designed for the original permitted load and would need replacing

Therefore, power modelling and a potential power upgrade would need to be included in any future development of service changes identified through this strategic study.

In summary, there are a number of constraints on this section of the SWML that may prevent changes in service provision on the line:

- There are a number of locations where the linespeed is constrained owing to the lack of lengthy, straight track sections as the line curves to follow the coastline and topography
- Power supply is a major constraint west of Poole as this limits the number and length of passenger trains that can operate
- Poole and Wareham level crossings impart considerable safety risk and any additional services may lead to increased down time and the risk of members of the public behaving in an unsafe manner
- The 'Moreton Single' is a single track section of the line between Moreton and Dorchester South that is a potential constraint to growth in the quantum of services operated
- Weymouth station throat has a short single line section that may become a constraint if there are aspirations to operate additional services to and from Weymouth

Freight

There is little freight traffic on this section of the SWML with most freight from Southampton Docks heading towards the Midlands and the North. Potential new freight markets, such as express parcel logistics, may provide opportunities to operate freight through Dorset.

There are proposals to refurbish and enhance the rail infrastructure within the Port of Poole to enable marine dredged aggregates and intermodal container train flows in the future from the Port.

There has been aggregates traffic to and from Hamworthy (west of Poole) in previous years, although not currently, and the track and infrastructure is in place to potentially allow the reinstatement of this traffic. There have been recent discussions about potential movements between Hamworthy and the Mendips (Merehead or Whatley quarries).

Aggregates traffic also used to operate from the Wool area and could potentially come back into use should the market require it in alignment with the decarbonisation agenda to get freight off the roads and on to rail. Other freight flows may be required for the decommissioning of the Winfrith facility.

At Furzebrook Sidings, to the north end of the Swanage Railway, between Norden and Worgret Junction, there was a terminal for liquified petroleum gas traffic from



Figure 16 – Furzebrook Sidings

Avonmouth, but this is also no longer in use and may be required for future expansion of the Swanage Railway.

Operational Resilience and Performance

Network Rail uses a metric called Public Performance Measure or PPM to monitor the performance of the rail network and the impact on passengers. PPM is the percentage of trains which arrive at their terminating station 'on time' compared to the total number of trains planned. A train is defined as on time if it arrives at the destination within five minutes (i.e. 4 minutes 59 seconds or less) of the planned arrival time for London and South East or regional services, or 10 minutes (i.e. 9 minutes 59 seconds or less) for long distance services.



The chart on the left shows an increasing trend across the incident count performance measure. Incident counts increased by 1% between period 13 in the year 2018/19 to 2019/20.

Figure 17 - Incidents by period with MAA since 2018/19 on the SWML in the study area



The chart on the left shows an increasing trend across the volume of delay minutes performance measure. This equates to a c.30% increase in delay minutes at 2019/20 P13 from the same period the previous year. However, the incident count, in the previous chart, had only increased

Figure 18 - Delay minutes by period with MAA since 2018/19 on the SWML in the study area



Figure 19 - Passenger Performance Measure (PPM) Failures by period with MAA since 2018/19 on the SWML in the study area

by 1 %. This pattern is also shown in the PPM failures, those that contribute to the PPM figure, see figure 20.

There was again a c.30 % increase in PPM failures against only a 1 % increase in overall incidents, suggesting that the impact of the incidents has been having a worse effect on the rail industry's ability to recover the train service.

This data has also been split into

the categories used for analysing performance incidents and it can be concluded that this section of the SWML has seen high impacting incidents, in terms of delay minutes, from 'External', 'Non-Track Assets' (including signalling), 'Fleet' and 'Track'.



Figure 21 - Total delay minutes by category since 2018/19 on the SWML in the study area.



Figure 20 - Count of Incidents by category since 2018/19 on the SWML in the study area

Although the 'External' incident count was relatively low in 2018/19, these incidents had the biggest impact on delay minutes. Any service improvements suggested by this study that require infrastructure interventions provide an opportunity to reduce the number of incidents seen on this section of the SWML.

3.2.2. Heart of Wessex Line

The Heart of Wessex Line (HoW) is 87m 16ch line between Weymouth and Bristol Temple Meads. The line connects nineteen passenger railway stations, some of which are request stops only owing to the rural nature of sections of the line. The line between Weymouth and Westbury provides the focus of this study.

Service Frequency

The service operated on the Heart of Wessex Line is extremely irregular with intervals between services being at least two hours but often more. This results in an eight train a day service in each direction. The irregularity of service means that times of departure are different for every train making the service inconsistent and unattractive to potential passengers.

It is understood that the main operator of services on this line, Great Western Railway (GWR), have made Direct Award commitments to introduce a standard two hourly frequency on the Heart of Wessex Line, to be introduced from December 2022 (dependent on post-COVID resources).

This two hourly level of frequency can be introduced within the capability of the existing infrastructure and passing places. Discussions with rail industry stakeholders suggest that to increase the frequency beyond this may necessitate the construction of additional loops or double track sections, the locations of which will be identified through this study.

Anecdotal evidence suggests that the current timetable is far from ideal for stakeholders particularly in terms of the lengthy gap in the evening peak from Weymouth and Dorchester northwards. There may therefore be suppressed demand owing to the limited journey opportunities presented by the existing timetable.

In addition, there has been a need to utilise road transport to supplement the service on summer Saturdays owing to the sheer volume of passengers that were unable to be accommodated on the 3-car Class 158, 165 or 166 trains.

When compared to other regional branch lines in the South West of England it can be seen that the Heart of Wessex line has a particularly low service level in comparison (frequency numbers relate to services in one direction). OFFICIAL

Branch Line	Distance	Frequency
St. Erth to St. Ives	4m 16ch	2 tph
Truro to Falmouth	11m 69ch	2 tph
Par to Newquay	20m 43ch	0.5 tph
Liskaerd to Looe	8m 48ch	1 tph
Plymouth to Gunnislake	14m 53ch	0.5 tph
Newton Abbot to Paignton	8m 06ch	2 tph
Exeter St. David's to Exmouth	11m 21ch	2 tph
Exeter St. David's to Okehampton	24m 75ch	0.5 tph from December 2021
Exeter St. David's to Barnstaple (The Tarka Line)	38m 75ch	1 tph
Westbury to Weymouth	58m 79ch	8 trains per day at irregular intervals

Table 7 - Train frequency on comparable branch lines on the GB rail network

Improvements to service levels on the Heart of Wessex Line have the potential to provide a transformational change for people living in the surrounding area, particularly if interchange opportunities were available at key locations for onwards journeys. It could also provide the opportunity to improve the ability for passengers from both Dorset and the South East Dorset City Region to access other areas of the South West more easily by rail. This could help meet the challenges and targets identified through the climate emergencies called by local authorities across the South West of England.

The northern section of the Heart of Wessex line between Castle Cary and Yeovil Pen Mill is used as a diversionary route for GWR and freight services when the main line via Taunton is out of use. Currently, only one train every other hour in each direction is achievable when trains are diverted owing to infrastructure constraints. The West of England Line CMSP has identified some infrastructure interventions to increase capacity to allow 1tph to operate in each direction.

Key Passenger Flows

Analysis carried out for the Heart of Wessex Line (Weymouth to Westbury) as part of this study shows that the top 15 passenger journey flows within the scope area can be seen in the table below. These do not include journeys outside the wider scope area of this study.

Ailes
7m 00ch
27m 41ch
53m 19ch
20m 41ch
5m 60ch
4m 47ch
19m 62ch
7m 51ch
58m 79ch
39m 17ch
10m 49ch
25m 58ch
15m 09ch
11m 56ch
2m 33ch

Table 8 demonstrations that the top flows within the wider study area on the Heart of Wessex Line are a combination of shorter journeys and those over longer sections of the line.

This shows that the line, despite the irregularity of service, is used by passengers for some local journeys, such as those between Weymouth and Dorchester and Castle Cary and Yeovil Pen Mill, as well as those between Yeovil Pen Mill or Castle Cary and Weymouth.

Providing a more regular, possibly 1tph, service on this line would improve the journey experience of current passengers and also encourage new passengers to use the service as well. Provision of a more limited stop service could provide faster journeys between the larger settlements on the line.
Passenger Trends

The Office of Rail and Road (ORR) publishes passenger entry and exit data every year; this can be used to give a view of how passenger trends have changed over time.



Figure 22 - Entries and Exits 2016/17 to 2019/20 on the Heart of Wessex Line, based on ORR data

Analysis of ORR station usage data shows that the patronage figures for stations on the Heart of Wessex Route between Castle Cary and Weymouth have fluctuated in recent years with no clear growth trajectory. Some of this may be linked to issues with unreliability of the GWR service in 2017 and strike action on SWR. It may be that the relatively unattractive timetable has limited growth on this route compared to others elsewhere on the Wessex and Western Routes that saw growth over the period 2010 to 2019.

It should be noted that rail usage fell dramatically during 2020 as the implications of COVID-19 took effect, there was some recovery during the summer in between lockdowns.

COVID-19 and the associated lockdowns and other restrictions have led to a substantial reduction in rail travel since March 2020. It is far from clear what the long term impact of this will be on the UK economy and when the demand for rail travel, both peak and off peak, may return. Early signs are that regional and leisure

travel are returning faster than commuting into locations such as London or other major city locations.

Rolling Stock

Great Western Railway (GWR) operate the Heart of Wessex Line services using a mixture of Class 158 and Class 165 or 166 Turbo units between Bristol Temple Meads and Weymouth. On occasions of peak demand on summer Saturdays, services may be strengthened with additional units used. Class 158, 165 and 166 rolling stock are made up of 2 or 3-car units, with each car being approximately 23m in length. These are Diesel Multiple Units (DMUs) and are capable of speeds of between 75mph and 90mph. The maximum line speed of the Heart of Wessex Line is 75 mph which means that there is no advantage in utilising rolling stock with a higher maximum speed at this time.



Figure 23 - Class 165 3-car unit "GWR Class 165/1 3 Car" by WestRail642fan is licensed under CC BY-SA 4.0.

Many journeys to and from Weymouth go beyond Bristol Temple Meads, for example to Gloucester, so several units are used on this line each day as opposed to one train shuttling backwards and forwards. This is the result of trying to make best use of the available platform capacity at Bristol Temple Meads by running services across the city as opposed to having lengthy turnarounds in the station platforms. It should be noted that passengers' destinations may not be in Bristol City Centre, for which they would use Bristol Temple Meads, as there are significant movements to and from Filton Abbey Wood on the north side of the city which serves MoD Abbey Wood and the University of the West of England.

Depots and stabling

The GWR rolling stock on this line is diesel and therefore has to be refuelled. There are no existing refuelling facilities for GWR at Weymouth therefore rolling stock currently has to travel to locations where they can be fuelled such as Bristol St. Philip's Marsh deport or Westbury. There is also no depot at Weymouth where examinations and routine maintenance can be carried out, hence all maintenance is carried out away from the Weymouth or Dorchester areas. There is no alternative facility operated by SWR in that area with the nearest diesel depot at Salisbury.

