The Marches Corridor Strategic Study

"How can the Welsh Marches line and the Shrewsbury – Chester line accommodate stakeholder aspirations that best support sustainable economic and social growth in Wales and borders?"

August 2024

Authored by Bethan Swidenbank

Wales and Borders

Wales and Borders

Table of Contents

Wales and Borders

Executive Summary

Study Context

This study seeks to understand future aspirations for improvements to passenger and freight journeys along the Marches and Shrewsbury-Chester railway lines which weave across the Anglo-Welsh border providing critical north to south Wales connectivity for key markets including commuter, leisure, education, and business.

The headline question this study sought to answer, and the sub-questions below are explored in more detail in this study:

How can the Welsh Marches line and the Shrewsbury – Chester line accommodate stakeholder aspirations that best support sustainable economic and social growth in Wales and Borders?
Strategic Question 1: How can the Marches line best support its key markets, taking cognisance of post-covid behaviour and demand growth in the study area? ***Objective: To understand the varying markets along the corridor and the way in which the railway is used.***
Strategic Question 2: How can we make best use of the Marches infrastructure? How can infrastructure changes support future aspirations for the line? ***Objective: To recommend infrastructure and/or service changes that will improve the passenger experience along the corridor and will meet both short- and long-term strategic objectives.***
Strategic Question 3: What is the role of rail in the Marches corridor in supporting the roadmap to net zero? ***Objective: To understand the road to decarbonisation on the Marches route, in line with UK Government's 0% carbon emissions target of 2050 and Welsh Government's Wellbeing of Future Generations Act.***
Strategic Question 4: How can stations on the Marches be made fit for the future? ***Objective: Establish how to make stations along the corridor fit for the future.***

Methodology

Extensive stakeholder engagement has taken place throughout development of this study, both within the railway and transport industry, but also regionally, to better understand aspirations and growth in the local areas and how the railway can support. We are extremely grateful to all stakeholders who have taken the time to feed into this study.

In order to provide the evidence and analysis to produce this study, the following process was followed:

- Stakeholder forums and 1-1 stakeholder sessions took place throughout the study programme to understand the current baseline, existing issues and future aspirations. Stakeholders were

Wales and Borders

also able to feed into the initial study remit and support the ongoing development of Indicative Train Service Specifications (ITSS).

- Network Rail Economic Analysis produced contextual evidence analysis considering market usage by volume and revenue, the connectivity and capacity analysis and modal share assessment. The economic analysis team also produced analysis of each of the ITSS options.
- Station site visits took place at most stations along the corridor to better understand their condition, facilities and usage, supported by Network Rail Station Capacity Planning.
- Five ITSS options were developed – providing a proposed phasing of improvements to passenger and freight services across the corridor.
- Network Rail Advanced Timetable Team produced capacity analysis of each of the ITSS options – helping to understand what the existing infrastructure is capable of, and what interventions may be required to deliver improvements in services. These interventions are summarised in the table below and explored in more detail later in the study:

	Signalling interventions between Shrewsbury and Wrexham	Signalling interventions between Newport and Hereford	Shrewsbury Platform 3 reconfiguration	Signalling interventions between Hereford and Shrewsbury	Redoubling between Wrexham General and Rosset Junction	Non-infrastructure consequence
Existing Dec 2023 freight services – ITSS 2						
Cardiff/Shrewsbury – Liverpool (1tph – Cardiff 0.5tph) – ITSS 2	✓					
Birmingham – Shrewsbury (2tph total) – ITSS 2						
Cardiff – Manchester fast service (1tph) with Cardiff – Shrewsbury stopper service (1tph)* - ITSS 3		✓				✓ *Slower journey times in heavy load freight traffic hours*
Hourly freight path in each direction – ITSS 4		✓		✓		✓ *Slower journey times for CAR-MAN services in some hours*
Existing Crewe – Chester extended to/from Wrexham General (1tph) – ITSS 4						✓ *Retiming of departure from Crewe 4 mins additional journey time for some trains*
Birmingham – Hereford (additional 1tph) – ITSS 4						
0.5 tph Shrewsbury – Crewe stopper (1tph total) – ITSS 4			✓			
Euston – Shrewsbury (1tph) – ITSS 5			✓			
Crewe – Chester – Wrexham (as extended in ITSS 4) extended to Shrewsbury (1tph) – ITSS 5			✓			
Leeds – Manchester – Chester extended to/from Wrexham (1tph) – ITSS 5					✓ **	✓ *Would require retiming*

Wales and Borders

Our recommendations and next steps

Bringing together all of the above evidence and analysis, the study then developed a series of choices for funders and recommendations for further development, aligning to each of the Strategic Questions the study sought to answer. These are summarised in the tables below and explored further in the study:

Strategic Question 1: How can the Marches line best support its key markets, taking cognisance of post-covid behaviour and demand growth in the study area? **Strategic Question 2:** How can we make best use of the existing Marches infrastructure? How can infrastructure changes support future service aspirations?
Service options to be further developed with stakeholders and to inform future strategic planning work: • Improved connectivity to Liverpool • Segregation of short and long-distance markets to support journey time aspirations and better frequency for smaller stations. • Improved connectivity to Wrexham • Further improvements to cross-border flows. • Additional service between Abergavenny and Cardiff.
Infrastructure options to be further developed through feasibility work and to inform ongoing development work: • Signalling intervention in Gobowen area to facilitate Cardiff to Liverpool services. • Signalling intervention between Newport and Hereford to improve journey time opportunities and performance. • Shrewsbury Platform 3 reconfiguration to facilitate additional services and improve performance. • Signalling interventions between Hereford and Shrewsbury to facilitate additional freight paths. • Level crossing interventions to facilitate increased services
Interventions that would complement the above service and infrastructure options, and further development and feasibility would need to consider: • Capacity improvements and Chester and Crewe • Investigation of re-timing requirements created by the service enhancements. • Better understanding and improvements to interchanges at Shrewsbury. • Consideration of bi-directional working options to improve flexibility. • A turnback facility at Abergavenny. • Further development of existing workstreams to respond to long term strategic goals.
Strategic Question 3: What is the role of rail in the Marches corridor in supporting the roadmap to net zero?
First and last mile opportunities to be reviewed and prioritised alongside stakeholders for further development to encourage greater modal shift including: • Park and Ride options for passengers outside standard station catchment areas to reduce travel by private vehicle. • Support station masterplans at Hereford, Shrewsbury, Newport and Wrexham that provide better bus links and cycle options. • Minor station improvements to promote active travel.
Decarbonisation options to be developed in future decarbonisation and fleet strategy work: • Better understanding and development of intermediary options for electrification to meet net zero targets, with a view to achieving full electrification in the future. • All future passenger and freight rolling stock programmes should reflect national decarbonisation proposals.
Strategic Question 4: How can stations on the Marches be made fit for the future?
Options to be considered in future station development, alongside key stakeholders: • Minor station improvements at all stations. • Any new station proposals should take cognisance of the train service specifications proposed, as well as key facility requirements at stations.

Wales and Borders

Introduction

Context

The Welsh Marches line, along with the Shrewsbury - Chester line, traverses north from Maindee Junction near Newport, along the Wales-England border and provides a direct rail connection between the north and south of Wales, as well as serving key destinations including Hereford, Shrewsbury, Wrexham, Chester, and Crewe.

The line has key strategic and political importance in being the only railway line which provides direct connectivity for passengers and freight between North and South Wales, albeit running through parts of England. As a direct result of its geography and unique service provision, there are a plethora of aspirations from an extensive range of Welsh and English stakeholders and collaboration has been integral to ensure all viewpoints are considered.

There are also limitations afforded by the infrastructure including an ageing signalling system, some challenging gradients, and numerous level crossings, which have prompted several asset-based projects that will likely interface with this study. It is largely double track apart from a single line section between Wrexham and Saltney junction (WSJ2 202miles 40chains – 206miles 44chains).

The Marches line suffers from a conflicting geographical location where it is primarily located within English geography but falls under Welsh infrastructure management as part of Network Rail Wales and Borders Route and is served primarily by the Wales and Borders franchise operator – Transport for Wales Rail. As such, it is often the subject of missed opportunities or consideration from funders. Despite its relevance in connecting North and South Wales & North West England and its role in connecting rural Mid Wales to key hubs across the border, the corridor has not seen any significant infrastructure investment since the investment of £60m for redoubling and linespeed improvements as part of the North South Wales Journey Time Improvement project in March 2017, nor has there been any real investment opportunities since for funders.

Network Rail Wales and Borders strategic team have recognised the lack of infrastructure investment and ongoing issues along the corridor, which this study seeks to respond to.

Geographical Scope

The scope of this study begins at Newport (South Wales) station (SWM2 158m 2ch) and concludes at two locations north of Shrewsbury at Crewe (CNH2 197m 11ch) and Chester (WSJ2 171m 50ch), recognising that some key markets may be outside this geographic scope serving external hubs such as Cardiff, Manchester and Birmingham. This is visualised in Figure 1 below.

Wales and Borders

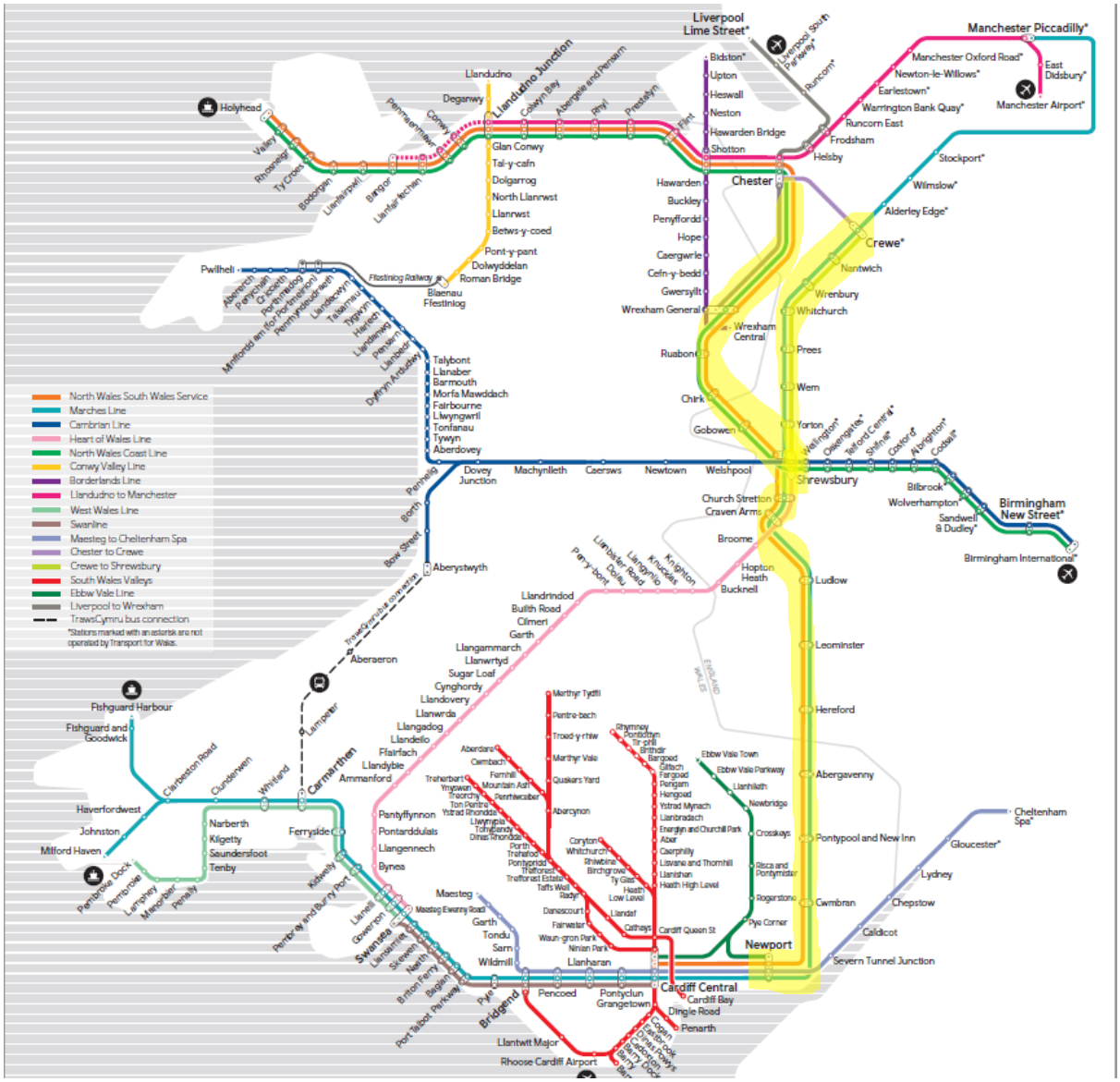


Figure 1 – Map highlighting the Marches corridor and the Shrewsbury – Chester line

Case for change

Despite its key role in providing connectivity between North and South Wales, connecting cross-border communities, and facilitating leisure and commuter travel into key hubs from Newport to Chester, the Marches line remains a corridor lacking in the funding and interest it needs to realise its potential.