Infrastructure

In terms of track infrastructure, the Heart of Wessex Line that forms the scope of this strategic study (Weymouth to Westbury) is a mixture of single and double track railway.

Start of Section	End of Section	Double/Single	Length
Westbury station 109m 64ch	Castle Cary junction 129m 50ch	Double	19m 66ch
Castle Cary junction 129m 50ch	Yeovil Pen Mill 141m 06ch	Single	11m 36ch
Yeovil Pen Mill 141m 06ch	Pen Mill Junction 141m 35ch	Double	0m 29ch
Pen Mill Junction 141m 35ch	Maiden Newton 154m 02ch	Single	12m 47ch
Maiden Newton 154m 02ch	Maiden Newton 154m 27ch	Double	0m 25ch
Maiden Newton 154m 27ch	Dorchester West 161m 55ch	Single	7m 28ch
Dorchester West 161m 55ch	Weymouth Junction 168m 35ch	Double	6m 60ch
Weymouth Junction 168m 35ch	Weymouth 168m 63ch	Single	0m 28ch
		Total Single	31m 59ch (53.2%)
		Total Double	27m 20ch (46.2%)

Figure 24 - Proportion of double to single track on the Heart of Wessex Line

The section between Castle Cary Junction and Dorchester West is single track infrastructure, with passing loops at Yeovil Pen Mill, Maiden Newton and a double track section between Dorchester West and Weymouth Junction at which there is a short single track section. Between Castle Cary Junction and Westbury, the line is double track except where there are additional loops at Castle Cary and Frome (the 'Frome Single'). The line, particularly through Dorset, has some steep gradients that can impact the line speed achievable on the line.

There are a high number of level crossings on the line through rural Dorset and Somerset, the vast majority of which are footpath level crossings. Level crossings can often be a cause of line speed restrictions, particularly where topography or other infrastructure constraints mean sighting for pedestrians crossing the line is limited.

More details on level crossing safety and individual level crossings can be found on the Network Rail website:

https://www.networkrail.co.uk/communities/safety-in-the-community/levelcrossing-safety/ Although the line connects with the DC/3rd rail network in the Dorchester area it is not itself electrified north of Dorchester Junction.

Between Weymouth and just north of Maiden Newton the line's signalling is controlled from Dorchester South signal box; from just north of Maiden Newton to just south of Castle Cary Junction the line is controlled from Yeovil Pen Mill signal box which is via a mechanical token system; from just south of Castle Cary to Westbury the line is controlled from Westbury signal box.

In summary, there are a number of constraints the Heart of Wessex Line that may prevent changes in service provision on the line without infrastructure intervention:

- There are a number of locations where the line speed is constrained owing to the topography and gradients through the area which limits the line speed to 75mph
- The area signalled by the Yeovil Pen Mill signal box requires all trains to stop at Yeovil Pen Mill and Maiden Newton for token working
- The line between Castle Cary and Weymouth is predominately single track with passing loops at Maiden Newton and Yeovil Pen Mill
- There are a large number of footpath and user worked level crossings that may need upgrading or closure
- Services interact with other lines such as the 'Berks & Hants' at Castle Cary and several lines at Westbury that may constrain the ability to improve services

<u>Freight</u>

There is no timetabled freight on the Heart of Wessex Line itself. However, the northern section of the line between Castle Cary and Yeovil Pen Mill is used as a diversionary route for GWR and freight services when the main line via Taunton is out of use owing to engineering works or extreme weather.

It should be noted that the Heart of Wessex line passes through Westbury which is a major centre for aggregates traffic from Whatley and Merehead quarries.

The whole line supports W6a gauge route clearance of freight vehicles with some restrictions (see <u>Sectional Appendix</u> for details).

Operational Resilience and Performance

Network Rail uses a metric called Public Performance Measure or PPM to monitor the performance of the rail network and the impact on passengers. PPM is the percentage of trains which arrive at their terminating station 'on time' compared to the total number of trains planned. A train is defined as on time if it arrives at the

destination within five minutes (i.e. 4 minutes 59 seconds or less) of the planned arrival time for London and South East or regional services, or 10 minutes (i.e. 9 minutes 59 seconds or less) for long distance services.



Figure 25 - Heart of Wessex Line incidents by Period with MAA Since 2018/19



Figure 26 - HOW Line delay minutes by period with MAA since 2018/19.



Figure 27 - HOW Line PPM failures by period with MAA since 2018/19

The chart on the left shows a reducing trend across the incident count performance measure. Incident counts decreased by 9% between period 13 in the year 2018/19 to 2019/20.

The chart on the left shows an decreasing trend across the volume of delav minutes performance measure. This equates to a c.28% reduction in delay minutes at 2019/20 P13 from the same period the This is quite previous year. considerable for a reduction in incidents of 9%.

This pattern is also shown in the PPM failures, those that contribute to the PPM figure, see figure 27.

There was a c.30% increase in PPM failures against only a 9% increase in overall incidents, suggesting that although incidents were still occurring, they were having a smaller **impact.**

This data has also been split into the categories used for analysing performance incidents and it can be concluded that the Heart of Wessex Line has seen high impacting incidents, in terms of delay minutes, from 'External', 'Non-Track Assets' (including signalling), 'Fleet' and 'Track'.

Although 'Fleet' clearly has the largest volume of delay minutes it is not the highest cause of incidents, this indicates that the delay per incident for Fleet events may be higher than some other categories and that incidents tend to have a larger impact.





Figure 29 - Count of Incidents by category since 2018/19 on the Heart of Wessex Line in the study area



Given that Weymouth is a long way from Bristol and to an extent isolated from other GWR services, if a unit fails in the southern part of the line there is limited scope to deal with it quickly as the nearest replacement units may be as far away as Westbury.

Providing a standard clockface pattern and a more regular service would be likely to make it easier to operate with any emergency arrangements at times of perturbation. This would also be a more attractive service to potential users and easier to understand in terms of knowing when the next service is.

Although in an ideal world there would be funding available to reinstate the double track throughout the line, additional double track sections particularly in the Castle Cary and Yeovil Pen Mill areas would be of considerable benefit operationally by providing additional flexibility. It is understood that additional services operated during summer 2012, when Weymouth was a venue for the Olympics sailing events, proved extremely challenging to operate reliably on the Heart of Wessex Line.

4. Wider Dorset Area: Economy and Connectivity

4.1. Dorset Economic Overview

The wider Dorset area is characterised by the urban Bournemouth Christchurch and Poole conurbation (the 10th largest urban area in the UK, as stated on the Dorset LEP website) and the more rural Dorset area with key market towns such as Dorchester and Weymouth. This means that Dorset has a varied economic picture with different opportunities for growth and challenges to building that growth.

The Dorset LEP's *Draft Local Industrial Strategy* states the following headline statistics:

- 795,000 population (which broadly align to other figures stated in this study)
- £17.3bn Gross Value Added (GVA)
- 31,900 businesses

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As can be seen in Figure 30 the wider Dorset area has several natural and built assets that have the potential to impact transport; and more specifically rail.



Figure 30 - Significant natural and built assets across Dorset (Dorset LEP, Draft Local Industrial Strategy 2019)

Dorset is an area exhibiting many of the 'problems of success' ⁹:

- Advanced in demographic ageing
- A wide range of wealth and inclusion
- Shortages on skills replacement and renewal
- A difficult housing affordability issue
- In need of updated and expanded infrastructure whilst delivering against a commitment to carbon neutrality

Improved transport links could help tackle the above 'problems of success' by providing better access to employment across a wide geographical area, including Southampton, Bournemouth, Christchurch and Poole, Bath and Bristol, thereby bringing opportunities to Dorset.

4.1.1. The Impact of an Ageing Population

Dorset is recognised as an area with a population demographic that is ageing. The area currently has a higher than average proportion of citizens aged over 65 when compared to the rest of the country, with much of the population growth in the area forecast to be in this age group during the period of this strategy (to 2038). 80% of all population growth in South East Dorset from now until 2041 is expected to be in the over 65s¹⁰.

Dorset has the oldest population and lowest proportion of under 50s, anywhere in the UK¹¹:

- By 2025, almost 40% of the Dorset population could be over 60 (compared with under 25% in England)
- By 2035 Dorset will face a potential vacancy replacement of half its current workforce over 100,000 employees
- By 2040 it will have a dependency ratio of 1 (that's one person working for every person of pensionable age)

The Dorset Local Plan notes that in Dorset there is an above average proportion of the population aged over 65.¹² This would appear to provide an opportunity for rail and public transport operators, given that such people may be more inclined to give up driving particularly when offered free bus travel through the England National Concessionary Travel Scheme (ENCTS) and when using Senior Railcards which offer

⁹ Dorset Local Enterprise Partnership, *Draft Dorset Local Industrial Strategy* (2019), 9.

¹⁰ Dorset Local Enterprise Partnership, *South East Dorset Urban Mobility Study* (2020), section 1.2.

¹¹ Dorset Local Enterprise Partnership, *Draft Dorset Local Industrial Strategy* (2019), 9.

¹² Dorset Council, *Local Plan Consultation* (2021), section 1.3.19.

discounted rail travel. This could be an opportunity to generate demand at off-peak times.

4.1.2. Housing Affordability, Availability and Deprivation

In addition, there is the recognition that housing affordability in Dorset is an issue. This lack of affordable housing is a particular issue for Dorset in respect to the need to encourage the younger demographic to remain in the area or move into the area. Improving the amount of affordable housing could result in an increase to productivity and skills in the area by increasing the working age population. Aspirations for Dorset to be at the forefront of digital technology and business could be disadvantaged by a lack of affordable housing for a potentially younger workforce demographic.

There is a high proportion of second home ownership in parts of Dorset, particularly those areas that are of a rural nature, with spectacular landscapes and proximity to the coast. This is highlighted in the following map:



Figure 31 - Proportion of 2nd Homes per area with Dorset (Dorset Local Plan Consultation, January 2021)

In 2016 Dorset had the lowest rate of working age resident population in the Western Gateway area (52%). The average for Western Gateway is 57% and for

England 58%.¹³ The Western Gateway Sub-national Transport Body argues that attracting and retaining businesses within the Western Gateway area is of paramount importance to ensure the number of working age people increases. Transport has a role in this and improving regional connectivity will be vitally important.¹⁴

There is a high proportion of second home ownership in parts of Dorset, particularly those areas that are of a rural nature, with spectacular landscapes and proximity to the coast. This is highlighted in the following map.

The Dorset Local Plan consultation, January 2021, suggests that high levels of second homes can impact on local communities in various ways including increases to house prices. However, the picture is often more complex as demand for housing arises from a number of sources including those moving to an area to retire, and for work, as well as those buying a second home. The often rural nature of where second homes are located can mean that when combined with restrictions to development on Green Belt land there is a lack of housing availability and growth opportunities in these locations, which could impact towns such as Wareham, Wool and Moreton. Building on sites close to the railway, particularly brownfield sites, may be a means of mitigating against these restrictions.

The Government is keen to see additional housing in the Bournemouth, Christchurch and Poole Council area. It is suggested that over 42,000 additional houses will have to be provided by 2038, although it has been suggested that a lower figure might be more appropriate.¹⁵ The Dorset Local Plan states that there is an unmet housing need figure of 30,481 dwellings in Dorset which may increase to take account of neighbouring authorities (2.2.5 onwards).¹⁶

In Central Dorset it is proposed to continue the previous policy of significant development in the Weymouth and Dorchester areas including Poundbury near Dorchester. There are also plans for major growth at Crossways near Moreton station. In the North Dorset area substantial growth is proposed for Gillingham and Sherborne, which are both served by rail, and less growth at settlements away from the railway at Shaftesbury, Sturminster Newton and Stalbridge. In Western Dorset there are plans for expansion at Bridport, Lyme Regis and Beaminster. None of these locations are currently rail served but there may be scope for improved bus links to and from railheads. Locations on the edges of the Bournemouth, Christchurch and

¹⁴ Western Gateway Sub-national Transport Body, *Regional Evidence Base Part 1 Story of Place* (2019), section 5.19.

¹³ Western Gateway Sub-national Transport Body, *Regional Evidence Base Part 1 Story of Place* (2019), section 3.5.

¹⁵ BCP Council, A Local Plan for Bournemouth, Christchurch and Poole Issues and Options Consultation (August 2021) ¹⁶ Derset Council, Local Plan Consultation (2020) soction 2.2.4

Poole Council area, such as Ferndown could also see considerable housing development.

Improvements in the affordability and location of housing (closer to the railway) and their related demographic changes could also influence the type and mode of



Figure 32 - Index of Multiple Deprivation National Rank (Western deprivation Gateway, Economic Connectivity Study, 2019)

journeys being made across Dorset e.g. a younger population may rely more on public transport modes than the private car. It is important that housing that has good access to the railway has a significant level of affordable housing to improve access to jobs across the wider Dorset area. This is important in areas with relative deprivation, such as Weymouth, Poole, and Bournemouth (shown in red and hues), where orange access to employment and education is essential to the levelling up of communities. It is likely that there are also smaller pockets of rural deprivation across the wider Dorset area that are not necessarily shown in the Figure 32 data. Providing improvements to rail services, particularly in these areas of could help reduce deprivation by providing communities

47

and workforces in these areas with much better access to the major centres of employment.

Fourteen neighbourhoods in Dorset are in the most deprived 20% nationally for employment.¹⁷ Ten of these are in the former borough of Weymouth and Portland, now part of the Dorset Council area. Providing affordable housing and connecting these communities to the wider Dorset and South West area for employment opportunities, including by rail, could be transformative in terms of reducing social exclusion and levelling up in these areas.

¹⁷ Ministry of Housing, Communities & Local Government, *English Indices of Deprivation* (2019)

4.1.3. The Importance of Tourism

Dorset is heavily reliant on tourism for its economic success, with 30,035,000 day and overnight visitors in 2019 and 11% of all employment in Dorset is linked to tourism.¹⁸ In the Bournemouth, Christchurch and Poole area there are 15 million visitors annually spending £800m and there are 19,000 tourism jobs.¹⁹



Figure 33 - Dorset key facts at a glance (Dorset Tourism Partnership, The Economic Impact of Dorset's Visitor Economy (2019))

In November 2020 the Dorset Tourism Partnership published some analysis looking at the impact of the leisure market on the economy of the wider Dorset area in 2019.

This analysis, published by Dorset Tourism Partnership (above), shows that 11% of all employment in the wider Dorset area is related to tourism and that more than £1.8bn was spent by visitors to the area. The impact of the COVID-19 pandemic, with potentially more people taking holidays in the UK, could see growth in this market over the next few years as the nation comes out of the pandemic.

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¹⁸ Dorset Tourism Partnership, *The Economic Impact of Dorset's Visitor Economy 2019* (2019), Dorset – Key Facts at a Glance.

¹⁹ BCP Council, A Local Plan for Bournemouth, Christchurch and Poole Issues and Options Consultation (August 2021)

The leisure and tourism market in the wider Dorset area includes the following attractions:

- The Jurassic Coast is a UNESCO World Heritage Site
- Locations such as Weymouth, Poole and Bournemouth attract day trippers and holidaymakers accessing the beaches
- The Swanage Railway draws people to Wareham for onwards connectivity to the heritage railway
- Poole Harbour for water sports
- The Isle of Purbeck is a big attraction for walkers and those wishing to experience the coastline
- Rural Dorset attracts holidaymakers to villages and the wider countryside



Figure 34 - Durdle Door on the Jurassic Coast

Some aspects of the tourism market and some specific attractions within the wider Dorset area will be seasonal and the need for increased frequency of public transport services during those times may be required to support connectivity and economic growth in this sector. The Dorset Local Enterprise Partnership state that the tourism sector is not as productive as it could be and therefore there is scope for growth. With 72% of businesses across the tourism sector wanting to grow and improve their productivity levels the need to attract visitors all year round is important.²⁰ Getting those visitors to the wider Dorset area and helping them to move around in a sustainable way once they are there could be key to improving productivity. Integrating public transport modes, improving frequencies and reliability can encourage visitors to be more sustainable in their transport choices.

A 2014 holiday and day trip survey conducted by Visit England showed that 23% of all holidays and 40% of trips to the coast are to locations in the South West of England. Of these journeys approximately 15% are made by public transport, which are likely to be predominantly made by rail. Visit England identifies several locations within the study area to be some of the most visited in England:

- Bournemouth (11th) 500,000 annual visitors
- New Forest (12th) 500,000 annual visitors
- Weymouth (20th) 400,000 annual visitors

These locations represent a notable portion of the total tourism travel to Dorset and Hampshire. They all have good rail links, and this indicates that other locations with good rail links could also become popular tourism destinations.

4.2. The Regional Connectivity Problem

A lack of quality interchange facilities across Dorset and the South East Dorset conurbation presents a barrier for potential passengers using linked modes, such as bus and rail, as a mode of choice their journey.

A consequence of the historical development of the national rail network is the poor linkages to the South West and the lack of through services between the South East Dorset conurbation and the Bristol/Bath area.²¹ There is also a lack of rail connectivity through to other areas of the South West such as Exeter for onwards travel to Plymouth and Penzance which has resulted in road travel being the most convenient mode for such journeys.

As well as longer distance regional connectivity it is also important that shorter journeys are catered for by an integrated transport system that includes rail, particularly for leisure and commuting journeys. By switching to public transport or

²⁰ Dorset Local Enterprise Partnership, *Draft Dorset Local Industrial Strategy* (2019), 26.

²¹ Bournemouth Borough Council, Borough of Poole and Dorset County Council, *Bournemouth, Poole and Dorset Local Transport Plan 3* (2011), section 3.4.

active travel modes connectivity can be improved and localised congestion and pollution issues mitigated, as well as improvements to economic productivity.

4.2.1. Comparing regional connectivity - Road/Rail

Through this strategic study, local stakeholders have raised concerns about the lack of wider rail connectivity to and from the wider Dorset area, in particular, the Bournemouth, Christchurch and Poole area and neighbouring urban areas. Although there are regular rail services to London (although slower than some from some other locations a similar distance from London), and regular services to the Thames Valley, Birmingham and beyond, the lack of direct rail links to either the South West or the West Country areas makes rail relatively unattractive as a mode, with journey planners giving circuitous routes via either Weymouth, Southampton, Salisbury or Reading. This partly reflects the effects of the Beeching cuts in the 1960s that led to the closure of the former Somerset and Dorset Railway line from Bournemouth to Bath and Bristol (with connections to the South West at Templecombe) and the fact that the proposed railway line between Dorchester and Exeter was never built in the nineteenth century. The Somerset and Dorset Railway was 71 miles long from Bournemouth to Bath and was a much shorter distance than by the remaining railway lines between those locations.

When looking at the time taken to travel the shortest distance between Bournemouth and Exeter St. David's by rail the distances are as follows:

Origin	Destination	Mileage
Bournemouth (108m 02ch)	Weymouth (142m 64ch)	34m 62ch
Weymouth	Yeovil Pen Mill	27m 41ch
Yeovil Pen Mill	Yeovil Junction	1m 59ch
Yeovil Junction (39m 05ch)	Exeter St. David's (88m 49ch)	49m 44ch
Total		111m 206ch
		= 113m 46ch

Table 9 - Rail distances between origins and destinations in the study area

The fact that the minimum rail distance between Bournemouth and Exeter is 113 miles as opposed to 83 miles by road, indicates the difficulty that rail faces in trying to compete with the private car between the Bournemouth area and South West England.

Using an online journey planner, a road journey between Bournemouth and Exeter (83 miles via the A35 and A30) is shown to take approximately 2 hours 30 minutes. There are no regular direct National Express coaches between these locations so the

only real alternative to the private car is rail travel. If travelling by coach the journey could take 5 hours and 55 minutes with a change at Bristol. At the time of investigation, journey planners were quoting a minimum rail journey time of 4 hours and 55 minutes. The journey can be shortened to approximately 3 hours and 20 minutes by rail if the route via Southampton and Salisbury is used.

In terms of journeys between Bournemouth and Bristol the route via Weymouth using the SWML and Heart of Wessex Line can be seen to be approximately 121 miles.

Origin	Destination	Mileage
Bournemouth (108m 02ch)	Weymouth (142m 64ch)	34m 62ch
Weymouth	Bristol Temple Meads	87m 16ch
Total		121m 78ch

Table 10 - Rail distances between Bournemouth and Bristol via Weymouth

Making the same journey but travelling via Southampton and Salisbury is actually 16 miles shorter than travelling via Weymouth.

Origin	Destination	Mileage
Bournemouth (108m 02ch)	Southampton Central (79m 19ch)	28m 63ch
Southampton Central (25m 69ch)	Salisbury (49m 54ch)	23m 65ch
Salisbury	Bristol Temple Meads	52m 60ch
Total		105m 28ch

Table 11 - Rail distances between Bournmouth and Bristol via Salisbury

Again, using an online journey planner the most direct road journey in terms of distance is via the A350, is 76 miles and takes approximately 2 hours and 25 minutes. A longer journey in terms of distance can be made via the M4, 130 miles, but in the shorter time of 2 hours and 16 minutes owing to the speed achievable on the motorway sections of the route. Rail journeys via Weymouth can take between approximately 3 hours and 25 minutes and 4 hours and 24 minutes depending on the interchange time at Weymouth. When travelling by rail via Southampton Central to Bristol Temple Meads the journey time is approximately 2 hours and 27 minutes.