The line seeks to respond to a multitude of markets, with passenger services required to provide local, regional, and long-distance services that are not fully optimised to any individual market requirement compared to routes elsewhere that provide separate stopper and fast services. The line was operated until recently by Class 175, 2- and 3-car units which since 2023 have been replaced by Class 197 and Mark IV sets as part of TfW's fleet renewal. The historical use of this ageing rolling stock comprising of primarily two-car units has often resulted in overcrowding at peak times and an

Wales and Borders

inability to respond to the demand along the route. The new 197 fleet will permit journey time benefits due to better performance, and this will see improved journey times from December 2024. There are however also longer-term aspirations to operate some faster services along the corridor. Performance is poor along the corridor [often the poorest performing route across Wales and Borders with the latest data (as of period three ending 22nd June 2024) showing under 60% of trains arriving within 59 seconds of planned time] and is struggling to recover as the fleet introduction delays persist and lack of funding to enable infrastructure improvements continues.

Modal share figures reflect the comparative low passenger usage along the corridor, with the share percentage at most stations on the corridor (1% and 2%) falling below the UK national average of 3%. The infrastructure runs in parallel to the A49 road for much of its geography and a basic road vs rail comparison is often detrimental to the railway (particularly at non-peak times) with journey times and passenger experience often superior by road.

Capacity along the corridor is restricted, therefore increasing or improving passenger services may impact on opportunities for increased freight services including the ad-hoc freight path opportunities that are frequently utilised on this corridor. This is partly due to an ageing signalling system which features several lengthy single-line block sections, as well as a lack of useable loops along the corridor for passing opportunities which would subsequently boost the line's capacity.

If the Marches line is to fulfil its potential, it needs to respond to the issues outlined in this section. This study will seek to provide recommendations to help the line meet the needs of its passengers and freight users.

Strategic Alignment

The study purpose aligns with key strategic priorities nationally, regionally, and locally by identifying areas for improvement on the line that will cater to the appetite for better connectivity, improved journey times and greater flexibility on the Marches line network. The study invariably responds to multiple governmental visions for general improvements in infrastructure, which are set out below, however it does respond in equal measure to encouraging modal shift and building better travel opportunities for struggling rural communities and passengers in areas of social deprivation along the corridor.

The route has also been recognised as an important enabler to improving cross border connectivity in the Union Connectivity Review, which may present a future funding avenue to develop interventions identified in this study.

Union Connectivity Review (UK Government) [1]

- *Develop a package of railway improvements to increase connectivity and reduce journey times between Cardiff, Birmingham and beyond, which could include better rolling stock, timetable changes and enhanced infrastructure:* The study will respond to stakeholder aspirations that seek to improve long-distance journey times as well as provide direct connectivity to new geographic locations. A series of choices for funders will be proposed in order to meet these aspirations that are likely to include both timetable changes and enhanced infrastructure.

[1] Union connectivity review: final report - GOV.UK (www.gov.uk)

Wales and Borders

- *Plan improvements to the network using multimodal corridors, which should be reviewed regularly and appraised on a wider economic basis in order to support government objectives such as levelling up and net zero:* As part of this study's indicative train service specifications, (ITSS), the choices for funders will set out improvements that will promote additional flexibility and therefore additional opportunities for passengers to use the railway with additional services and better connectivity; resulting in opportunity to increase railway modal share and support government's net zero commitments.

Rail Network Enhancements Pipeline (UK Government)[2]

- *Keeping people and goods moving smoothly and safely*: The study responds to both the 'smoothly' and 'safely' elements of this RNEP statement as it will recommend several safety-specific improvements on the Marches as well as provide opportunity for a more consistent level of service for both passenger and freight trains.
- *Delivering the benefits from committed programmes and projects already underway*: The study reinforces the need for full use of the Welsh operator's new class 197 fleet, purchased by Transport for Wales to offer the increased services that will be proposed as part of the ITSS in this study.
- *Offering more: new and better journeys and opportunities for the future*: The study will test ITSS scenarios that will unlock new rail connectivity to an area which is underserved by rail but is one of the primary hubs for commuters and tourism via the line of route.

Well-being of Future Generations Act (Welsh Government)[3]

- *A society that enables people to fulfil their potential no matter what their background or circumstances (including their socio-economic background and circumstances):* The study seeks to identify and enable additional services along the corridor, aligning with key stakeholders' aspirations that respond to the need for better connectivity from local towns where social deprivation is prevalent. The provision of better connectivity proposals will open employment and commuting opportunities for those living in smaller locales along the Marches corridor.
- *Attractive, viable, safe and well-connected communities:* The communities along the Marches corridor have the potential to be made more attractive by an improved train service which this study seeks to propose.

Llwybr Newydd (Welsh Government)[4]

- *Allow people and goods to move easily from door to door by accessible, sustainable and efficient transport services and infrastructure*: Priority 2 of the Wales transport strategy certainly has the potential to improve the safety and frequency of transport services, extending the geographical reach of public transport into rural Wales by looking at train service specifications that connect communities to locations further afield.
- *Encourage people to make the change to more sustainable transport*: The study's purpose is to identify improvements that will transform the customer experience on public transport, including reliability and punctuality that will improve performance on the line and encourage passengers to use the railway more frequently.

[2] Rail network enhancements pipeline - GOV.UK (www.gov.uk)
[3] Well-being of Future Generations (Wales) Act 2015: the essentials [HTML] | GOV.WALES
[4] Llwybr Newydd: the Wales transport strategy 2021 | GOV.WALES

Wales and Borders

North Wales Transport Commission[5]

- *Implement a signalling improvement scheme at Gobowen on the Shrewsbury-Wrexham-Chester Line and dual tracking between Wrexham and Chester to address capacity constraints to enable two passenger trains per hour and freight services to operate effectively and reliably:* The study looks at appropriate infrastructure interventions in response to service enhancement aspirations which included those recommended by the North Wales Transport Commission.
- *We recommend that all bus and rail stations and interchanges are served by direct, high-quality pedestrian and cycle routes that have priority, and have more and better cycle parking:* The study seeks to make 'quick win' recommendations at stations, as well as recognise and support proposals for first and last mile travel.

Department of Transport (DfT) Outcome Delivery Plan[6]:

- *Improve connectivity across the UK and grow the economy by enhancing the transport network, on time and on budget:* The choices for funders set out in this study will offer the potential for new revenue streams, as well as encourage betterment opportunities that will make rail travel more attractive to passengers and increase footfall.
- *Build confidence in the transport network as the country recovers from COVID-19 and improve transport users' experience, ensuring that the network is safe, reliable and inclusive:* Better connectivity from Mid/North Wales to key hubs on/near the Marches will connect poorer and more socially deprived communities to key business hubs, responding to the need to be inclusive in offering better commuting opportunities to local passengers.

Transport Investment Strategy[7]

- *Create a more reliable, less congested, and better-connected transport network that works for the users who rely on it:* The choices for funders set out in this study support improving connectivity for Marches line users and will support a performance improvement that could offer a more reliable service along the route.

DfT Strategic Priorities

- *Boosting economic growth and opportunity:* Facilitating better connectivity and enhancing the passenger experience along the corridor will promote rail travel and boost economic opportunities in the region.
- *Building a One Nation Britain:* The choices for funders within this study are inclusive of extending services between Wales and England, bringing new inter-country travel opportunities in Britain.
- *Improving journeys:* The study proposes a series of changes that will make all-round improvements to passenger journeys.

[5] North Wales Transport Commission Final Report (gov.wales)
[6] DfT Outcome Delivery Plan: 2021 to 2022 - GOV.UK (www.gov.uk)
[7] Transport investment strategy - GOV.UK (www.gov.uk)

Wales and Borders

Overview of strategic questions

Summary

This report presents the findings of the Marches Corridor Strategic Study, led by Network Rail in consultation with partner organisations and stakeholders.

The report seeks to respond to the headline question outlined below:

How can the Welsh Marches line and the Shrewsbury – Chester line accommodate stakeholder aspirations that best support sustainable economic and social growth in Wales and borders?

The strategic objectives for the study are set out below and have formulated the sub-questions that seek to respond to the wider headline question.

SQ1) How can the Marches line best support its key markets, taking cognisance of post-covid behaviour and demand growth in the study area?

Objective: Understand the varying markets along the corridor and the way in which the railway is used:

- Identify any opportunities for connectivity improvements along the corridor, taking cognisance of rural locations and different multi-modal first mile/last mile options; in line with the Wellbeing of Future Generations Act.
- Identify socio-economic inequalities in accessing key tourist destinations, medical hubs and education institutes along the corridor and recommend solutions that will make the railway more accessible to deprived communities.
- Understand existing external investment in the area that could contribute to better connecting the railway to communities and align choices for funders with this investment, aligning with housing growth along the corridor.

SQ2) How can we make best use of the Marches infrastructure? How can infrastructure changes support future aspirations for the line?

Objective: Recommend infrastructure and/or service changes that will improve the passenger experience along the corridor and will meet both short- and long-term strategic objectives:

- Identify recommendations for making better use of the existing infrastructure along the corridor that can create long-term passenger experience improvements.
- Identify recommendations which require infrastructure interventions to improve long-term passenger experience along the corridor.
- Consider how revenue and social value can align by proposing changes that may not necessarily require significant financial spend.
- Identify opportunities for generalised journey-time savings for passengers, taking cognisance of the freight market.
- Draw attention to high-risk level crossings on the route and recommend ways of maximising opportunities to respond to the associated safety issues.

Wales and Borders

SQ3) What is the role of rail in the Marches corridor in supporting the roadmap to net zero?

Objective: Understand the road to decarbonisation on the Marches route, in line with UK Government's 0% carbon emissions target of 2050 and Welsh Government's Wellbeing of Future Generations Act:

- Identify opportunities for freight increases on the route to reduce carbon emissions in line with Welsh Government's 2030 net zero carbon status target.
- To identify opportunities to increase public transport mode share within the study area, to contribute to decarbonisation targets.
- Review existing decarbonisation plans along the corridor, based on regional Wales & Western Regional Decarbonisation Strategy.

SQ4) How can stations on the Marches be made fit for the future?

Objective: Establish how to make stations along the corridor fit for the future:

- Identify opportunities to enhance passenger experience at stations.
- Meet improved accessibility requirements with consideration given to the 2015 code of practice for any advised infrastructure changes.
- Attract investment at stations along the route, responding to capacity and connectivity restraints.

Why these questions?

In working closely with our key stakeholders (see Table 1), Network Rail identified room for improvements on the Marches line.

Midlands Connect	Transport Focus
Transport for Wales Rail	Transport for Greater Manchester
Transport for Wales	West Midlands Rail Executive
Great Western Railway	Newport City Council
West Midlands Trains	Torfaen County Borough Council
DB Cargo	Monmouthshire County Council
Freightliner Limited	Herefordshire Council
GB Railfreight	Telford & Wrekin Council
Rail Freight Group	Shropshire Council
Marches Local Enterprise Partnership	Wrexham County Borough Council
Cheshire West & Chester Council	Ceredigion County Council
Cheshire East Council	

Table 1 - List of stakeholders involved in this study

As a line of route within Wales and Borders that is a significant generator of revenue and plays a significant strategic role linking North, Mid and South Wales, and to North West England, there is an opportunity to improve the line's offering to passengers. If the right infrastructure enhancements are identified, then real improvements could be made to a line of route which has maintained a status quo offering over the last decade.

Wales and Borders

These questions were formulated firstly with the purpose of understanding the existing markets and how the railway is used along the Marches. There are numerous local authorities and transport bodies with aspirations for improvements in this area that have fed into this study, however it was important that the questions also enabled us to respond to the needs of the passengers. The questions were framed in such a way that has allowed Network Rail to reflect on contextual evidence provided by economic analysis and a series of surveys commissioned as part of the study, painting a picture of connectivity, service, and station facilities gaps.

Network Rail is keen to achieve close working relationships with our key partners in the Wales and Borders route to ensure that our strategic priorities are closely aligned and as Transport for Wales (in their role as the Welsh transport authority and owner of its namesake TOC) are also keen to deliver improvements on the Marches corridor, Network Rail has sought input from the Welsh transport authority at key stages, including the remit stage where these questions were formulated. The strategic questions target the aspirations of stakeholders for further development of the network, as well as ensuring that investment choices proportionally reflect the significance of the corridor.

These questions also align closely with new national legislation in Wales, the Wellbeing of Future Generations Act. The act sets out a series of goals that include working towards a Wales of cohesive communities, a globally responsible Wales, a prosperous Wales, and a more equal Wales. In setting focus on connectivity, decarbonisation, facilities at stations and service improvements, the study choices for funders will respond to these goals.

How have we undertaken the study?

The study has been undertaken consistent with a wider approach agreed for Network Rail strategic studies regionally and nationally. The following activities/stages were followed to prepare the study:

- Evidence gathering from Marches Stakeholder forum (held as part of the initial stages of this study) - attended by Train Operators, local authorities, Midlands Connect STB, Transport for Greater Manchester, Transport Focus, Freight Operating Companies, Network Rail economic analysis, Network Rail Advanced Timetable Team and the Marches Local Enterprise Partnership – to understand aspirations and issues on the corridor.

- Produced study remit using outputs of forum; agreed with stakeholders.

- Contextual evidence analysis: Market usage by journeys and revenue, connectivity and capacity analysis and mode share, carried out by Economic Analysis team.

- Station site visits along the corridor to understand their condition, facilities, and usage, carried out with Senior Station Capacity Manager.

- Development of Indicative Train Service Specifications (ITSS), a proposed vision for passenger and freight train services in the corridor.

- Capacity analysis of ITSS options, demonstrating whether interventions are required, carried out by the Advanced Timetable Team.

- Economic analysis of ITSS options.

As outlined above, the study remit was agreed in consultation with passenger and freight stakeholders and regular engagement has been undertaken throughout. Further stakeholder forums were held with both the railway industry and regional and local stakeholders to discuss the outputs of the ITSS capacity analysis and economic analysis learnings.

The support and assistance of the stakeholders referred to in this section is gratefully acknowledged.

Role of Economic Analysis

Network Rail's Economic Analysis team played a key role in providing a contextual overview of the rail corridor along the Marches, quantifying the existing markets along the route, and demonstrating the key flows and hubs utilised within this geography. This provides an evidence-based narrative for future funding decisions. The analysis carried out by the team was integral to understanding what the route currently looks like and where targeted improvements could be made, in line with critical data sources such as covid recovery levels, capacity heat maps and connectivity datasets.

Some of the key activities undertaken by the team are outlined below:

a) Analysis of key flows along the corridor, by journeys taken and by revenue, both for inter-corridor travel and travel to destinations outside the Marches line.
b) Identification of key station hubs by origin and destination for commuting, business, and leisure travel.
c) Collation of demand recovery figures versus pre-pandemic levels for stations along the corridor.
d) Capacity and connectivity gap analysis for current demand and forecast passenger demand.
e) Identification of mode share figures across the corridor.
f) Quantification of benefits and disbenefits associated with the ITSS options outlined in this study.

Role of the Advanced Timetable Team

The Network Rail Advanced Timetable Team modelled the Train Service Specifications outlined in this study; there are five ITSS phases, with an intermediate phase between the baseline ITSS and ITSS 2. The five phases build upon each other to deliver an optimal service provision for passenger and freight users. This process was undertaken to assess whether the changes and improvements made within each ITSS phase could be accommodate on the Marches line network and whether they trigger any requirement for infrastructure changes.

The base timetable used was the December 2023 timetable, the most recent timetable change completed at the point of writing this study. Committed service changes were considered, however due to the infrastructure changes required to facilitate these commitments, no definitive timescale and no definitive service level was formalised prior to the commencement of the ITSS work. Due to the non-clock-facing nature of the services on this line, the infrastructure limitations and the extensive geography, the timetable considers a weekday window between 1000 and 1600, rather than the standard hour windows considered in other studies. At the time of writing, the class 197 vehicle introduction is underway, and it has been assumed that these vehicles will be the main rolling stock on the Marches line for at least the medium term, with the Mark IV loco-hauled coaches also playing a key role in serving long-distance services.

Wales and Borders

The geographic scope of the capacity analysis was the route between Newport and Shrewsbury, and the two branches between Shrewsbury and Crewe and Shrewsbury and Chester respectively. Platform capacity at the northern hubs (Crewe and Chester) have been excluded from this analysis work with services pathed as far as the stations. Separate studies have been undertaken for both Chester and Crewe as part of Network Rail's strategic work by the strategic planning teams in the North West & Central region and internal engagement has taken place to ensure alignment where possible.

The Advanced Timetable Team was remitted to test whether the phases proposed offer a robust timetable alongside the aspirations that consider future service improvements. Where a robust timetable is not possible, the team has been asked to identify the infrastructure requirements that would facilitate a resilient ITSS, and these are detailed within this study.

The team has also been integral to defining the number of additional trains in both directions; data which has been utilised to identify whether these ITSS proposals can be operated safely over the existing level crossings.

Wales and Borders

What does the Marches look like today?

Summary of the route and key hubs along the corridor

The Marches line traverses the Wales-England border from Maindee Junction near Newport in a northerly direction to Shrewsbury and onward to Crewe. A separate line departs from Shrewsbury to Chester toward North Wales that is also considered as part of the scope of this study.

Hereford and Shrewsbury, the largest of the destinations on the Marches, are significant regional employment and educational hubs at the heart of the Marches. These hubs provide onward connectivity into large cities in England and Mid Wales, respectively. Newport, Crewe, and Chester at the boundaries of this study are also key transport hubs, with onward connections to the Welsh capital and West Wales, London, Manchester, Liverpool and the North Wales Coast.

Figure 2 - Line Diagram of the geographic area covered by this study

What is the rail infrastructure like?

The Marches infrastructure spans four ELRs (Engineering Line Reference); HNL1, SHL, SYC and WSJ2. Despite its longevity, the infrastructure performs well from an asset reliability perspective.

Line speed is varied for multiple units, with speeds varying between 15mph (for entry into loops) and 90 mph. Significant portions of the infrastructure allow for 80 and 90 mph speeds. Locomotive-hauled trains are restricted to lower speeds on some sections, but many of these restrictions have recently been removed after remedial work.

Rail age varies along the respective ELRs, with a large proportion of the rail age dated to early 2000s or within the last decade, likely as part of rail replacement schemes. A significant proportion of rail on each of the ELRs also date back to the 1970s and 1950s, with some rail in place from as early as 1934 on the HNL1 and later in the 1930s on the SHL and SYC.

The track consists of Continuously Welded Rail on concrete or steel sleepers with a mixture of ages. The main challenging areas for track maintenance are around Shrewsbury Station with its unique layout, as well as large amounts of S&C on curves due to the mechanical signalling. Over 50% of the infrastructure is allocated a track category score of 1, 2 and 3; suggesting that frequent inspections are in place to monitor track condition (track category scores are 1A – 6, with scores above 3 being subject to more frequent inspection). Most of the route is now managed via a risk-based maintenance regime (RBM) relying on train-borne data capture and less frequent inspections on foot; the exception being the WSJ2. It is important to note that RBM covers plain line track only, and most of the S&C (with exception of S&C at Craven Arms and Tram Inn) is still maintained under the former TRK/001 regime. Under this regime, the track would be inspected more frequently looking for any faults, and defects would be actioned at more severe levels.

Wales and Borders

The Newport to Shrewsbury line and the Shrewsbury – Chester line is primarily a mechanically signalled route, split into many block sections. Most of these block sections are controlled by mechanical signal boxes which, along with their controlled trackside assets, are over 50 years old. Although these assets are older, they are physically well maintained. Signalling comprises a mix of colour light and semaphores. Obsolescence challenges with track circuits are managed with annual minor renewals, though obsolescence more generally is not considered to be an issue for mechanical signalling with spares and competencies currently available. Some challenges are seen in poor performing assets (such as points) around Shrewsbury station area, and via initiatives are being returned to their 'design specifications' as part of minor works. The irregularity of Intermediate Block (IB) signals on the Down line is also detrimental to an effective performing railway.

Craven Arms

The Shrewsbury – Crewe line (SYC) is modernised modular colour light signalling (north of Crewe junction) with electronic components.

Feature	Status
Loading Gauge	W8
Electrification	Crewe station only
Route Availability	RA8
Level Crossings	HNL1 – 49 crossings SHL – 80 crossings SYC – 46 crossings WSJ2 – 45 crossings
Line Speed	Various between 15mph and 90mph
Signals	Mechanical, modular

Table 2 - Infrastructure Specifications

What are the current service specifications/timetable?

A new timetable change was implemented in December 2023. The corridor does not operate a clock-face timetable and some services are irregular throughout the day. Network Rail recognises that further timetable changes have been implemented since December 2023, however the analysis for this study was based on the next timetable change (which at the time was December 2023).

Wales and Borders

The following timetable outlines the passenger services as of December 2023, operating between 10am and 4pm (off-peak hours) on a weekday:

Origin	Destination	TOC	Tph	Calls (in corridor)
Cardiff Central	Manchester Piccadilly	TfW	0.5	Newport, Cwmbran, Pontypool & New Inn, Abergavenny, Hereford, Leominster, Ludlow, Craven Arms, Church Stretton, Shrewsbury, Wem, Whitchurch (Shropshire), Nantwich, Crewe (but not all trains call at all of these stations)
Milford Haven	Manchester	TfW	0.5	Newport, Cwmbran, Pontypool & New Inn, Abergavenny, Hereford, Leominster, Ludlow, Craven Arms, Church Stretton, Shrewsbury, Wem, Whitchurch (Shropshire), Nantwich, Crewe (but not all trains call at all of these stations)
Cardiff	Holyhead	TfW	0.5	Newport, Cwmbran, Pontypool & New Inn, Abergavenny, Hereford, Leominster, Ludlow, Craven Arms, Church Stretton, Shrewsbury, Gobowen, Chirk, Ruabon, Wrexham General, Chester
Chester	Crewe	TfW	1	Chester, Crewe
Shrewsbury	Crewe	TfW	0.5	Yorton, Wem, Prees, Whitchurch (Shropshire), Wrenbury, Nantwich, Crewe
Hereford	London Paddington	GWR	0.5	Hereford
Hereford	Birmingham New Street	WMT	1	Hereford
Swansea	Shrewsbury	TfW	Irregular 6 trains per day (4tpd as of Dec 24)	Shrewsbury, Church Stretton, Craven Arms

Table 3 - December 2023 Services

Whilst there are several consistent freight flows along the corridor, the paths available exceed what is regularly utilised (as outlined later in this study).

The extract in Appendix 1 was pulled from the 10am-4pm weekday schedule and identifies the paths available during this time frame to the Freight Operating Companies (FOCs). It is relevant to note that some of these paths are very unlikely to run in the short-term and are not necessarily heavily utilised at present (e.g, Ernesettle to Glen Douglas), however they could become more viable on a frequent basis in the long-term. Furthermore, those paths identified as 'Network Rail Virtual Freight Company' are not currently operated by a given FOC and are opportunity paths.

Wales and Borders

What are the key safety and performance challenges?

Performance on the Marches has been historically poor in comparison with other lines on the Wales and Borders route. The corridor saw a steady decline in performance in periods within 2022/2023 and 2023/2024, owing primarily (according to data) to the transitional period in fleet change and train crew resource issues. The following visuals are driven by 'on time to one' data, as this is an industry-wide train performance measure, however it is important to note that individual operators will have tailored metrics. Publicly available data from Operators may differ numerically but should show similar trends. The data shows that on time performance was at 59.8% in 2021/2022, dropping to 48.2% and 48.3% in 2022/23 and 2023/24 respectively (as shown in figure 3 below). Notably, during the years 2022/2023 and 2023/2024, the class 175 fleet suffered from thermal incidents and were consequently withdrawn. This will have had a significant impact on these figures.

The year 2024/2025 tells a more positive story up to June 2024, with average on time performance increasing to 60.5%. This improvement is due to the transition to an all 197/Mark IV operation, Network Rail's signaller recruitment to respond to existing shortages and targeted work by the local performance team to identify worst performing headcodes, challenge poorly adhered to dwell times and train planning rules. There is however significant improvement to be continued to be made.

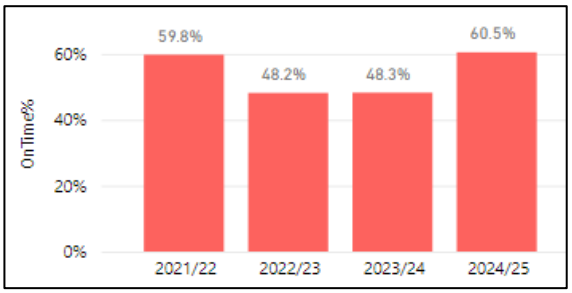


Figure 3 – Year on Year performance trend – 'on time to one'

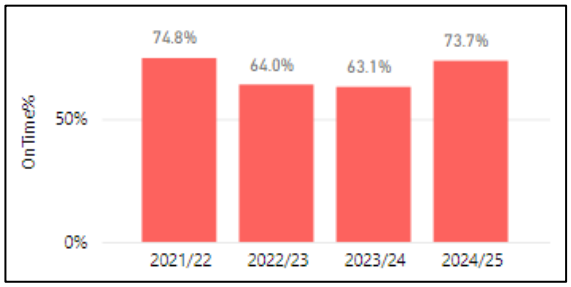


Figure 4 – Year on Year performance trend – 'on time to three'

The Year-on-Year trend if we reflect on data for 'on time to three' (such as reported by Operators) was as follows, showing a 73.7% performance of trains arriving within three minutes of its scheduled time on the corridor in 2024/2025.

Figure 5 provides an overview of performance by period over the last full 26 periods (two years – 'on time to one'). Whilst the overarching view is poor, there is demonstrable improvement over the last six periods.