These examples show the unattractiveness of rail when compared to road travel for journeys between the largest urban area within the scope of this strategic study and key regional centres. It was also shown that rail travel via Southampton Central can provide journey time savings, in part owing to interchange times at Southampton Central being better than those at Weymouth. The irregular service interval at OFFICIAL

Weymouth between SWR and GWR services means there is a wide range of journey times when using that route to connect to Exeter St. David's or Bristol Temple Meads.

Strategic studies being developed by National Highways, including the 'M4 to Dorset Coast Strategic Study', have provided an opportunity for the rail industry and National Highways to consider jointly whether any changes to the Strategic Road Network (SRN) or railway would improve connectivity and support wider local/regional policy ambitions.

Additional analysis focussed on the South East Dorset conurbation, produced as part of the Network Rail 'Main Line Phase 2' strategic study, can be seen in the graph below.



Figure 35 - Comparison of road and rail journeys in the South East Dorset conurbation

The graph shows a comparison of journeys between Bournemouth (BMH) and Poole (POO), Bournemouth (BMH) and Christchurch (CHR), Poole (POO) and Christchurch (CHR) and Bournemouth (BMH) and Southampton Central (SOU). It can be seen that the blue block relating to a wait time penalty causes rail journeys to be uncompetitive with the road. This wait time penalty can be reduced by increasing frequency of rail service and thereby improving the competitiveness of rail.

4.2.2. Commuting patterns – All Modes

For shorter regional journeys, across the strategic study scope area, commuting provides a good example of usage patterns. The following map includes data taken from the 2011 Census relating to use of rail for commuting.



Figure 36 - Rail mode for commuting

This lack of rail connectivity, amongst other contributing factors, may be seen to manifest in the level of car usage for commuting across the wider Dorset area as shown in the 2011 Census data below.



Figure 37 - Car mode for commuting

Levels of car ownership vary across South East Dorset, reflecting the area's diverse geography and demographics. 80% of the population live in a household with at least one car, meaning that at least 20% of people have to rely upon walking, cycling, scooting, wheelchairs and/or public transport to travel. Rural and inter-urban areas have the highest levels of car ownership per household, with the lowest levels of car ownership per household, with the lowest levels of car ownership in the most densely populated urban areas, including areas of Poole, Bournemouth and Christchurch.²²

There are some key conclusions that can be drawn from these two maps.

The South West Main Line (SWML) is used more by rail commuters in comparison to the Heart of Wessex Line, but is still relatively lightly used when compared to areas closer to London; this could be for several reasons:

- The South East Dorset conurbation as a key commercial centre for the region will attract people from the surrounding area some of which will use rail, particularly if they live along the rail corridor as this provides the most direct east-west connectivity
- Some potential passengers within the South East Dorset conurbation may use active travel or other modes, such as bus, to access their place of work (see figures 38 and 39, below)
- Passengers from the South East Dorset conurbation and eastward are more likely to travel by rail for commuting into London Waterloo
- The railways of Dorset are around the edges of the county and therefore many commuters who are travelling more locally for their work journey are likely to remain in their private car rather than drive to a railway station from central Dorset to then travel by rail for only a few stops to their place of work
- The Heart of Wessex Line is very lightly used for commuting; this could be for several reasons: The irregular service pattern that is offered on the line sometimes one train every two hours, sometimes longer. There are also issues around the evening peak when there is a lack of services to get passengers home from work
- Performance and reliability the timetable for this service is regulated around timings at Bristol Temple Meads and therefore issues in that area can see services stopped short to maintain the service at the Bristol end of the line

²² Dorset Local Enterprise Partnership, *South East Dorset Urban Mobility Study* (2020), section 1.2.

- The time that services arrive at key areas of employment, such as Yeovil Pen Mill, which are not conducive to commuting
- The population density of the area many of the stations along the line are in relatively sparsely populated rural areas

Bus travel and active travel modes form an important aspect of the sustainable transport package offered to residents of the wider Dorset area, see Figures 37 and 38.



Figure 38 – Bus mode for commuting

Bus travel for commuting can be seen to be extremely low in the central Dorset area, which is unsurprising when compared to the level of car usage in Figure 38. This may in part be as a result of a lack of onward travel options by bus. Increasing take-up of this mode by rail passengers for accessing the railway could be key in providing a sustainable end to end journey into the BCP conurbation and easing areas of road congestion.

Dorset Council and Bournemouth, Christchurch and Poole Council are, in response to the National Bus Strategy, producing Bus Service Improvement Plans (BSIP) that could provide an opportunity for the rail and bus industries to work together in partnership to achieve sustainable end to end journeys through improved frequency and connectivity.



Figure 39 – Active travel mode for commuting

Active travel modes, such as walking and cycling, are more prevalent for commuting in areas along the SWML through the conurbation, which is to be expected in an urbanised area. In the central area of Dorset there are also some areas, such as Blandford Forum, where active travel is relatively high. Increasing the levels of public transport, including rail, and active travel modes along the rail corridors is very important in terms of sustainability and in reducing congestion, which can be a barrier to connectivity, in the more urban parts of the study scope area.

4.2.3. Bus Travel

The current situation in terms of bus services in the Dorset area is that the main operators include:

- Go South Coast trading as Purbeck Breezer in the Swanage area, More Bus in the Bournemouth area, and Salisbury Reds in the Salisbury area
- Yellow Buses in the Bournemouth, Christchurch and Poole area
- First Wessex buses in the Weymouth area

The bus network is predominantly commercial with limited local authority funding for subsidised bus services over and above the commercial network. For those without access to private cars, who rely on public transport, the bus services in and around Dorset is relatively sparse, reflecting years of funding constraints and rising costs of operation exacerbated by driver shortages. Owing to the railway lines in the wider Dorset area only serving the corridors along the edges of the area bus travel can be an important way for potential rail passengers to access the railway by a sustainable mode. This is particularly significant for people without a private car in rural area or in terms of connecting relatively deprived areas of the wider Dorset area to employment opportunities.

The pre-COVID bus network and how it connects into the railway network can be seen in the following map. It is worth noting the lack of connectivity into the Heart of Wessex Line in particular.



Figure 40 - Wider area transport network for Dorset, Dorset Council

In the South East Dorset conurbation and the Dorchester and Weymouth areas there are networks of high quality and frequent urban bus services. There are also some high quality bus services that operate between larger towns; however, this is not necessarily the case everywhere. Analysis has been undertaken to identify gaps in the rural bus network, focusing on the larger villages with population of 2,000 or more at the time of the most recent published census data from 2011. The following settlements with a population of over 2,000 did not at the time of investigation have an hourly bus service:

Shaftesbury	Lytchett Matravers	Stalbridge
St. Leonards and St. Ives	Alderholt	Bradpole
Sturminster Newton	Charminster	Bothenhampton
Burton	Beaminster and Mapperton	

Table 12 - Settlements with a population over 2,000 but without an hourly bus service

The implication of this is that there may be scope in targeting additional Government funding for rural bus services for the provision of links between the above settlements and railheads to connect to the improved rail services identified in this study.

Although it is accepted that there has been major disruption to bus services since March 2020, owing to COVID, and therefore some of the frequencies and services identified may be augmented, as restrictions ease there are clearly a number of settlements in Dorset above 2,000 population that do not have an hourly bus service. Those settlements highlighted above may be worth targeting for frequency enhancements in the event of increased funding becoming available through the proposed Enhanced Partnership arrangements.

The Government's 'National Bus Strategy' under the title 'Bus Back Better' provides an opportunity for all of those involved in public transport, across all modes, to work together to find public transport solutions that are fully integrated and provide the most efficient and reliable journey options.

4.2.4. Road Traffic Congestion

Congestion on the UK's roads not only impacts journey times for those travelling by car but impacts the attractiveness of public transport and active travel modes as well as impacting health through increased pollution and stress levels. Importantly, traffic congestion can be a barrier to the economic productivity of a region and therefore mitigating congestion has clear economic benefits as well.

In 2007 the Organisation for Economic Co-operation and Development (OECD) published a report called 'Managing Urban Traffic Congestion' that identified the contribution that a high quality public transport system can make to congestion issues:

"The promotion of public transport remains a fundamentally important congestion management strategy. When public transport provides a quality of service that approximates that which car drivers have previously been used to, it can maintain a high level of access throughout urban areas with a drop in overall car usage."²³

The urban areas within the geographic scope of this study are known to have road traffic congestion issues, particularly in locations such as Dorchester, the South East Dorset conurbation and Weymouth. According to the South East Dorset Urban Mobility Study someone living in South East Dorset is expected to spend 6 days per year in traffic congestion.²⁴

Data produced by INRIX in 2019 (pre-COVID) identified the A338 through Bournemouth as the second most congested non-London road in the UK, as can be seen in the table below.

RANK	СІТҮ	ROAD NAME	FROM	то	DAILY DELAY (MINUTES)	YEARLY DELAY (HOURS)
1	Birmingham	A38	Northfield	Lancaster Circus	8	32
2	Bournemouth	A338	Hurn Road	St. Paul's Road	8	32
3	Edinburgh	A90/A902	M90	A901	7	28
4	Leeds	M62	A1(M)	M621	6	24
5	Birmingham	M5	M6	A38	6	24
6	Manchester	A5103	M60	Mancunian Way	6	24
7	Liverpool	A5047	M62	A580	6	24
8	Edinburgh	A702	A720	A700	5	20
9	Manchester	A56	A560	M60	5	20
10	Manchester	A663	A627	A62	4	16

 Table 13 - 10 Most Congested UK Roads Outside London in 2019, INRIX

Bournemouth, Christchurch and Poole Council and Dorset Council were jointly awarded £79m by DfT through the Government's Transforming Cities Fund (part of the Government's Industrial Strategy). The South East Dorset City Region Transforming Cities Fund (TCF) Executive Summary highlights the damaging impact on the area's productivity owing to congestion and poor connectivity, in particular:

²³ OECD, Managing Urban Traffic Congestion (2007)

²⁴ Dorset Local Enterprise Partnership, *South East Dorset Urban Mobility Study* (2020), section 1.3.

- Bournemouth is the 3rd most congested city region in the UK and the 56th most congested place in the world²⁵
- Traffic volumes increased by approximately 4 % from 2011 to 2018, whilst at the same time peak hour motor vehicle journey times increased by approximately 20% over the same period
- East Dorset has the highest car ownership levels in England and Wales
- 56% of BCP Council residents drive five or more days a week
- Journey times for buses between centres are too long making their use less attractive
- Tackling Congestion only has a 42% public satisfaction rating within the BCP Council area

The TCF work being taken forward by BCP and Dorset Councils to address these challenges includes a focus on six sustainable travel corridors as shown in the map in Figure 41, below.