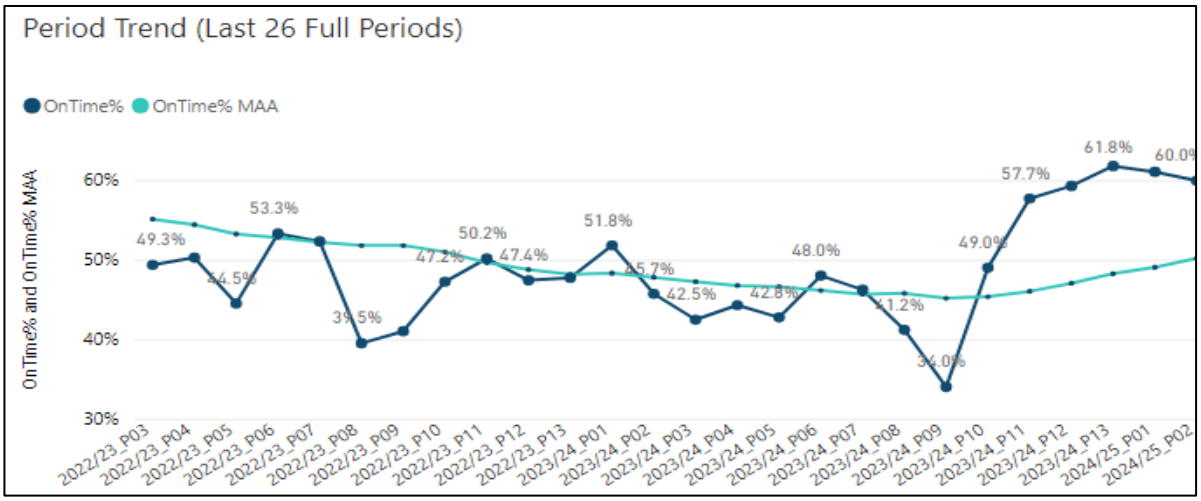


Figure 5 – Performance by period over the last full 26 periods (two years) – up to Period 2 24/25

Fleet challenges have been a particular driver in delay incidents (see figures 6 and 7). TfW's existing fleet of class 150, 153, 158 and 175 have been in the process of being replaced over the last few years, with the introduction of the Mark IV loco-hauled coaches and the phase in of the class 197. A significant number of the recorded fleet incidents were allocated to technical fleet delays, which could be attributed either to the ageing stock or to potential teething issues with the introduction of the class 197. Figure 6 shows the data captured at the onset of this study in early 2023, in comparison with 2024/25 data: showing a significant reduction in fleet-related issues. This is likely due to better availability of the Class 197 and Mark IV fleets, resulting in less substitution with Class 150 and 153s which are unable to meet the running times.

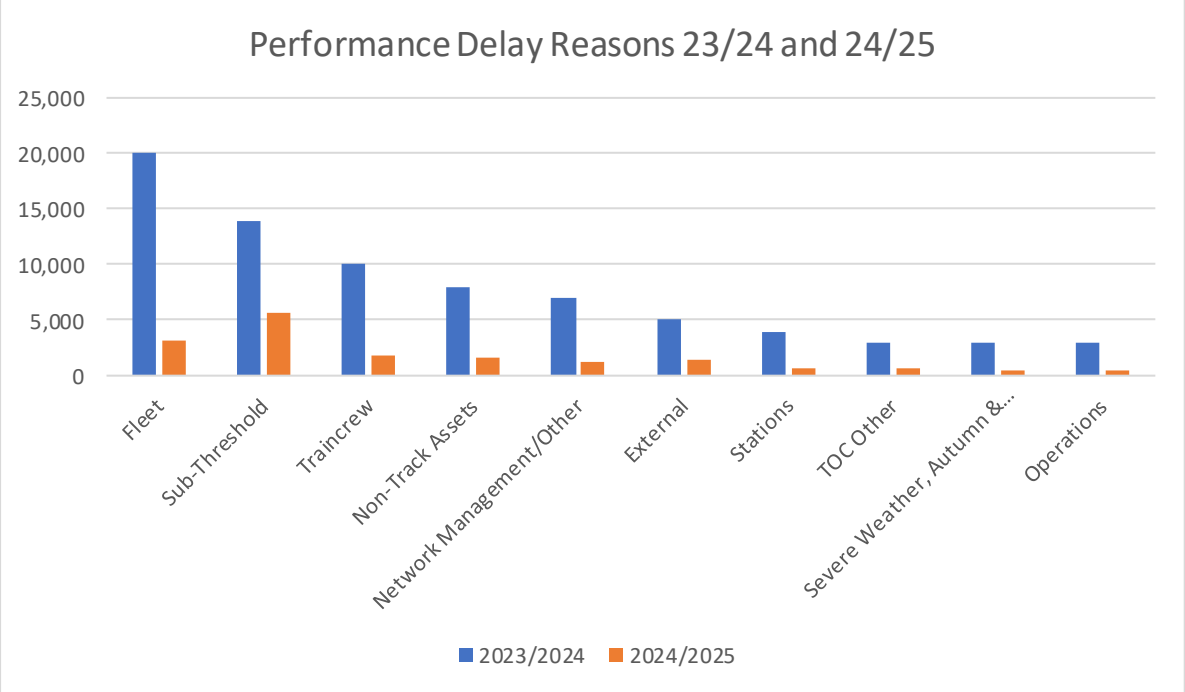


Figure 6 – Performance delay reasons at the start of 2023/2024 and at the start of 2024/2025

Performance is particularly poor at smaller, less serviced stations along the corridor such as Ludlow, Leominster and Craven Arms. Historically, there are regular knock-on incidents from Heart of Wales line (HOWL) traffic transitioning onto the Marches adjacent to Craven Arms; the token operation in place on this infrastructure can often create a delay at Craven Arms with a single late-running unit from the HOWL, as on-time units on the Marches will be held in response. The December 2023 timetable has mitigated this, in part, by splitting the HOWL operation from the Crewe – Shrewsbury shuttle; however, perturbation from the HOWL can still be transmitted, albeit over a more limited geography.

Responding to delay incidents is difficult on the Marches, with the lack of flexibility in being able to recover failed units being detrimental to reducing the extensiveness of a given delay and often protracting the time lost. Flexibility is particularly lacking on the Down line (southbound direction towards Newport) where the distance between available loops is greater than on the Up. It remains difficult to move late-running freight into the loops regardless, as the gradients are steep on the Marches and stopping a heavy freight unit could result in train failure. The communication of delays is also a factor in train performance as the lack of automatic signalling (particularly at Shrewsbury) causes a delay in time recordings being available to the Wales Route Operating Centre (WROC),

often giving no advanced warning if a unit is collecting delay as it continues along the corridor. In Absolute Block, the train delay is updated manually by the signaller when the train passes the signal box and therefore delays are not recorded until the next section. Furthermore, the long block sections along the route exacerbate a delay and without the flexibility of bi-directional working, a unit must often continue a significant distance before it is out of the path of another unit.

Local signallers have advised that the lack of Intermediate Block (IB) signal on the Down line (between Abergavenny and Pontrilas) is detrimental to an effective performing railway, as there are consistent issues around 1pm daily within the extensive block section. Contrastingly, there is an additional IB signal on the Up that allows for some additional, though not significant, flexibility. Additionally, although there are loops present along this stretch of the infrastructure, they are semaphore signalled which requires a vehicle to slow down significantly before entering the loop (in the case of Pontrilas Up Loop and Wooferton Up Loop).

South of Abergavenny

Year to date (YTD) for 2024/2025 safety performance is thus far more positive in comparison with 2023/2024, which was challenging for the Wales and Borders route and saw some significant incidents on the Marches line responsible for a significant contribution to delay minutes.

Ponthir level crossing (on the HNL1 between Newport and Cwmbran) had among the highest incident count across the Wales and Borders route by end of year 2023/2024, with 14 incidents resulting in 66 delay minutes and the 2nd highest incident count across the Wales and Borders route for 2023/2024. Shrewbridge Road level crossing in Nantwich had the 7th highest incident count, incurring 63 delay minutes. By period 13 of 2024, Marshbrook Level Crossing (near Church Stretton)

Wales and Borders

had incurred the highest number of delay minutes for the period (46 minutes) due to a car striking a level crossing light on the downside, preventing the barriers from lowering. As these are some of over 200 level crossings on the corridor; the Marches is a standout line of route for safety-related issues at crossings. Similarly, since April 2024, Weston Rhyn Level Crossing has imported 707 delay minutes on the route, whilst Newport sits in the top 10 locations by delay minutes with 441 delay minutes total.

The hubs along the corridor are also often challenging for route crime (trespass, anti-social behaviour, concern for welfare etc), with Newport, Cwmbran, Hereford, Shrewsbury, Gobowen and Wrexham General seeing the most incidents generally. Vandalism was rife in 2023/2024, with Pontypool & New Inn and Wrexham General areas within the top 10 locations by incident count in the Wales and Borders route and Pelham Road Bridge in Shrewsbury being the location with the highest number of delay minutes by end of year for vandalism-related incidents, incurring 755 minutes total. Similarly, Ross Road bridge in Hereford suffered 765 delay minutes due to trespass-related crimes and was 9th across the route for the highest delay minutes incurred for trespass.

What are the key capacity constraints?

There are a variety of well-known capacity constraints along the corridor which prevent significant service enhancement on the Marches line. Key constraints are as follows:

- 220 level crossings identified along the corridor adopting additional risk with any service increases.
- The Newport – Shrewsbury and Shrewsbury to Chester routes are primarily mechanical signalling with extensive block sections in some locations.
- Lack of loops along the corridor to provide flexibility for failed trains and freight use, given the length of the available loops.
- Platforming at Shrewsbury; the station is currently at capacity without intervention.
- The Marches is a two-track railway, accommodating long-distance, short-distance and freight traffic.
- Topography with steep gradients.

Wales and Borders

SQ 1 – How can the Marches line best support its key markets, taking cognisance of post-covid behaviour and demand growth in the study area?

What are the key markets along the route?

The Marches line caters to a number of different markets due to the length and geographical nature of the line and the extensive communities served by the rail service. The line serves the long-distance markets between South Wales and key northern destinations such as North Wales, Merseyside and Greater Manchester and offers connectivity to other key hubs such as West Wales and Birmingham with a change at Shrewsbury. It also responds to local Welsh markets for travel into Cardiff from South Wales stations like Cwmbran, Pontypool & New Inn and Abergavenny.

Both leisure and commuter markets are significant along the route. Shrewsbury is undoubtedly a key station on the Marches with the greatest volume of both leisure and commuter travel (as well as being a key interchange station), with Chester, Crewe and Hereford also showing significant volumes of traffic for both markets. Interestingly, some smaller stations along the route; specifically, Leominster, Ludlow and Abergavenny have significant patronage, despite Ludlow (in particular) not receiving a consistent level of service. Figures 7 and 8 below demonstrate the annual demand for weekdays and weekends by commuter travel (left) and leisure travel (right) – this is based on LENNON ticket sales data for 2019 (pre-covid).

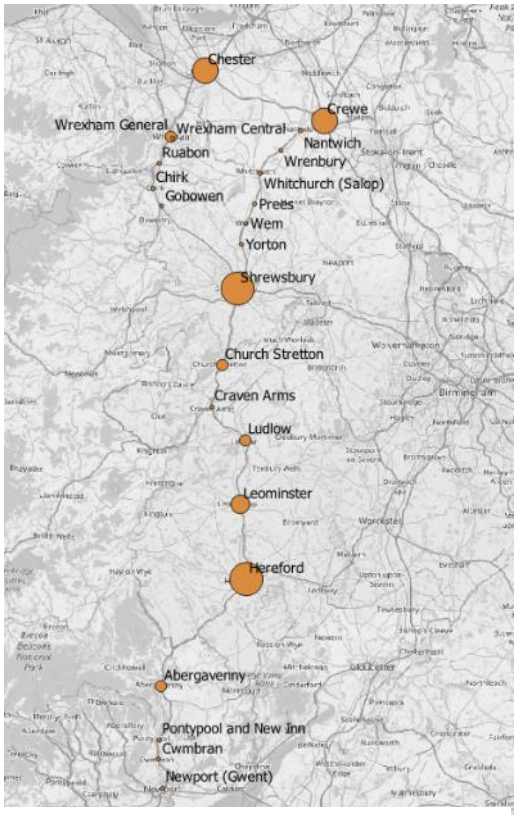


Figure 7 - Annual demand for commuter travel

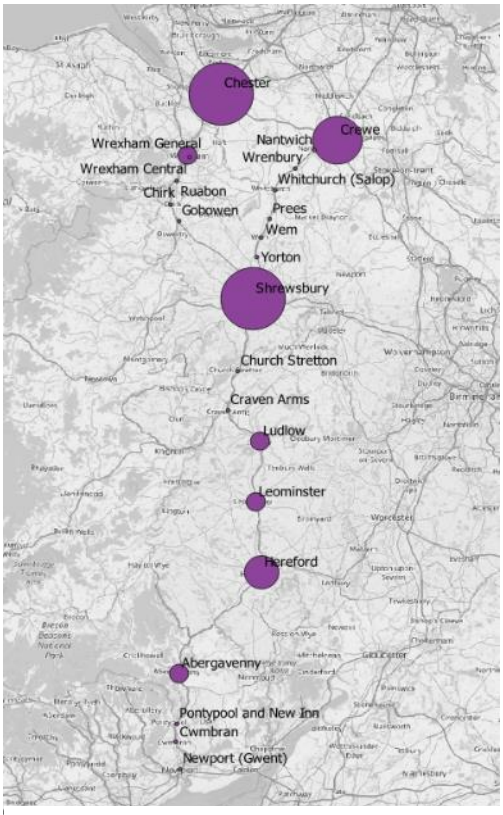


Figure 8 – Annual demand for leisure travel

Wales and Borders

Commuter and leisure markets have been further broken down by key flows; looking at those internally to the Marches by journey and revenue and separately from Marches origins to external destinations (also by journey and revenue).