Figure 41 - TCF Sustainable Transport Corridors, BCP Council website

²⁵ BCP Council, *Transforming Cities Fund South East Dorset City Region*, Executive Summary.

Along these corridors cycling, walking and bus improvements will be made that offer an opportunity for the rail industry and local authorities to work together to make improvements to travel integration across the South East Dorset City region.

Road traffic congestion, particularly in the South East Dorset Conurbation, could be seen to be exacerbated by the availability of cheap car parking charges. Low car parking charges incentivise travellers to drive their car into town orcity centres as the cost can be cheaper than a return bus fare or rail fare. Public transport improvements delivered through the TCF programme or subsequently through the options identified in this strategic study should also consider the impact car parking provision can have on modal shift to more sustainable modes.

5. A Vision for Improving Connectivity

It is clear that improved public transport provision and better multi-modal integration can play a role in raising economic productivity, meeting decarbonisation targets, reducing road traffic congestion, lowering pollution levels and improving wellbeing. This study has sought to identify how improvements to the rail service in the wider Dorset area could help to achieve better connectivity and integration between modes.

Analysis carried out for the Solent Connectivity CMSP (<u>LINK</u>), by Solent Transport, demonstrated the link between frequency of rail service and rail demand (see section 6.1 of the Solent Connectivity CMSP).

The Western Gateway Sub-national Transport Body have set out in their Rail Strategy five themes that improvements to rail should align to. Based on these themes and discussion with stakeholders, the table below shows how rail frequency/connectivity improvements can support the achievement of the five themes.

Theme	Objective	Output
Choice	To make rail a realistic and viable option for journeys to, from and within Dorset and adjacent counties	Rail service frequency improvements on the South West Main Line, Heart of Wessex Line and West of England Line to improve journey opportunities
Decarbonisation	To enable rail to contribute more actively towards the decarbonisation of Dorset and adjacent counties	Rail service frequency improvements on the South West Main Line, Heart of Wessex Line and West of England Line to encourage modal shift from the private car and integration with other public transport and sustainable modes

Theme	Objective	Output
Social Mobility	To provide equal journey opportunities by rail for all residents of Dorset and adjacent counties	Rail service frequency improvements on the South West Main Line, Heart of Wessex Line and West of England Line to provide improved access to employment and education
Productivity	To enable rail to contribute more actively to improvements in productivity across Dorset and adjacent counties	Rail service frequency improvements on the South West Main Line, Heart of Wessex Line and West of England Line to provide improved links to other regional economic hubs
Growth	To enable rail to provide sustainable travel options for housing and job growth across Dorset and adjacent counties	Rail service frequency improvements on the South West Main Line, Heart of Wessex Line and West of England Line that align to areas of housing and employment growth providing alternative sustainable transport options to private car use

Table 14 – How rail frequency/connectivity improvements can support the achievement of the five themes identified by the Western Gateway Sub-national Transport Body

Following extensive consultation with stakeholders across the study area, timetable analysis was carried out for both the SWML and the Heart of Wessex Line to test the capability of the rail network to operate additional train services and therefore increase service frequency. Different levels of service were tested to provide for the following:

- 1. Provision of an hourly train service on the Heart of Wessex Line between Bristol Temple Meads and Weymouth, variations on this service level were considered:
 - a. Direct via the existing route

- b. Via Yeovil Junction using a new south chord between the Heart of Wessex Line and the West of England Line
- c. A 'fast' service every other hour with a limited stopping pattern
- 2. Provision of an additional two trains per hour through the South East Dorset conurbation between Wareham and Brockenhurst, consideration was also given to a service increase above the additional 2tph
- 3. Provision of enhanced services between Weymouth and the South East Dorset conurbation either by operating an evenly spaced 2 trains per hour or by increasing frequency to a total of 4tph
- 4. Provision of improved interchange opportunities across Dorset and surrounding counties through the delivery of the enhancements specified in the West of England Line CMSP in combination with the proposed service changes in this study
- 5. Improved First and Last Mile connectivity between rail and other modes to encourage modal shift away from private car use

These outputs would deliver a number of positive outcomes as follows:

- Improved performance on the routes that had been upgraded owing to the targeted removal of single track sections to aid service recovery at times of perturbation
- Enhanced connectivity between Dorset's network of railway lines and potentially with enhanced bus services as part of Enhanced Partnerships thereby transforming the public transport offer in Dorset and surrounding counties, assisting decarbonisation
- Improved connectivity to the South West of England at times when GWR services are unable to use the route via Taunton
- Enhanced transport options for the mobility impaired as a result of station access improvements linked to station masterplans
- Support economic, housing and employment growth as well as increased productivity across the Western Gateway and Peninsula Sub-national Transport Body areas

5.1. Maximising and Integrating Public Transport in Dorset

For each of the five service change aspirations and two broader considerations identified above analysis was carried out and the following conclusions were drawn.

Please be aware that no engineering or estimating work has been carried on these proposed solutions and therefore no costs are supplied.

5.1.1. Provision of an hourly train service on the Heart of Wessex Line between Bristol Temple Meads and Weymouth (Output 1)

Constraint/Problem

The existing Bristol Temple Meads to Weymouth services operate only every two hours, with some intervals being as much as three hours between services, whereas all other corridors in the South West operate at least hourly or in some cases halfhourly service intervals.

This irregular level of service impacts its desirability and attractiveness resulting in lower patronage to that which might be achievable with a more regular service pattern, even when taking account of the rural nature of some station locations. The large amount of single track in place along the line within the scope area of this strategic study constrains the ability of achieving any service change aspirations.

Solution/Intervention Option

An hourly service in each direction on the Heart of Wessex Line could be transformational in terms of attracting suppressed demand. This service change is not achievable on current infrastructure and will therefore require intervention. For a standard hour service (where the train runs in the same slot every hour), the following is likely to be required based on the analysis carried out as part of this study:

- Additional track infrastructure at Westbury and an additional platform (particularly when considered with other service aspirations in the Westbury area)
- Additional track infrastructure, extension of double track or a loop, in the Castle Cary area (to the south of Castle Cary on the Heart of Wessex Line)
- Extension of the loop and associated signalling changes at Maiden Newton
- Redoubling of the tracks approaching Weymouth station

Serving Yeovil Junction station would require:

• Reinstatement of Platform 3

- A new accessible footbridge
- A new chord linking the Heart of Wessex and West of England lines

To offer a 'fast' or limited stop service every other hour would require considerable or complete doubletracking on the Heart of Wessex Line.

Improvements to linespeeds and level crossings should also be considered when developing a scheme to achieve this service change.

Integration of other public transport and active travel modes should be



Figure 42 - Aerial photograph of the Heart of Wessex Line (right) and the area where a new chord would be (left)

considered, particularly in rural locations where access to the railway is limited.

An opportunity to carry out these enhancements would be when re-signalling works are carried out as efficiencies can be made in the design and delivery of the works. Currently, the Dorchester and West of England Line (Basingstoke Panel) signalling areas are planned for renewal in Control Period 8 (CP8 – 2029 to 2034), the Yeovil Pen Mill signalling area is planned for delivery in Control Period 9 (CP9 – 2034 to 2039).

Benefits

This will make the rail services much more attractive to current non-users, encourage modal shift, and offer enhanced diversionary capability via Yeovil Junction when combined with the outputs of the West of England Line CMSP for GWR services which are currently limited to one train every two hours in each direction.

Operation of a regular interval 1tph service on the Heart of Wessex Line will provide improved opportunities for interchange at key locations such as: Weymouth, Yeovil Pen Mill, Castle Cary and Westbury. It will also provide for regular long distance services connecting Weymouth and Bristol as well as providing more direct routes to other areas of the South West without the need to make lengthy detours to Southampton Central and Salisbury.

Benefits analysis (not including any capital or operating costs) carried out as part of this strategic study suggest that a regular interval 1tph service potentially offers good value (Net Present Value – NPV), this value could be improved further by offering a faster service every other hour or operating a 2tph service. However, the

amount of additional infrastructure and associated cost required to enable a faster service is likely to reduce the business case and therefore the 1tph standard hour service is recommended.

Based on the benefits analysis, the addition of a stop at Yeovil Junction to provide interchange opportunities for travel to and from the South West on the West of England Line and to locations to the east (such as North Dorset and Salisbury) is likely to provide the greatest benefits owing to the improvement to regional connectivity. The benefit of this option is further improved if the outputs of the West of England Line CMSP are delivered as this, particularly in the case of proposed service changes to 2tph between Yeovil Junction and Salisbury, would enable better interchange times between the two lines.

5.1.2. Provision of an additional two trains per hour through the South East Dorset conurbation between Wareham and Brockenhurst (Output 2)

Constraint/Problem

The existing local services in the South East Dorset conurbation are less frequent than in other urban areas such as the Cardiff Valley lines, the Cross City line in Birmingham or the Manchester Metrolink branches. In particular, there is a lack of connectivity for more rural locations on the edge of the conurbation to access employment within Bournemouth and Poole both along the railway corridor and from locations north and south of the railway.

Solution/Intervention Option

This service change is not achievable using current rail infrastructure capability and therefore requires intervention. For a standard hour service (where the train runs in the same slot every hour), the following is likely to be required based on the analysis carried out as part of this study:

- A reduction in signalling headways between trains by providing more signals
- The power supply is likely to require upgrade, both in terms of the on-network infrastructure and the off-network supply to the railway. Detailed modelling will be required to understand the power requirements of any service change that is proposed
- The level crossing at Wareham will need to be closed owing to safety and downtime issues that additional service provision will impart. This will allow the Down sidings to be used for moving terminating trains out of the way and for the

potential extension of the Swanage Railway service into Wareham on a regular basis

• The level crossing at Poole will need to be closed owing to safety and downtime

issues that additional service provision will impart. This provides an opportunity to work with BCP Council. developers, and local stakeholders to understand how closure of the level crossing can be incorporated plans for into the development of the town centre and the Transforming Cities Fund proposals



Figure 43 - Level crossing misuse at Poole Level Crossing

- The track layout at Bournemouth will need to be revised and remodelled including a potential new platform(s). This provides the opportunity to address accessibility issues at the station and incorporate other enhancements and development opportunities (e.g. Lansdowne²⁶) at the station
- The track layout at Brockenhurst will need to be revised to improve resilience and performance. It is assumed that the sidings at Brockenhurst could be utilised should shuttle services need to be shunted out of the way at any point

Consideration was also given to increasing the service quantum above 2tph to meet the aspirations of local stakeholders, including BCP Council and Western Gateway Sub-national Transport Body. Analysis suggests that in addition to the above this would require:

- Considerable four-tracking between Wareham and Brockenhurst (some of which may be mitigated by signalling headway reductions)
- The associated rebuilding of stations to accommodate additional tracks
- Rebuild of structures such as over-bridges to accommodate additional tracks
- Potential land acquisition along a constrained corridor

²⁶ https://www.dorsetlep.co.uk/lansdowne-business-district

Benefits

This will enable a much more attractive service for customers from the local stations between Wareham and Brockenhurst and will allow rail to maximise its potential for modal shift. This modal shift could manifest most obviously through the South East Dorset conurbation particularly if linked to First and Last Mile improvements.