Internal commuter travel centres around Hereford from nearby stations at Leominster, Ludlow and Abergavenny (see figure 9). This is likely the extensive college market travelling to/from Hereford. Subsequent commuter travel flows are unsurprising and reflect nearby communities travelling to/from key Marches hubs for employment, the busiest of these flows being Wrexham – General to Chester, Church Stretton – Shrewsbury and Crewe – Nantwich.

The primary journey made for both commuter and leisure travel is between Chester and Crewe, however this data likely considers journeys made via the Marches line (via Shrewsbury) as well as those journeys directly between Chester and Crewe which is outside the scope of this remit.

Leisure travel follows a similar pattern to commuter travel with passengers travelling to/from key hubs in Hereford, Chester, and Shrewsbury. The majority of key flows outlined in the leisure journey travel below are to these hubs, which is to be expected given the tourism status of these cities/towns, as well as their proximity (in Hereford's example) to nearby local communities which are likely to use Hereford as a regular day-out destination for shopping or dining.

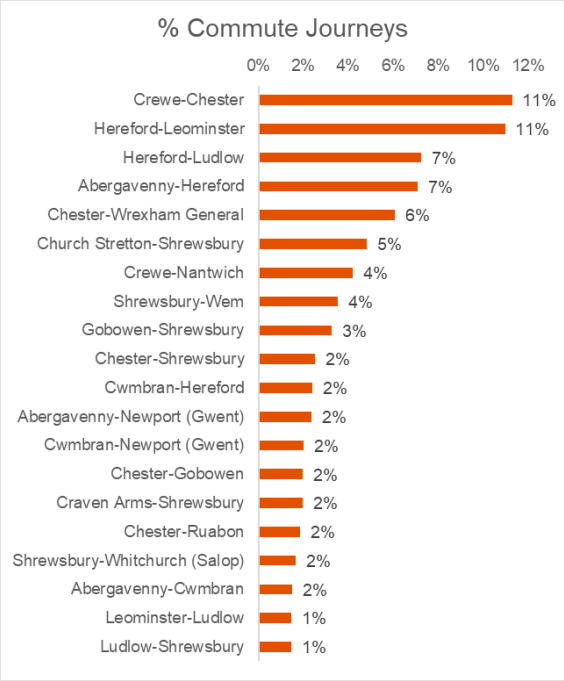


Figure 9 – Internal key flows by journey (commuter)

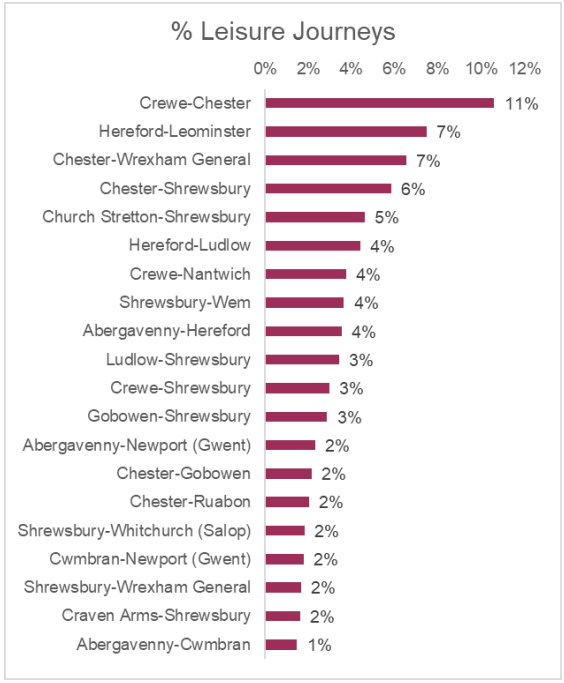


Figure 10 – Internal key flows by journey (leisure)

Internal key flows by revenue align with the data from journey flows, showing (in Figure 11) that the commuter revenue between Hereford and local stations account for almost a quarter of the total revenue for the Marches line on a given day. Travel between Chester and Shrewsbury is prevalent for the leisure market, with 6% of the total revenue obtained via that flow alone.

Wales and Borders

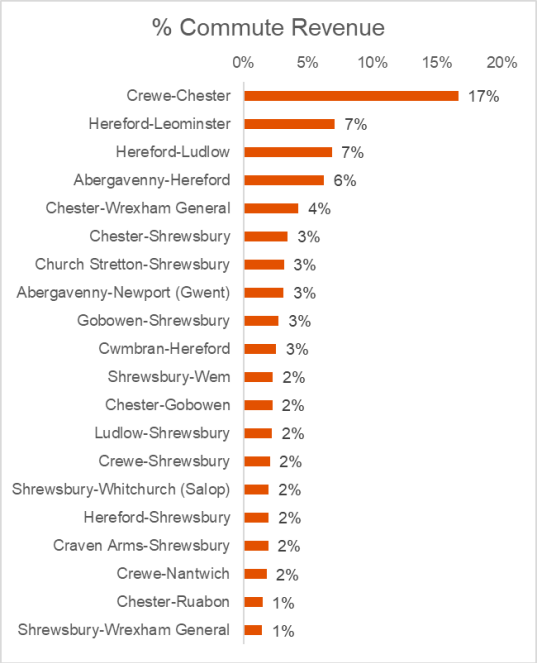


Figure 11 – Internal key flows by revenue (commuter)

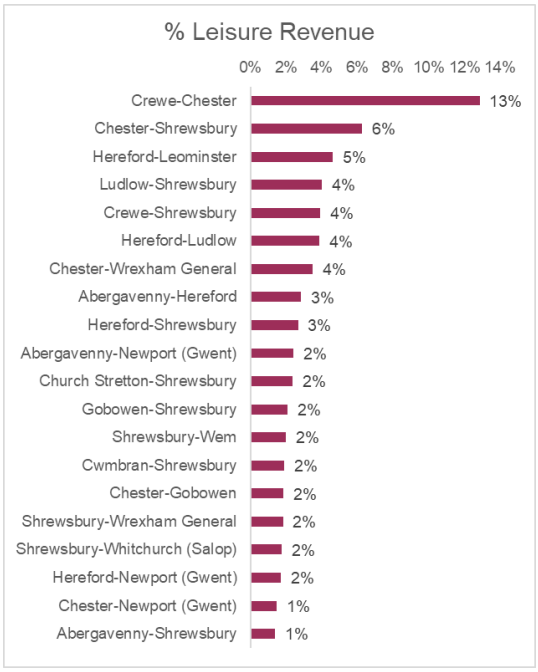


Figure 12 – Internal key flows by revenue (leisure)

Business travel makes up a comparably small part of the journey purposes along the Marches corridor, however it is prevalent for onward connectivity to key external hubs such as Cardiff, London, Manchester, Liverpool and Birmingham.

As with business travel journeys, the Marches offers significant connectivity to onward hubs external to the corridor, with key access for commuters and leisure travellers to Cardiff, Liverpool and Manchester. 19% of all journeys made to external destinations are made by the commuter market between Cardiff and Newport (see Figure 13) and the highest percentage of leisure travel (Figure 14) is made within the same flow - this is based on LENNON ticket sales data for 2019 (pre-covid).

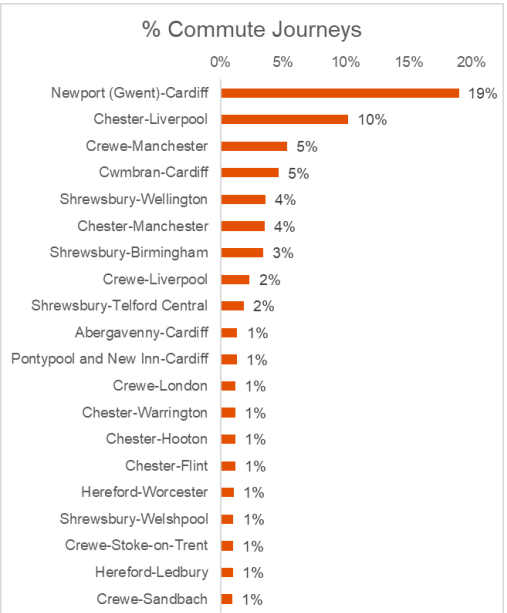


Figure 13 – External key flows by journey (commuter)

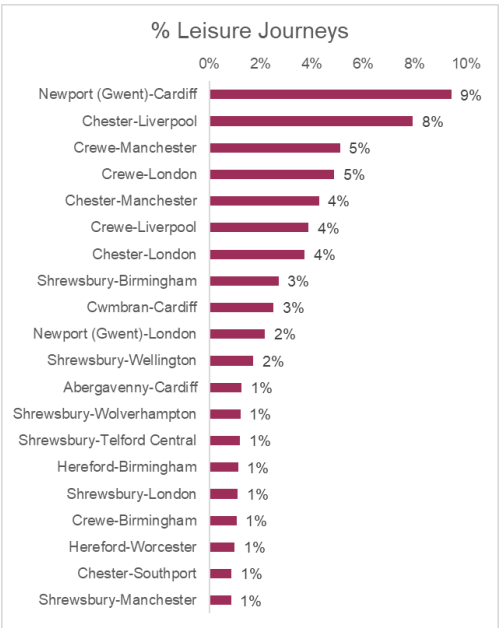


Figure 14 – External key flows by journey (leisure)

Wales and Borders

Onward connectivity from Chester to Liverpool is significant for commuter, business and leisure markets and supports Transport for Wales's aspirations to create a direct service between Cardiff and Liverpool owing to a proportion of this flow likely being interchanging passengers for long-distance travel from Cardiff. The most prevalent flow for inter-Marches travel to external locations (where a portion of the journey is made along the Marches infrastructure) is from Cwmbran to Cardiff at 5% of the overall commuter journeys made and 3% of leisure travel journeys. Abergavenny – Cardiff is the second greatest inter-Marches to external locations flow for both commuter and leisure travel and primary inter-Marches flow for business travel to external locations, for both Cardiff and London.

An overview of the internal to external travel markets on the Marches demonstrates that it is a key enabler of travel to mainline cities in both Wales and England, with the most utilised flows showing the top five destinations outside the Marches line as follows:

Rank	Destinations	Commute	Business	Leisure
1	Cardiff	231,992	34,655	388,274
2	London	29,104	204,209	352,759
3	Liverpool	116,476	33,974	334,081
4	Manchester	95,728	62,727	319,167
5	Birmingham	54,425	27,059	160,287

Table 4 – Most popular external destinations for Marches passenger travel

Network Rail commissioned on-board passenger surveys in late 2023 (545 respondents) to further evidence the market demand along the corridor and understand passenger views on travel on the Marches line. The survey outputs corroborate the work done by economic analysis from the perspective of journey purpose but also demonstrates the significance of travel for education along the corridor.

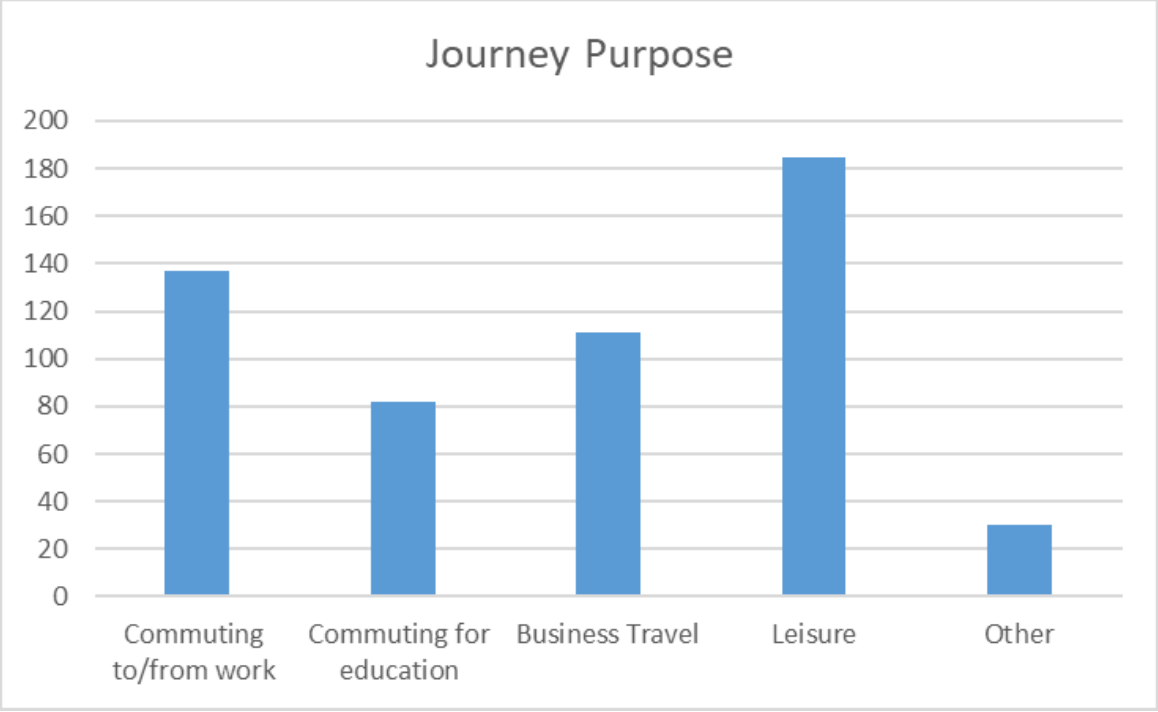


Figure 15 – Survey output; journey purpose for survey respondents

Reflecting specifically on the survey data captured, the most popular destinations for passengers using the Marches line included the key hubs identified as part of the economic analysis work (Shrewsbury, Chester, Hereford within the Marches and Cardiff and Manchester externally) but drew attention to Wrexham General as the most heavily frequented education hub (presumably for Wrexham University which is situated a ten-minute walk away from the station).