Benefits analysis (not including any capital or operating costs) carried out as part of this strategic study suggests that a 2tph increase could provide good value (NPV) and that this value would increase as additional services were added on, thereby increasing service frequency. However, the amount of additional infrastructure (capital funding) and associated revenue cost required to go above an additional 2tph (four-tracking and station re-builds, etc.) is likely to reduce the business case and therefore the plus 2tph service is recommended.

The best benefit cost ratio (BCR) is likely to be provided by extending the Poole terminating service (pre-COVID) to Wareham and operating one additional shuttle service between Wareham and Brockenhurst. Instead of running two new services, by operating one as an extension of an existing service, there is a resultant lower overall operating cost.

The opportunity to make accessibility improvements at Bournemouth, achieve modal shift, bring in potential third party funding through collaboration with stakeholders, and to provide level crossing safety and downtime improvements make the wider benefits of this service change attractive. Increased rail frequency provides the opportunity to improve bus and rail connectivity by reducing the interchange times between the two modes.

5.1.3. Provision of enhanced services between Weymouth and the South East Dorset conurbation (Output 3)

Constraint/Problem

Housing growth around Dorchester, Weymouth and Moreton and access to employment opportunities from South and West Dorset to locations such as the South East Dorset conurbation and the Dorset Innovation Park in Wool may lead to increased car usage and the associated road traffic congestion in the South Dorset area. This could provide an opportunity for rail to maximise its potential, however, the uneven interval between the current 2tph service from Weymouth to London Waterloo makes rail unattractive as the primary mode of choice. There is an aspiration to improve access to employment opportunities from the area between Wareham and Weymouth to locations such as the South East Dorset conurbation and the Dorset Innovation Park in Wool.

Service improvements to make rail more attractive could be achieved through provision of additional services or an evenly spaced 2tph service between Weymouth and the South East Dorset conurbation, and on to London Waterloo. The combination of these single track sections and the availability of timetable slots between Southampton Central and London Waterloo are the main constraints to achieving a more even service interval between Weymouth and Bournemouth.

Solution/Intervention Option

This service change is not achievable using current rail infrastructure capability and therefore requires intervention.

Improved interval between services

For a clockface half hourly two trains per hour service (where the trains run in the same slots every hour), the following is likely to be required based on the analysis carried out as part of this study:

- Redoubling of the tracks approaching Weymouth station
- Re-instating the double track between Dorchester South and Moreton

This would offer the opportunity to provide a more customer friendly service preferably 30 minutes apart.

This service change is not achievable using current rail infrastructure capability and therefore requires intervention.

Increased frequency

The re-doubling of the Moreton Single between Dorchester South and Moreton, as described above, is required for any uplift in frequency from Weymouth on the SWML as it limits the



Figure 44 - Weymouth Station Throat. The closed Weymouth Quay branch is on the right.

71

service pattern to such an extent that another train per hour is not achievable. Any desire to increase the frequency by more than 1tph would be likely to require additional track infrastructure such as loops.

Future re-signalling schemes, within the scope of this study, provide an opportunity to improve signalling headways thereby providing additional capacity.

In addition, a full review of level crossing along the line would be required to understand which ones could see a detrimental impact to safety and/or downtime. The proposed Crossways development near Moreton could result in the need to upgrade or close the level crossing at Moreton station. An increase in service over this level crossing is also likely to mean an intervention is required. As described in 5.1.2, Wareham and Poole Level Crossings are also known to require intervention if train frequency is increased.

The power supply is likely to require upgrade, both in terms of the on-network infrastructure and the off-network supply to the railway. Detailed modelling will be vital to understand the power requirements of any service change that is proposed.

Some of the other infrastructure identified in section 5.1.2, such as Bournemouth layout improvements, will also be required between Wareham and the South East Dorset conurbation depending how any additional service to Weymouth is provided (through the extension of a current service or as an additional service).

Benefits

Providing a more evenly spaced service pattern, through the implementation of the double-track solution between Weymouth and Moreton, could make the service more attractive to potential passengers thereby increasing demand and leading to modal shift. It will also lead to improved performance and service resilience, particularly at times of disruption.

In addition, the re-doubling of the Moreton Single could provide capacity for charter trains or additional services at times of peak demand, for example, on Summer Saturdays or during major sporting events like the sailing at Weymouth during the Olympics in 2012.

Relative deprivation in the Weymouth area could be mitigated against by opening up additional rail journey opportunities to employment locations such as the South East Dorset conurbation and the Dorset Innovation Park in Wool.

The challenge on the west end of the SWML is the relatively lower pre-COVID patronage figures which may make it more important to improve the service interval, as described above, rather than operating additional services.
5.1.4. Provision of improved interchange opportunities across Dorset and surrounding counties (Output 4)

Constraint/Problem

Previously in this document, it has been shown that there is a lack of public transport connectivity not only within Dorset but across the wider region. The key constraints to achieving improved cross-regional connectivity are:

- The irregular service on the Heart of Wessex Line meaning that services between it and the SWML do not always achieve good interchange times at Weymouth or between Dorchester South and Dorchester West for pedestrians
- The irregular service on the Heart of Wessex Line also makes it difficult to interchange at other key locations such as Castle Cary, for services to Taunton, and Westbury for services to Swindon and Reading
- A lack of connection between the Heart of Wessex Line and the West of England Line when travelling from Weymouth thereby preventing an efficient interchange between services on the two lines
- A lack of interchange between the Swanage Railway, a major tourism attraction, and the national railway at Wareham

The Heart of Wessex Line also provides a useful function as a diversionary route for when the line via Taunton is unavailable, but it is only able to accommodate one train in any one direction each hour (therefore one diverted train towards Exeter in one hour and one diverted train from Exeter in the next hour).

Solution/Intervention Option

To improve cross-regional rail connectivity, the following could help to address the lack of journey opportunities:

- Improved connectivity can be achieved between the SWML and the Heart of Wessex Line by providing a regular 1tph service on the Heart of Wessex Line and either improving the interval between the current service level on the SWML or by operating an additional service between Weymouth and the South East Dorset conurbation to reduce the interchange time at Weymouth
- New connectivity between the Swanage Railway and Wareham through the operation of a new service, which is currently proposed through the Restoring Your Railway fund and subject to business case review. This would require

infrastructure changes on the Swanage Railway as well as potential intervention in the Wareham area, such those relating to the level crossing

- Improved connectivity can be achieved between the Heart of Wessex Line and the West of England Line by providing a regular 1tph service on the Heart of Wessex and either:
 - The installation of a south chord at Yeovil Junction to allow the proposed 1tph Heart of Wessex Line service to arrive at a reinstated Platform 3, reverse, and use the north chord to continue to Yeovil Pen Mill (and vice versa) – this would have upfront capital costs but would impact operating costs less than the following option
 - The extension of the Barnstaple to Exeter St. David's through to Axminster, that is proposed in the West of England Line CMSP, to Yeovil Pen Mill to connect with the proposed 1tph regular service on the Heart of Wessex Line

 this is likely to have less capital cost (other than that already suggested for diversionary capability in the West of England Line CMSP) but could have substantial operating cost impacts
- Providing the 1tph regular service on the Heart of Wessex Line could provide better interchange times and opportunities with other services and other lines at Castle Cary and Westbury through the introduction of additional infrastructure (track and/or platforms). An improved walking route and wayfinding between the two Dorchester stations should be considered for improved interchange between the SWML and Heart of Wessex Line. Ensuring improved interchange times ought to be looked at in more detail should any scheme be taken forward to improve the service on the Heart of Wessex Line as this will require more detailed analysis across a wider area
- At all interchange locations accessibility will need to be considered both on the station and for onward travel using other modes. On-station accessibility is particularly an issue at locations such as Dorchester South, Dorchester West, Yeovil Junction, Yeovil Pen Mill, and Castle Cary where full accessibility is not provided

The West of England Line CMSP (LINK) sets out the requirement for the infrastructure to enable a 1tph in each direction diverted service via Castle Cary and Yeovil Junction to Exeter St. David's. The additional track infrastructure around Castle Cary, suggested in this strategic study, to enable a 1tph Weymouth to Bristol Temple Meads service will be required in a scenario where both the diverted and the timetabled service are operated. As the West of England Line CMSP and the Dorset

Connectivity recommendations are progressed the two schemes need to be aligned to ensure the best option for diversionary capability is chosen.

Benefits

As has been shown within this study, improvements to regional connectivity can have positive benefits for:

- Modal shift away from the private car and the associated decarbonisation benefits that can be achieved. Modal shift on the currently unelectrified Heart of Wessex Line would still have some decarbonisation benefit in terms of reducing the number of cars on the road despite the use of diesel multiple units (DMUs). Network Rail's Traction Decarbonisation Network Strategy (TDNS - <u>LINK</u>) suggested that potential future battery operation could be a solution on the Heart of Wessex Line between Weymouth and Castle Cary and then if the railway beyond Castle Cary to Bristol Temple Meads is all electrified then electric traction could be utilised
- Levelling up and economic productivity benefits could be realised through improvements to regional connectivity by connecting relatively deprived areas around Weymouth and the South East Dorset conurbation to other areas for employment or vice versa
- Improvements to regional connectivity can help in the reduction of road congestion and the associated drop in pollution levels and rise in wellbeing that could also be achieved. The benefits of this can only be fully realised if First and Last Mile opportunities (see Output 5, below) are taken advantage of so that getting to and from the railways for onwards travel by rail is made easier and is comparative to road travel
- Improvements to connectivity at Wareham could support the tourism industry by providing seamless integration between the national railway and the Swanage Railway, as well as the associated benefits to road congestion in the Purbeck area

In terms of improvements to diversionary capability, the productivity of the wider South West region will be supported by allowing the railway to continue to operate a service and therefore keep passengers and freight moving at times of perturbation and disruption.

5.1.5. Improved First and Last Mile connectivity (Output 5)

Constraint/Problem

In this study several locations were identified where an infrequent bus service providing poor interchange with infrequent rail services. This results in an unwillingness to use sustainable transport modes when making journey choices.

Owing to the railways in Dorset being positioned around the edges of the wider county area there is a reliance on the private car or in some cases an infrequent bus service to access the railway. Areas to the north of the South East Dorset conurbation and rural villages along the Heart of Wessex may require improved bus services that connect to the railway at key locations.