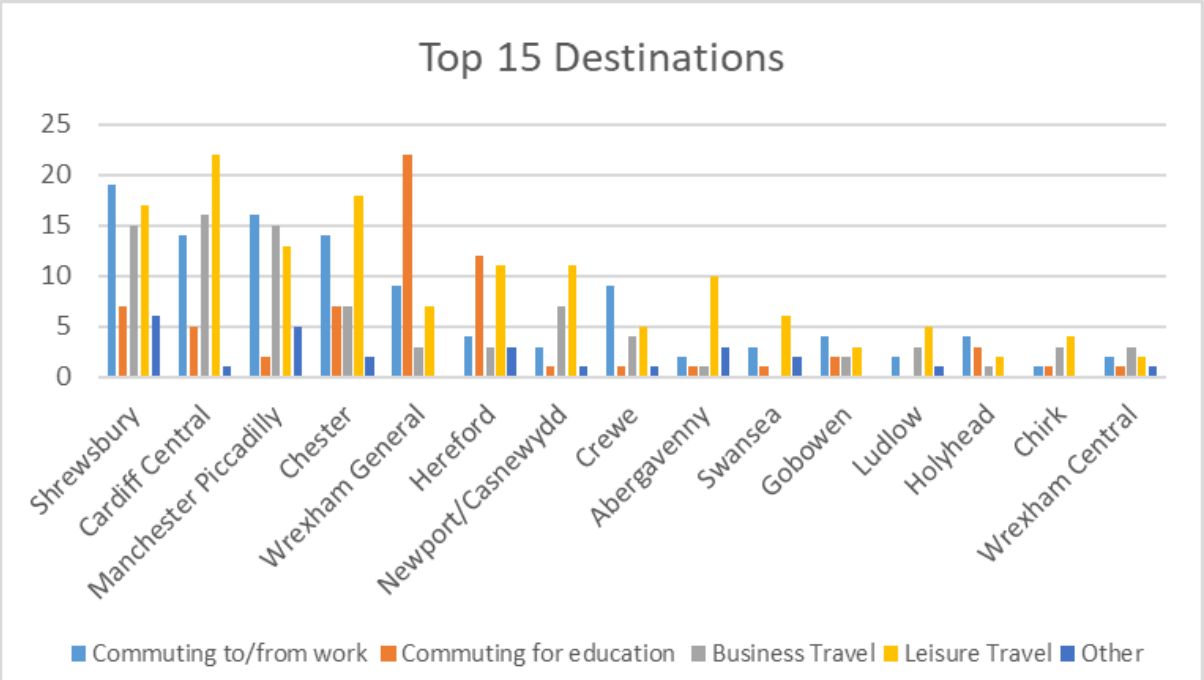


Figure 16 – Most popular destinations for passengers using the corridor, by journey purpose

The surveys also sought to capture passenger feedback on the corridor. Contextually, on the 28th of November 2023 (the date the survey was undertaken), passengers were generally pleased with the performance on the line, the lack of delay and ample capacity on-board.

Most passengers rated their journey as a 7 or higher (out of 10), with only 7% scoring 4 or lower. Most pointed to the punctuality that day and the availability of a seat as the main factors for their high score, as shown in Figure 17.

The journey was held in similar regard across different passenger profiles on this day, however those commuting for education were more likely to give the journey a lower rating. A similar proportion of respondents who travelled multiple times a month were more likely to score their journey satisfaction at a lower level compared to those who either travelled infrequently or made a few journeys a month. This suggests that whilst the performance on the 28th of November 2023 was good, the overall picture across an extended period of time is more negative.

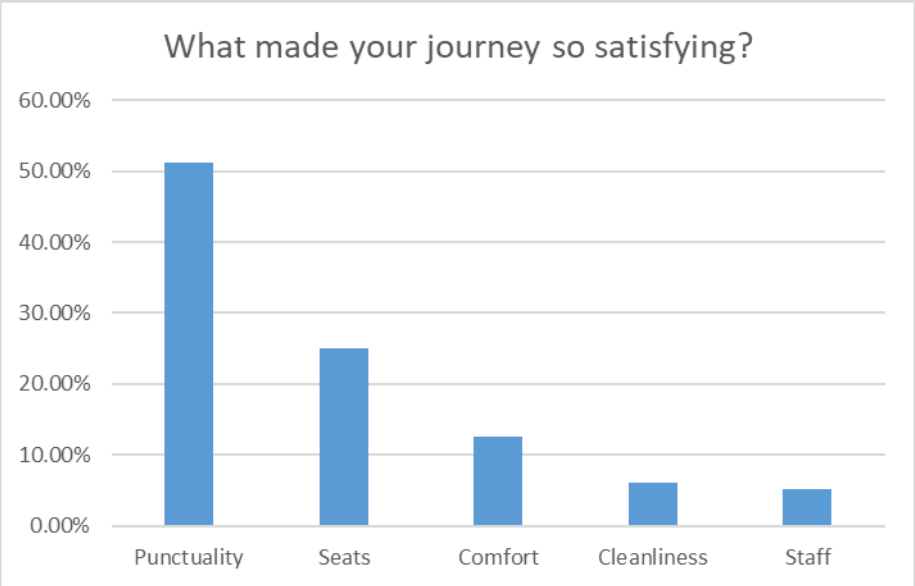


Figure 17 – Survey response identifying positive reasons for satisfaction results.

How have the markets changed post-covid?

The Independent Travel Commission (ITC) has recently published findings from the examination of the covid pandemic in a report entitled 'The longer-term impacts of the COVID-19 pandemic on Transport and Land Use in Britain.'[8] It describes the long-term impacts of the pandemic on how the railway is utilised by its passengers, which includes data demonstrating that journey purpose has shifted more generally in favour of leisure travel, as well and more varied travel patterns across a standard week. The Great British Railways Transition Team, an arms-length body commissioned by the Department for Transport to prepare for the creation of an integrated rail body, which will deliver on the recommendations of the Williams Review, has conducted research identifying that 54% of journeys in the UK are now for leisure purposes, and having previously identified that the Marches is predominantly a leisure market, it has been integral within this study to consider a strengthened all-round timetable that could be carried through to weekends as well as weekdays.

Data from the Office of National Statistics (ONS) within the ITC report states that as of January 2023, 44% of working adults either work remotely or with a hybrid-working arrangement, a significant change from pre-pandemic levels. Figure 6 in the ITC report on page 22 then highlights the difference in popularity of working remotely as of April 2023 versus January 2020, from which we can conclude that the commuter market has changed dramatically and that a consistent level of service across the day and individual weekdays would be best placed for railway services in the future, rather than a focus on providing a conventional peak-time focus on capacity and additional services. Welsh Government's remote working policy[9] (introduced in September 2020) states an aspiration to see 30% of the workforce working from home or locally on a regular basis which would support a timetable more reflective of the post-covid markets.

[8] ITC-Impacts-of-the-Pandemic-Report-March-2024.pdf (theitc.org.uk)
[9] Smarter working: a remote working strategy for Wales [HTML] | GOV.WALES

Wales and Borders

The Marches geography has a collective recovery of 71% versus pre-pandemic level demand, based on ORR estimation of station usage, published December 2023 (see Table 5). Notably, some stations have exceeded 100% recovery; Pontypool and New Inn and Leominster, which suggests a need for consistency in service for smaller stations along the route. The lowest recovery rates by a significant percentage are at Wrenbury and Prees at 64% and 67% respectively which are both located on the Shrewsbury – Crewe line of route, despite Crewe and Shrewsbury being among the top half of Marches stations recoveries. This could be owing to the existing infrequent service along the Shrewsbury – Crewe corridor. Notably, these locations are not on the Welsh side of the border where Welsh Government's remote working policy encourages working from home, however the cultural shift in some organisations promoting non-full time office working and offering more flexibility to employees (such as in Network Rail), does suggest that there is an increased potential for less commuting among those passengers living in more remote locations with a lesser service frequency.

Station	Apr 2019 to Mar 2020	Apr 2020 to Mar 2021	Apr 2021 to Mar 2022	Apr 2022 to Mar 2023	% recovery compared to Apr 2019 - Mar 2020	Trend
Pontypool and New Inn	87,170	27,766	77,550	109,042	125%	
Leominster	243,770	106,658	231,080	245,330	101%	
Ruabon	99,122	20,632	77,920	90,894	97%	
Yorton	7,544	3,004	6,494	7,292	97%	
Chirk	78,030	14,788	57,766	73,002	96%	
Crewe	4,808,977	944,147	3,519,343	3,995,628	94%	
Hereford	1,245,474	507,767	1,034,070	1,155,554	93%	
Ludlow	268,044	65,837	201,418	235,780	92%	
Shrewsbury	2,422,103	577,061	1,698,346	2,042,110	89%	
Nantwich	224,248	42,038	144,380	185,690	88%	
Craven Arms	98,770	25,374	73,282	94,850	88%	
Church Stretton	126,760	45,818	114,430	110,636	87%	
Chester	5,857,245	1,194,980	4,016,245	4,810,443	87%	
Cwmbran	412,670	107,216	262,904	353,056	86%	
Wem	102,186	24,242	74,000	86,506	85%	
Gobowen	218,970	37,790	154,392	194,734	84%	
Wrexham General	514,663	129,708	406,969	497,507	83%	
Newport (Gwent)	3,202,626	621,238	2,053,651	2,817,746	83%	
Abergavenny	415,250	102,016	283,944	359,524	82%	
Whitchurch (Salop)	144,724	23,424	94,134	116,474	80%	
Prees	6,318	1,676	3,362	4,230	67%	
Wrenbury	12,594	1,372	5,782	8,112	64%	
Marches total	**20,597,258**	**4,624,552**	**14,591,462**	**17,594,140**	**71%**	

Table 5 – Post-covid recovery rates by station

What is connectivity like along the corridor?

The connectivity challenge along the Marches corridor stems from its geographical isolation from other railway infrastructure, coupled with service frequency on the line of route.

The connectivity analysis carried out by the Economic Analysis team demonstrates that the Marches seemingly fails to deliver on effective journey times, primarily due to the infrequent service along the corridor. Despite an overall decent in-rail journey time between destinations, the route suffers from a high wait time penalty due to the low service frequency and therefore a higher overall generalised journey time (GJT), which then reflects negatively on overall connectivity. Generalised Journey Time (GJT) is a calculation which takes into account the travel time whilst on board the train, the frequency of service and an interchange penalty if not a through service. An example of this (as shown in Figure 18) would be between Church Stretton and Shrewsbury where the interchange penalty ('Wait Time') forms 60% of the overall GJT with road travel therefore showing as half the

overall travel time comparatively (despite the in-rail journey being shorter than in-car journey time). The figure also shows the rail mode share within a 3km radius of each station. This demonstrates that rail tends to be more attractive when the journey-time is longer.

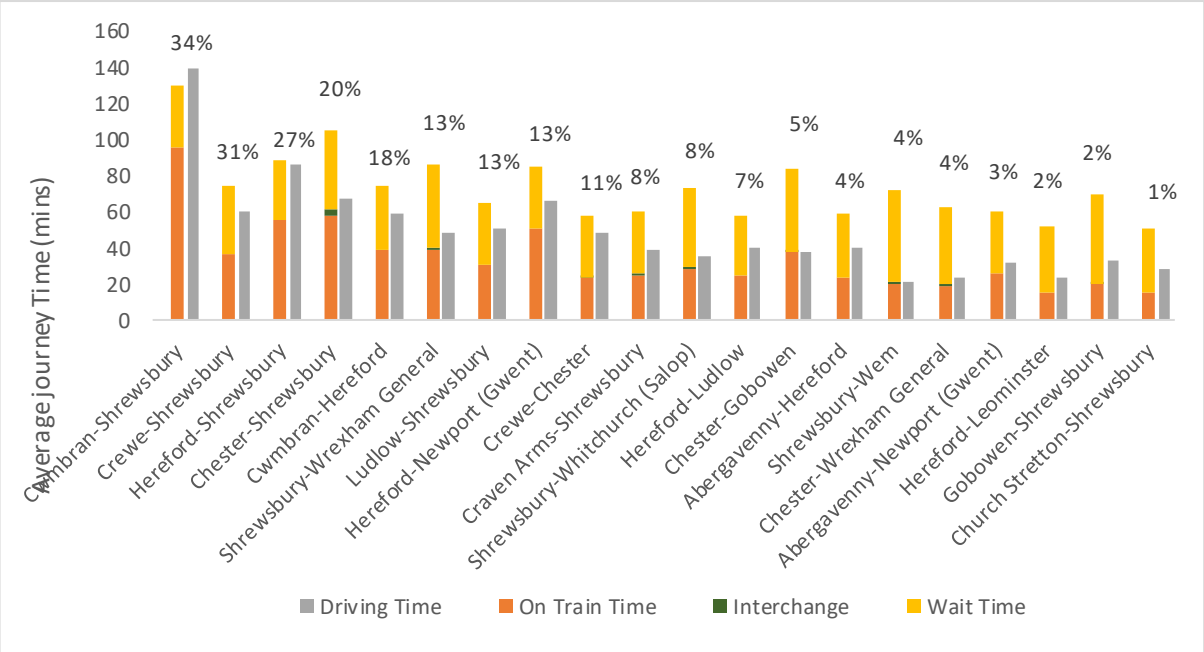


Figure 18 – Average journey time by flow, comparing driving time and overall public transport time.

Furthermore, if we reflect on a journey in the broader sense with the inclusion of first and last mile travel, there is a polarised view on connectivity. The Marches has significance for customers living in more remote areas of the country, particularly Mid Wales, due to its geography and direct connectivity to key hubs in Wales and Borders (such as Cardiff and Crewe). For passengers living in Mid Wales for example, the Marches offers a more attractive travel option than the lesser frequented Cambrian line which has no direct service to key hubs without an interchange at Shrewsbury (with the exception of Birmingham and Birmingham International). Consequently, whilst passengers living in and around the Marches stations have good options for onward travel in most cases (outlined later in this study under sub question 4), passengers living outside the standard station catchment areas will have extended journey times and less accessible means of travelling to their final destination.

From the survey information captured in late 2023, it can be surmised that both markets (passengers from within the catchment area and further afield) are prominent, given the number of

users accessing/leaving the station by private vehicle as well as a similar number accessing/leaving the station by walk/wheel, as shown in figure 19.

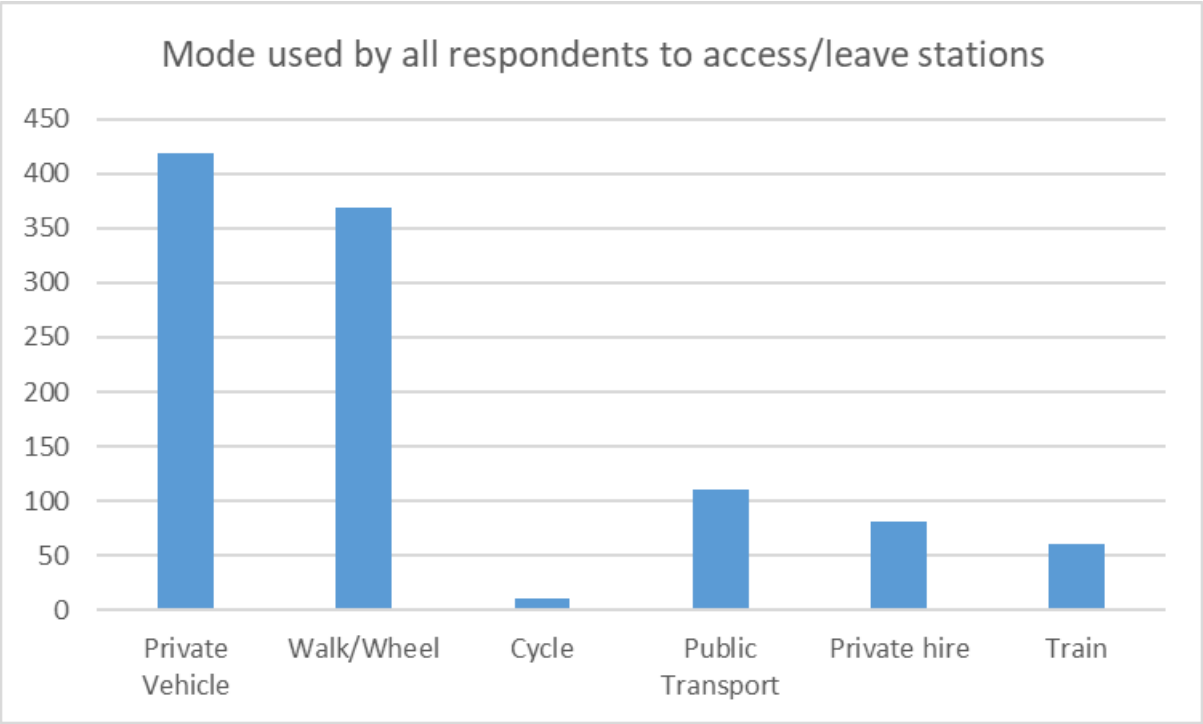


Figure 19 – Survey responses – mode of travel accessing/leaving stations.

What are the amenities along the corridor and how easy is it for demographics to access hospitals and educational hubs etc?

Given the extent of the geography covered by the Marches line infrastructure, there are surprisingly few medical and educational institutions accessible from the railway, in comparison with other geographical areas in South Wales or the Midlands.

Figure 15 demonstrates that a significant portion of travel is undertaken for educational purposes and referring to Figure 16 allows us to visualise that this is the primary travel purpose for passengers travelling to Wrexham General and Hereford, meaning that connectivity to these institutions is crucial.

The tables below outline the closest medical and educational institutions along the Marches line of route, and onward travel times via different modes.

Wales and Borders

Hospital	Closest Station	First/last mile
St Cadoc's Hospital	Newport	Public transport: 33 mins, Walking: 1hr 4 mins, Cycling: 22 mins Car: 14 mins
Royal Gwent Hospital	Newport	Public transport: 15 mins, Walking: 21 mins, Cycling: 8 mins, Car: 7 mins
The Grange University Hospital	Cwmbran	Public transport: 20 mins, Walking: 36 mins, Cycling: 12 mins, Car: 7 mins
County Hospital	Pontypool	Public transport: 19 mins, Walking: 20 mins, Cycling: 8 mins, Car: 6 mins
Nevill Hall Hospital	Abergavenny	Public transport: 26 mins, Walking: 27 mins, Cycling: 9 mins, Car: 8 mins
Hereford County Hospital	Hereford	Public transport: 3 mins, Walking: 8 mins, Cycling: 3 mins cycling, Car: 4 mins
Royal Shrewsbury Hospital	Shrewsbury	Public transport: 14 mins, Walking: 43 mins, Cycling: 16 mins, Car: 9 mins
Leighton Hospital	Crewe	Public transport: 25 mins, Walking: 1hr7 mins, Cycling: 18 mins, Car: 13 mins
Wrexham Maelor Hospital	Wrexham	Public transport: 8 mins, Walking: 14 mins, Cycling: 5 mins, Car: 4 mins
Countess of Chester Hospital	Chester	Public transport: 17 mins, Walking: 34 mins, Cycling: 10 mins, Car: 8 mins

Table 6 – List of closest medical institutions to Marches stations and Google Maps predicted journey times by mode

College/University	Closest station on Marches	First/last mile
University of South Wales	Newport	Public transport: 10 mins, Walking: 10 mins, Cycling: 4 mins, Car: 5 mins
Hereford Sixth Form College	Hereford	Public transport: 12 mins, Walking: 13 mins, Cycling: 6 mins, Car: 4 mins
Westhope College	Craven Arms	Public transport: No options, Walking: 1hr 25 mins, Cycling: 29 mins, Car: 11 mins
Reaseheath College and University Centre	Nantwich	Public transport: No options, Walking: 34 mins, Cycling: 11 mins, Car: 7 mins
Cheshire College South & West	Crewe	Public transport: No options, Walking: 20 mins, Cycling: 6 mins, Car: 10 mins
Derwen College	Gobowen	Public transport: 8 mins, Walking: 21 mins, Cycling: 7 mins, Car: 3 mins

Wales and Borders

Wrexham Glyndwr University	Wrexham	Public transport: 3 mins, Walking: 6 mins, Cycling: 5 mins, Car: 1 min
University of Liverpool	Chester (requires interchange here)	Public transport: 56 mins (12 mins walking), Car: 38 mins
Sixth Form College of Birkenhead	Chester (requires interchange here)	Public transport: train, walking - 1hr 10 mins, Car: 30 mins
The University of Manchester	Crewe (but direct service available to Manchester)	Public transport 56 mins (train then 6 mins walking), Car: 50 mins
Manchester Metropolitan University	Crewe (but direct service available to Manchester Piccadilly)	Public transport: 57 mins (train then 14 mins walking), Car: 49 mins
Cardiff University	Newport (but direct service available to Cardiff)	Public transport: 30 minutes, Car: 26 minutes

Table 7 – List of closest educational institutions and Google Maps predicted journey times by mode

What are housing plans along the corridor and how does this affect rail demand?

Demand growth along the corridor has been determined by national forecasting, coupled with the receipt of housing plans from several of the local authorities along the corridor. Local Plans for many of the council areas within the corridor show a relatively significant amount of both committed and aspirational housing growth throughout the Marches geography, which drives the need for improved connectivity along the corridor. Significant new housing developments are underway at Abergavenny, Wrexham, Shrewsbury and smaller locales north of Shrewsbury at Whitchurch and Wem.

The following analysis compares the exogenous demand growth on stations along the Marches line based on the 'central case' assumption (Department for Transport's assumption based on the Demand Driver Generator), to local housing growth obtained from local authorities planning data. The 'central case' in this scenario is based on the DfT's forecasting methodology, which includes factors included in the Demand Driver Generator (DDG) which is Transport Analysis Guidance (TAG) and Passenger Demand Forecasting Handbook (PDFH) compliant. These factors are as follows:

- GDP
- Employment Growth
- Population Growth
- Car Costs
- Car Journey Time
- Bus Cost
- Bus Journey Time
- Bus Headway
- Underground Cost (not relevant for Marches)
- Air Passengers

The Local Authority Planning assumption is based on the approved local plan dataset provided by each of the local authorities in the study area, however some stations do not have the associated local planning data and have therefore been infilled with the DDG assumption. Furthermore, the data that has been included are those proposals that are either definitively scoped and confirmed or already in progress, rather than aspirational housing. In some cases, as with Chirk, whilst the local authority has housing aspirations for the area, it has been acknowledged that the proposed site is unlikely to be built due to geographical challenges and the site has since been sold elsewhere.

Wales and Borders

As per the following dataset in Figure 20, the local planning data generally assumes a higher growth proportion between 2023 and 2040, with the exception of Hereford, Leominster and Chirk where both local housing forecasts and the DDG are aligned. Housing data was not received for all areas and therefore stations such as Cwmbran, Pontypool & New Inn, Newport and Gobowen show the same level of growth under DDG and DDG + Local Plan columns.

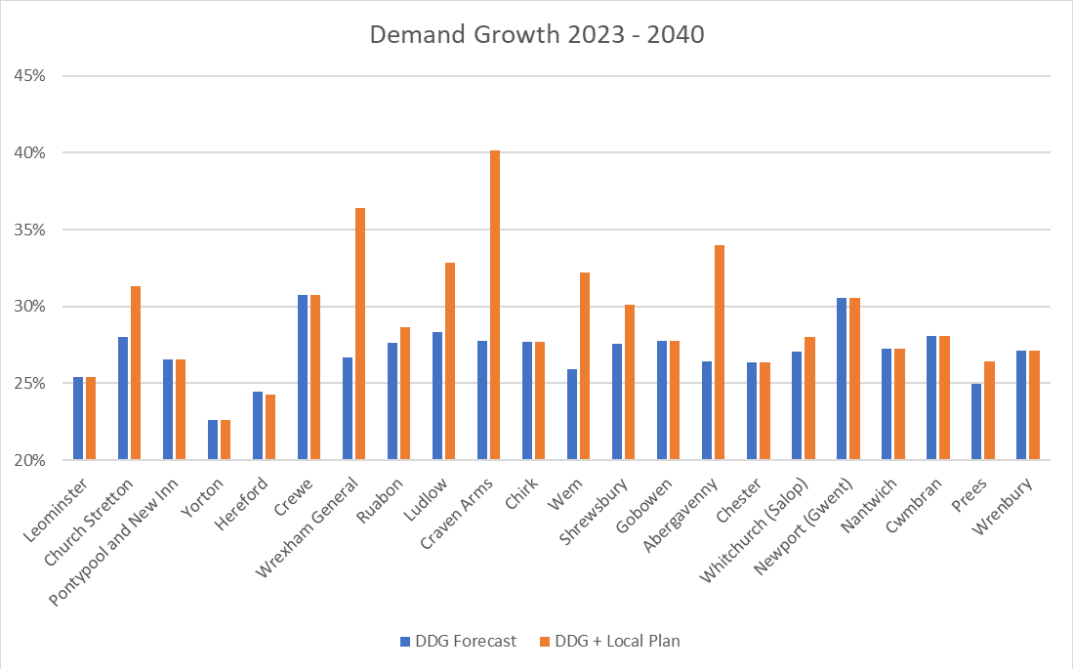


Figure 20 – Demand growth showing DDG forecast and DDG + Local Plan forecast

Smaller locales along the corridor are realising a disproportionate level of growth compared to larger hubs, with Craven Arms seeing the largest forecasted growth at 40%, followed by Wrexham General at 36%, Abergavenny at 34% and Whitchurch at 28%. This is reflected in the work remitted to the Advanced Timetable Team where we have sought to offer consistent stopping services to smaller locales as well as provide a more frequent service to these stations. Connectivity to the station, as well as reliability of train service and consistency will be key in supporting this level of growth. See Appendix 2 for breakdown of percentages at each station.

What opportunity is there to improve first mile/last mile options along the corridor?