In some locations the provision and integration of active travel modes could be improved to encourage people out of their private cars, particularly in more urban areas and for onward leisure journeys.

Solution/Intervention Option

Network Rail and the rail industry colleagues have been involved in discussions with local authorities about the development of their Bus Service Improvement Plans (BSIP) as required by the 'Bus Back Better' National Bus Strategy published in March 2021 by the Government. The Government is keen to see improved integration between bus and rail services in these plans.

Providing enhanced inter-urban bus services operating at least on an hourly frequency, integrating with Dorset rail services that have been improved as outlined in 5.1.1 to 5.1.3, above, will allow public transport as a whole to improve its offer across Dorset and surrounding counties thereby delivering modal shift and achieving climate change and other targets that are shared by stakeholders.



Figure 45 - 'Bus Back Better' (2021), Department for Transport

Collaborative working with BCP and Dorset Councils to ensure other public transport and active travel modes are integrated at railway stations is essential when making the business case for rail connectivity service improvements. Programmes such as the Transforming Cities Fund (TCF) awarded to BCP and Dorset Councils to improve six sustainable transport corridors are an ideal opportunity for the railway industry to work with its partners to achieve sustainable end to end journey options.

The recommendation of this strategic study is for Network Rail to work collaboratively with bus and rail operators, local authorities, and other interested parties such as Community Rail Partnerships, TravelWatch South West and the Swanage Railway on a series of station masterplan exercises that link into the rail service aspirations of this study.

In partnership, a master plan will be developed for specific station locations that seeks to make those stations into mobility hubs by identifying:

- Available land for development (development of stations, combining available railway land with local authority land, etc.)
- Enhancements to the operational railway (re-signalling schemes, level crossings, other renewals and enhancement plans, etc.)
- Public transport and active travel integration and service frequency opportunities (enhanced bus stop facilities, walking and cycling routes and facilities, etc.)
- Environmental and sustainability improvements (E-bikes, bio-diversity areas, community use of railway buildings, solar energy etc.)

Several proposed locations have been identified based on the service changes suggested in this strategic study, these include:

77

- Brockenhurst
- Bournemouth
- Christchurch
- Dorchester South and Dorchester West
- Moreton
- Poole
- Wareham
- Weymouth
- Wool
- Yeovil Junction and Yeovil Pen Mill

An illustrative proposal specification for these master plans can be found in Section 8 of this document, the Appendices, with Wareham as an example. This is a work in progress and has not been finalised or agreed with partners at this time.

Benefits

This combination of measures including frequency enhancements and improved interchange facilities at mobility hubs will make public transport much more attractive and a viable alternative to private car use, thereby delivering environmental, congestion and productivity benefits across the wider Dorset area.

6. Emerging Strategic Advice

Section 5.1 has identified the interventions required to deliver against five outputs, these outputs are:

- 1. Provision of an hourly train service on the Heart of Wessex Line between Bristol Temple Meads and Weymouth, variations on this service level were considered:
 - a. Direct via the existing route
 - b. Via Yeovil Junction using a new south chord between the Heart of Wessex Line and the West of England Line
 - c. A "fast" service every other hour with a limited stopping pattern
- 2. Provision of an additional two trains per hour through the South East Dorset conurbation between Wareham and Brockenhurst:
 - a. +2tph
 - b. +3tph 4tph
- 3. Provision of enhanced services between Weymouth and the South East Dorset conurbation:
 - a. Evenly spaced 2tph
 - b. Increasing frequency
- 4. Provision of improved interchange opportunities across Dorset and surrounding counties through the delivery of the enhancements specified in the West of England Line CMSP in combination with the proposed service changes in this study
- 5. Improved First and Last Mile connectivity between rail and other modes to encourage modal shift away from private car use

The interventions required for Outputs 1-3 are summarised in the table below:

	Outputs						
Interventions to deliver Outputs	1			2		3	
	α	b	с	a	b	a	b
Weymouth throat re-doubling	✓	✓	~			~	✓
Moreton Single re-doubling						~	✓
Power supply upgrade				✓	~		✓
Level Crossing review and associated upgrades or closures	~	~	•	•	✓		v
Signalling headway reduction				✓	~		✓
Wareham Level Crossing closure				~	~		~
Poole Level Crossing closure				~	~		~
Bournemouth re-modelling				~	~		~
Brockenhurst re-modelling				~	~		~
Extensive four-tracking of SWML					~		
Extension of Maiden Newton loop	~	~	~				
Yeovil south chord		~					
Linespeed improvements	~	~	~				
Extension of double track south of Castle Cary	~	~	~				
Additional track/platform in Westbury area	~	~	~				
Extensive or complete re-double tracking of the Heart of Wessex Line			~				

Table 15 - Summary of interventions to deliver outputs from the Dorset Connectivity Study

Where appropriate, projects based on these interventions should look for synergies with identified future renewals to minimise disruption and improve value for money. An opportunity to carry out these interventions would be when re-signalling works are carried out as efficiencies can be made in the design and delivery of the works. Currently, the Dorchester and West of England Line (Basingstoke Panel) signalling areas are planned for renewal in Control Period 8 (CP8 – 2029 to 2034), and the

Yeovil Pen Mill signalling area is planned for delivery in Control Period 9 (CP9 – 2034 to 2039).

Outputs 4 and 5 are over-arching to the three core outputs above. Improved service levels provide the opportunity to improve transport mode integration, accessibility and other operational and passenger experience concerns as detailed in the previous chapter.

6.1. Recommendations

The recommendations presented are for potential funders to consider for development and ultimately delivery. The recommendations from this study have been produced collaboratively with industry and wider, local stakeholders to deliver a collective view on what is required to deliver future train service changes that support socio-economic benefits for the wider Dorset area. Based on the findings of this strategic study the following recommendations can be made:

1. Closure of the level crossing at Poole should be progressed collaboratively between Network Rail, the Western Gateway Sub-national Transport Body and Bournemouth, Christchurch and Poole Council, depending on the availability of funding. The Transforming Cities Fund improvements and plans for the development of Poole town centre may provide an opportunity for progressing the closure of the level crossing. Regardless of any future train service changes this recommendation should be progressed as it provides safety benefits and mitigates against community severance



Figure 46 - Poole Level Crossing

2. Closure of the level crossing at Wareham should be progressed collaboratively between Network Rail, the Western Gateway Sub-national Transport Body and Dorset Council, depending on the availability of funding. Regardless of any future train service changes this recommendation should be progressed as it provides safety benefits, access to the Down sidings and mitigates against community severance



Figure 47 - Wareham Level Crossing

- 3. At the appropriate time, as directed by DfT, a Decision to Initiate, or a series of Decisions to Initiate for individual elements, should be raised by Network Rail within the Rail Network Enhancements Pipeline process. These Decisions to Initiate (see section 7.0) will instigate a Strategic Outline Business Case (SOBC) that either presents the five outputs identified in this study and the associated interventions required to deliver them or presents individual elements to make specific service changes. A decision will then be made over which service change outputs should be progressed further for potential delivery; work carried out in this strategic study suggests the following:
 - a. A 1tph service on the Heart of Wessex Line with an additional call at Yeovil Junction via a new south chord
 - b. A +2tph service between Wareham and Brockenhurst
 - c. An improved half hourly interval between services operating from Weymouth to London Waterloo
- 4. The recommendations of the West of England Line CMSP should be progressed with the intention of integrating them with the recommendations of this strategic study to enable improved cross-regional connectivity
- 5. Masterplan exercises should be undertaken on the following station locations:
 - a. Brockenhurst

- b. Bournemouth
- c. Christchurch
- d. Dorchester South and Dorchester West
- e. Moreton
- f. Poole
- g. Wareham
- h. Weymouth
- i. Wool
- j. Yeovil Junction and Yeovil Pen Mill

These masterplans will provide an opportunity for all interested parties to work collaboratively in ensuring that there is full integration of public and active transport modes at these locations to improve the sustainable First and Last Mile journey options available to rail passengers. They will also consider:

- Accessibility at the station
- Environmental issues and opportunities
- Community involvement and usage of the station
- Mobility hub options
- Station development opportunities
- Station facility improvements
- Connectivity to tourist and leisure destinations, such as the Swanage Railway
- Third party funding opportunities
- Railway operations, renewals, and enhancement synergies

Network Rail is open for business and welcomes the chance to work with funders and interested parties to progress these recommendations. Network Rail will continue to work with funders to refine credible options that meet the needs of passengers; that drive social and economic benefits; and that fit with the long-term needs of a safe and reliable railway system.

7. Next Steps...

This strategic study has identified several potential service changes to deliver improved connectivity in the wider Dorset area. The outputs and Recommendations identified in sections 5.0 and 6.0 are presented for potential funders to consider for development and ultimately for delivery.

It has already been stated that the closure of Wareham and Poole level crossings are key to any service change on the SWML in this area, and therefore solutions to their closure should be progressed in collaboration with local stakeholders.

It is likely that central Government funding would be required for any service changes requiring additional rail infrastructure and therefore the development of any future schemes should align to the Rail Network Enhancements Pipeline (RNEP) process. The RNEP process creates a rolling programme of enhancements on the railway to improve services for passengers and customers. The decision points for investment in the railway are supported by the Government's Five Case Model for business cases, ensuring value for money throughout the lifecycle.





The first stage of the process, a Decision to Initiate, is the establishment of the case for intervention from this strategic study and an agreement to produce a Strategic Outline Business Case (SOBC). This would form the next stage in progressing recommendations, entering the potential interventions into the pipeline.

In addition, potential local funders such as Local Authorities and the Western Gateway Sub-national Transport Body should work with Network Rail and other rail industry partners to identify opportunities for third part investment.

When progressing any of the solutions or interventions for the outputs identified in this study, consideration should be given to other local stakeholder and rail industry aspirations and how they may impact the development and delivery of the recommendations. Their inclusion in this document does not necessarily indicate Network Rail support for the specific aspiration. These aspirations include:

• New stations, including:

- $\circ~$ A park and rail station at Monkton for access to Dorchester
- o A new rural station at Grimstone & Frampton
- A new station at Sparkford
- A new station at Talbot Heath for Bournemouth University
- New railway lines (light rail or heavy rail) and service opportunities, including:
 - Consideration of alternative service patterns or phased implementation of services
 - Bridport to Maiden Newton
 - A Swanage Railway to Wareham service (currently developing a business case)
 - A connection to Bournemouth Airport and Ferndown
 - o A connection to Ringwood
 - Somerset & Dorset Line
- Freight opportunities
 - Re-opening of the Hamworthy Line to Poole Harbour
 - Express parcel traffic (considered for national rail network)
- New and innovative technologies
 - Autonomous vehicles for onwards connectivity
 - Traction decarbonisation of rail services
 - o Sustainability opportunities
 - Personalised journey planning technology

A table showing alignment between the outputs identified in this strategic study and Sub-national Transport Body policy is included in the appendices of this document, see section 8.

8. Appendices

8.1. Safety Baseline

To understand the general safety profile of the study area, a safety baseline has been carried out and looks to identify particular areas of concerns, such as a concentration of incidents at one location. Data is retrieved from SMIS and TRUST for the year 2019/20 and categorised for comparison between locations within the study area, as well as across the whole of Wessex. The recorded data and supplementary commentary can be found in the below table.

1. Slips, trips and falls
Source: SMIS
There were 7 slips, trips and fall incidents in the study area in 2019/20. This formed 4% of all slips trips and falls on the Wessex Route.
Slips, trips and falls were minimal in the study area and were spread across several locations, with no notable hotspot.
2. Suicide/Attempted suicide
Source: TRUST
There were 16 suicide incidents reported in the study area during 2019/20. This formed 26% of suicide incidents on the Wessex route.
The number of suicide incidents at Bournemouth accounted for more than half of those recorded in the study area, with the remaining distributed across 6 other locations.
3. Near misses
Source: SMIS
There were 12 near misses reported in the study area in 2019/20. This formed 15% of near misses on the Wessex Route.
Near misses were spread over several locations with no notable hotspot.
4. Staff accidents
Source: SMIS
There were 16 staff accidents reported in the study area in 2019/20. This formed 8% of near misses on the Wessex Route.

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Staff accidents were spread over several locations with no notable hotspot.

5. Trespass /Vandalism

Source: TRUST

There were 197 incidents of trespass and vandalism reported in the study area during 2019/20. This formed 17% of trespass/vandalism incidents on the Wessex Route.

Southampton Central experienced 11% of the trespass and vandalism incidents within the study area in 2019/20. Almost every location within the study area had recorded a trespass or vandalism incident.

6. Weather

Source: TRUST

There were 37 weather related incidents in the study area in 2019/20. This formed 17% of all weather-related incidents on the Wessex Route.

Yeovil Pen Mill accounted for 19% of weather-related incidents in the study area, with Bournemouth accounting for another 16%. The remaining incidents were spread over a number of other locations.

7. Level crossing interface

Source: SMIS

There were 29 level crossing interface incidents in the study area in 2019/20. This formed 12% of all level crossing incidents the Wessex Route.

The majority of level crossing incidents were recorded at Poole (High Street) and Wool, with 17 and 9 incidents respectively.

8. Fly tipping cases

Source SMIS

There were 0 fly-tipping incidents in the study area in 2019/20. This formed 0% of fly-tipping incidents the Wessex Route.

9. Staff assault

Source: SMIS

There were 2 staff assaults in the study area in 2019/20. This formed 10% of all assaults on the Wessex Route.

10. Bridge Strike

Source: TRUST

There were 6 Bridge strikes in the study area in 2019/20. This formed 5% of all bridge strikes on the Wessex Route.

There was no hotspot for bridge strikes during 2019/20.

8.2. Illustrative draft specification for Wareham station master planning exercise

8.2.1. Wareham Masterplan Specification

Purpose

The purpose of this document is to set out the areas of study that a masterplan exercise for Wareham station should consider. This document will also identify the stakeholders and partners who should be engaged with to take this masterplan exercise forward and will identify any interfacing schemes or aspirations that should be included.

Background

This masterplan exercise was identified as a recommendation in the Dorset Connectivity Strategic Study. Wareham was identified as a candidate for further focus owing to the Indicative Trains Service Specification (ITSS) for the Dorset Connectivity Strategic Study specifying several service changes that would increase frequency between rural Dorset, the Bournemouth, Christchurch and Poole (BCP) conurbation and Hampshire/New Forest.

The ITSS suggested the addition of new shuttle services between Wareham and Brockenhurst as well as extensions to current services to Wareham (the current Poole terminating service). This intensification of service at Wareham has been identified as a means of encouraging modal shift away from the private car for journeys across the BCP conurbation and could therefore make Wareham a railhead for the wider rural Dorset area.

The Dorset Connectivity Strategic Study has recognised the importance of the First and Last Mile concept and the need to provide opportunities for passengers to make their whole journey sustainably. Connectivity with other transport modes at Wareham, to connect with an enhanced rail service, is therefore essential in achieving this aspiration.

Wareham is the railway gateway to the Isle of Purbeck and therefore is an important focus of leisure travel to the area. The 'Restoring Your Railway' (RYR) scheme to connect the Swanage Railway to Wareham will, if taken forward, enhance onwards rail connectivity for leisure travellers to/from the Isle of Purbeck; and for those wishing to make other journeys to the BCP conurbation and beyond.

These potential future service enhancements (the strategic study ITSS and RYR scheme), offer an opportunity for all concerned parties to work together in

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partnership to develop a masterplan or strategy for how to encourage people to use the railway to/from Wareham in line with these service change aspirations.

Other considerations at Wareham

As well as the proposed service changes identified through the Dorset Connectivity Strategic Study and the Swanage Railway RYR proposals, there are several other considerations that make Wareham a candidate for this masterplan exercise. These are:

Wareham Level Crossing

This level crossing was due to be closed as part of the Poole to Wool Re-signalling scheme. Unfortunately, this was not achieved and there are now operational restrictions that prevent full use of the rail infrastructure in the area (such as the Down Sidings).

A Level Crossing guard is in place to ensure the safety of users and is paid for by Dorset Council.

Additional services and/or increases in usage may accelerate the need for closure.

Accessibility

Wareham station is not fully accessible and is a 'Step-Free Category B' station as a consequence. There is no platform to platform accessible interchange except via the level crossing, although there is level access to each individual platform. A footbridge (without lifts or ramps) connects the two platforms.

Previous attempts to close the level crossing and provide step free platform to platform access at the station have failed to find a solution that is acceptable to all parties and stakeholders.

Station facilities

The station has no retail facilities in terms of a shop or café available to passengers and the station is some way from the town; this can make the station seem somewhat isolated.

The Wareham Cycleworks shop is situated within the station building and provides bicycle advice, sales, and repairs.

Car parking

There are 69 car parking spaces with two accessible spaces available for those with mobility issues. There are opportunities to understand how this could be improved

in line with proposed service changes and making Wareham more of a hub for onwards rail travel to Swanage or the BCP conurbation.

Land/Property

There is the potential for land around the station to be considered for community use and to make the station more of a destination. Previous suggestions have included community use of the old signal box.



Figure 49 – Railway estate around Wareham Station

Development of Network Rail land for housing or railway operational purposes should also be considered.

Integration with other modes

The nearest bus stop is close to the station on Sandford Road roundabout. It is serviced by the number 40 bus on a daily basis (one bus per hour) and the X54 to Weymouth which is daily during the summer (one bus every two hours) and Monday to Friday in the winter. PlusBus is available for onward journeys from Wareham station.

A cycleway runs past the railway station via the level crossing. Bicycles can be purchased and repaired at the station at the Wareham Cycleworks shop.

The potential for the introduction of 'Beryl Bikes' or similar bike share services.

Taxis are available from the station forecourt.

How integration with these other modes can be improved should be considered through this masterplan exercise as well as how future development might impact or provide funding opportunities for the integration of transport modes, see below.

Station Travel Plans

SWR are currently updating their station travel plans which provides an opportunity for a tie in with this masterplan exercise.

Development

Consideration should be given to what development, housing, leisure, and employment, is planned in Wareham and the wider Dorset area that might result in the potential for increased rail travel to/from Wareham. How future development can provide improved integration with other modes and provide funding opportunities should also be considered.

Sustainability

Consideration should be given to what sustainability and environmental improvements could be achieved at Wareham, for instance: improving the energy rating of the station building, electric vehicle charging points, improving the biodiversity status of the station area.

Key stakeholders and partners:

This masterplan exercise should be taken forward as a joint piece of work with Network Rail's stakeholders and partners as the railway is only part of the solution to improved connectivity in Dorset. Therefore, it is suggested the following organisations should be included in this partnership:

- Network Rail
- South Western Railway (SWR)
- Dorset Council
- Western Gateway Sub-national Transport Body
- Morebus (bus operator part of the GoAhead Group)
- First Wessex, Dorset & South Somerset (bus operator part of First Group)
- Purbeck Community Rail Partnership
- Swanage Railway

8.3. Output Alignment with Sub-national Transport Bodies

Output	Stakeholder Alianment		
Output 1			
Provision of an hourly train service from on the Heart of Wessex line from Bristol Temple Meads to Weymouth via Yeovil Junction.	The Western Gateway Rail Strategy aspires to an hourly frequency on this route. ²⁷		
Output 2			
Provision of an additional 2 trains per hour through the South East Dorset conurbation between Wareham and Brockenhurst.	The Western Gateway Rail Strategy aspires to between 4 and 6tph on this route. This proposal would give enhanced services on this corridor.		
Output 3			
Provision of enhanced services between Weymouth and the South East Dorset conurbation	This is in line with the Western Gateway Rail Strategy's desire for improved interchange between services at Weymouth and the aspiration to improve the frequency of services between urban centres.		
Output 4			
Provision of improved interchange opportunities across Dorset and surrounding counties	The Western Gateway Rail Strategy aims for 2tph at stations on the West of England line which aligns with the service changes identified in the West of England CMSP as well as the interchange opportunities identified in this study. Work on rail is led by the <u>Peninsula Rail Taskforce</u> on behalf of Peninsula Transport. They have identified		
	three key priorities that broadly aligh to the aspiration of this study:		
	 A resilient and reliable railway: protecting the coastal mainline is a PRTF top priority. The South West rail network needs a resilient line, with trains that are capable of operating all year round Reducing journey times and better connectivity: particularly between key UK markets, including London, the Midlands and the North. The PRTF has stated that there needs to be infrastructure and signalling improvements Increasing capacity and comfort: they state that there needs to be an increase in the frequency of trains and the number of seats must meet forecast passenger growth 		

²⁷ <u>https://www.westerngatewaystb.org.uk/strategy/rail-strategy</u>

Output	Stakeholder Alignment
	There also state a need for a commitment to complete development work for a package of infrastructure enhancements to deliver greater track capacity between Castle Cary and Exeter, along the Exeter to Waterloo line via Honiton and Yeovil. This will both facilitate trains being diverted in the event of line blockades on the main line via Taunton, but also enable frequency increases serving Honiton and Cranbrook. ²⁸
Output 5 Improved First and Last Mile connectivity	The Western Gateway Rail Strategy is keen to see improved accessibility at stations and Mobility Hubs which form part of this option. The Dorset LEP SEDUMS report highlighted poor facilities in terms of cycling and accessibility at stations. ²⁹

²⁸ <u>www.peninsulatransport.org.uk/rail-schemes/</u>
 ²⁹ <u>Richard Adams Report South East Dorset Urban Mobility Strategy 2020-02-25 (dorsetlep.co.uk)</u>

94



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