Significant work is being undertaken by local representatives along the corridor to provide better connectivity to the stations along the Marches line of route. Local councils at some of the key hubs on the Marches are focused on implementing active travel options that fundamentally improve first/last mile options to the stations.

At Newport, following the recent installation of an active travel footbridge, further proposals are being consulted that would bring in dedicated cycle routes to the station, bring in a new active travel route along the 'Old Green' roundabout that would dramatically improve pedestrianised routes as well as introduce a bus rapid transit proposal that would complement the existing rail service and provide additional connectivity to Gwent hospital.

Similarly, Herefordshire Council have secured funding from the government's Levelling Up fund that is being utilised to progress a transformation of the station forecourt, with expected completion in

Wales and Borders

2025. The reimagining will provide a new multi-modal transport hub that offers green spaces, covered waiting areas and accessible onward connections from the railway station. Herefordshire Council's website has further information.[10]

Shropshire Council have also been making strides to transform railway connectivity, implementing a series of active travel routes around the Shrewsbury station catchment area that links communities in with the station and working closely with Midlands Connect who are themselves the proposers of several key pieces of transformative work that include an Access to Rail programme that seeks to identify lower value early win interventions to make rail travel more accessible and more attractive. Shropshire Council's website has further information.[11]

A new transport hub, proposed as part of the Wrexham Gateway scheme is an encouraging solution that responds to public consultation feedback and the existing poor bus integration in the area. An active travel proposal along Mold Road (which acts as one of the main through-roads for traffic through Wrexham) seeks to compliment this piece of work and offer broader travel options connected to the station. Wrexham Council is working closely with Transport for Wales on these proposals.[12]

What provision could be made for better connectivity to education and medical hubs?

Whilst rail service proposals for the current infrastructure will be considered later within this study, alternative solutions for improved connectivity are also an option for the corridor.

There is a local aspiration by Cambrian Heritage Railways (CHR) to re-establish a rail service on the line between Gobowen and Oswestry. A Strategic Outline Business Case has been produced by CHR under the Restoring Your Railways (RYR) programme, and a key output would be to provide a stop at the former Park Hall Halt to offer connectivity to the Robert Jones and Agnes Hunt Orthopaedic hospital. The connectivity to the hospital from Gobowen station is currently poor for non-car options and sets limitations for those who do not have access to a car or do not wish to drive. The proposal also seeks to respond to the poor connectivity between Gobowen and Oswestry more generally, including the long public transport journey time in comparison with car journey time, as well as long-term decarbonisation aspirations and the desire to move to more sustainable forms of transport in the area. Gobowen has direct access to the line's primary hub (Shrewsbury) and to Wrexham General, with onward travel options to Chester, Hereford and Crewe. Whilst the proposal is not fully funded and is required to demonstrate a positive Benefit Cost Ratio (BCR) as part of the early development work to progress further, this additional route to a nationally significant orthopaedic hospital would be invaluable from a connectivity perspective.

The analysis carried out as part of the contextual work for this study has demonstrated that Mid Wales travel to the Marches is significant, particularly considering the extensive county geography and the fact that constituents are often referred to medical institutions outside the county for specialist services. Powys residents often travel to Shrewsbury and/or Hereford hospitals, and with the rail service in Mid Wales being considerably less frequent than in other Welsh geography, it is important to reflect on other potential travel options. The figures demonstrating that Powys constituents travel to Marches stations for onward travel supports the need to provide better connectivity from Mid Wales to the Marches from an overarching perspective. Whilst a significant

[10] Huge investment planned for county – Herefordshire Council
[11] The Shropshire Plan 2022-2025 | Shropshire Council
[12] Wrexham Gateway Transport Hub | Have your say by Transport for Wales (tfw.wales)

Wales and Borders

increase to the rail service to support this is not likely in the short or medium term, we can look to intermediary options such as park and ride facilities to support that lacking connectivity. A park and ride facility to support a/some stations between (and/or including) Shrewsbury and Hereford would offer provision of connectivity to the hospitals as well as onward travel on the railway as both Shrewsbury and Hereford hospitals are accessible by sustainable forms of travel from the stations. A significant portion of survey respondents confirmed that they used private cars to access and leave the stations on the Marches line: Craven Arms shows that over 50% of railway users access the station by car, with Leominster showing just under 50%. An option that presents the opportunity to reduce car travel and replace with a sustainable transport mode would contribute to reducing carbon emissions, particularly if Electric Vehicle (EV) charging spaces were made available at the park and ride facility. One or multiple park and ride facilities in this area would also likely support the student market around Hereford, where commuting for education is the highest journey purpose and Hereford college is situated a short walk away from the station.

Furthermore, a Newport Council bus rapid transit proposal seeks to provide a new connection to The Grange hospital in Cwmbran; the service is proposed to start at Newport bus station (a six-minute walk from Newport train station) and continue to Caerleon and then to the hospital. The provision of this service is key to enhancing the longer-distance options out of Newport and offers a secondary option to travellers if onward travel to Cwmbran on the railway line is difficult. The long-term aspiration, currently post- public consultation, is to bring more of these services into the station area with the transformation of the front end of the station to provide additional bus stops in the place of the existing taxi hub.

Transport for Wales's commitment to the reformation of buses through franchising is also crucial in this space, playing an instrumental role with aspirations to improve bus integration at stations and key destinations along the corridor.

Summary of state of play and where the gaps are based on increased demand.

Reflecting on the detailed economic analysis carried out as part of this study, as well as the survey outputs from late 2023; it is evident that the Marches line continues to be heavily frequented, albeit with a passenger behavioural change likely brought on by the COVID-19 pandemic and the consequential cultural shift throughout the United Kingdom.

In order to best support its markets, the data captured as part of the economic analysis as well as the live passenger feedback suggests that the railway industry should be considering:

- A consistent timetable that does not focus on peak times in the pre-covid traditional sense.
- A more frequent service for smaller stations along the corridor such as Leominster and Whitchurch, allowing for housing growth and post-covid recovery usage.
- Better connectivity to educational hubs in Wrexham and Hereford to better support the student market.
- Better connectivity options for the rural markets outside the traditional station catchment areas.
- Improved all-around passenger experience, benefitting all markets but to encourage repeat usage for the primary leisure market.
- Increased capacity on train to allow for anticipated future growth in the local areas, currently being responded to by the new fleet introduction.

Wales and Borders

SQ 2a) How can we make best use of the existing Marches infrastructure?

What does capacity on passenger services currently look like?

The Marches has a consistent level of demand across the corridor, which is shown in sub-question one by the key flows and passenger travel movements along the corridor. This is reflected in the capacity heatmaps collated by the Network Rail economic analysis team which imply that there is ordinarily a decent level of spare capacity on Marches services, potentially owing to the variety of travel patterns carried out by passengers post-covid. The following example looks at the 'traditional' peak hours between 7am and 9am departing from Hereford, where the expectation would be that a decent proportion of commuters and leisure passengers would be travelling. Vehicle allocations are based on MOIRA 2 modelling, calibrated to TfW 2022 counts data where available, which was based on class 175 and 158 rolling stocks and a three-car formation. Future projections (2030 and 2040 are based on Class 197 fleet). It is important to note that Transport for Wales's fleet introduction programme will have realised changes during the transition period between older and newer rolling stock.

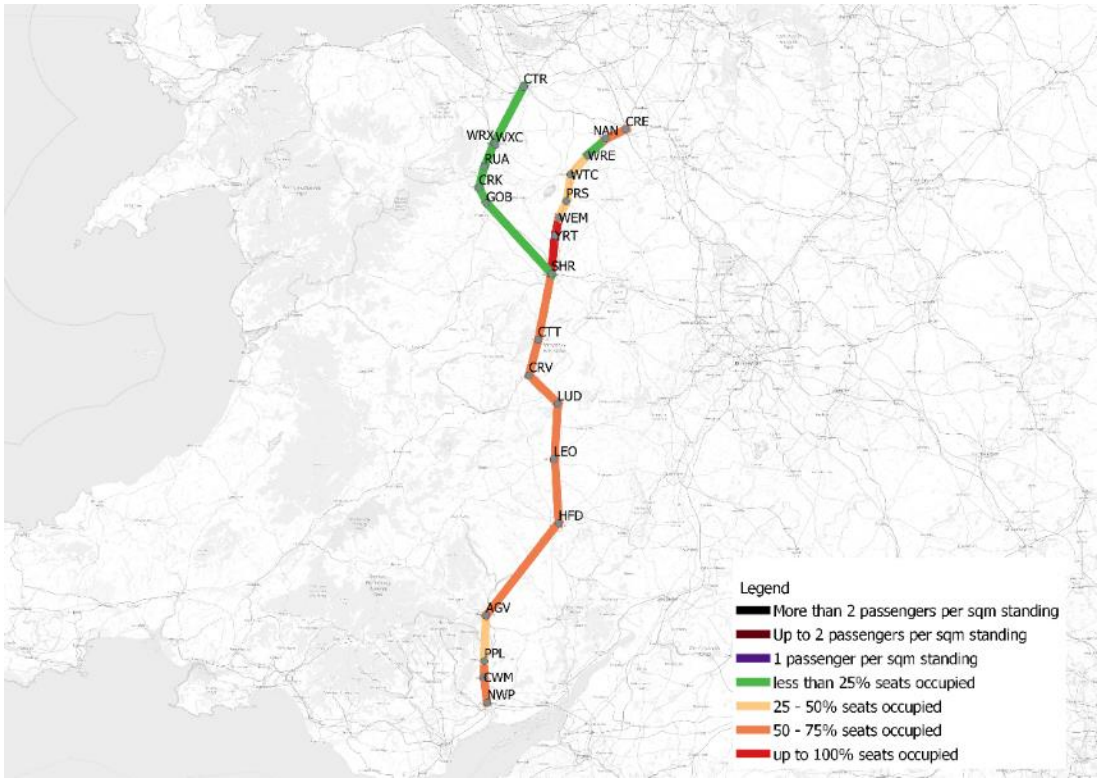


Figure 21 – Capacity levels based on 2022 TfW counts data, on historic rolling stock (7am – 9am)

Whilst the railway between Shrewsbury and Wem is at capacity based on current data, there appears to be sufficient seating available across the rest of the corridor, particularly between Shrewsbury and Chester. If we look at the projections for 2030, specific stretches are likely to be at 100% seated capacity such as between Shrewsbury and Wem, however, there remains a healthy amount of seating available on the remaining stretches of the route for services during this time with the projections set to the new class 197 rolling stock. These projections are based on the Demand Driver Generator data, the DfT's central growth assumption released in April 2023.

Wales and Borders

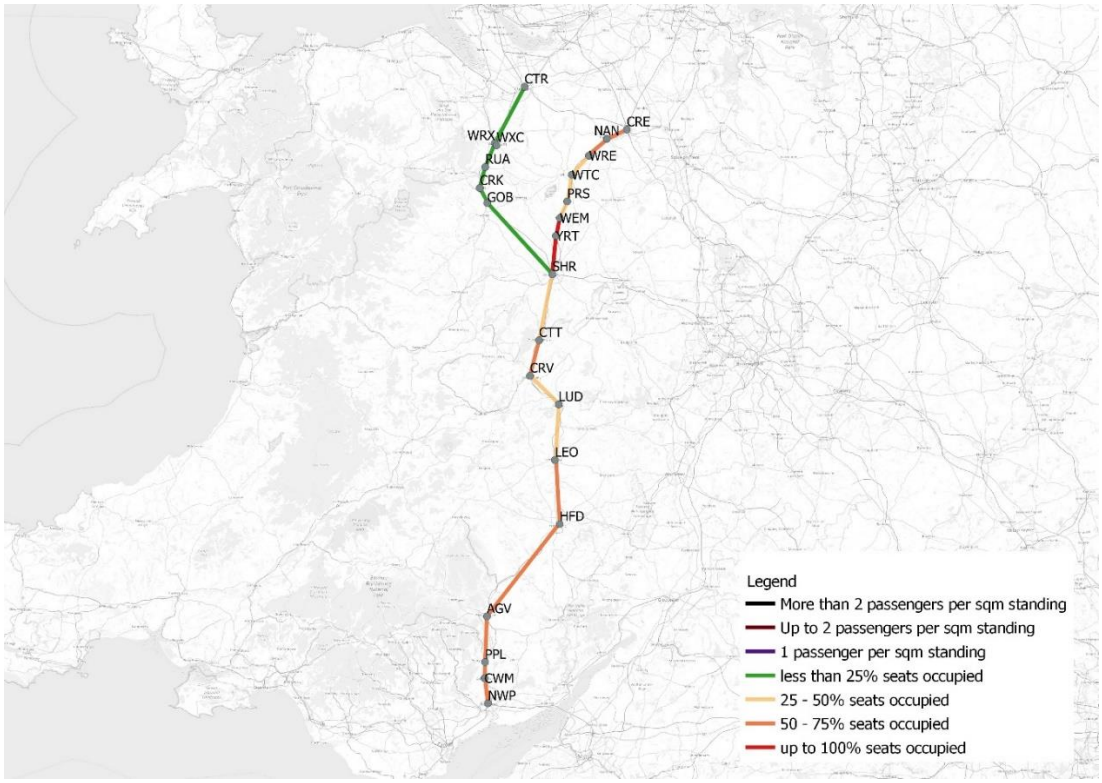


Figure 22 – Capacity level projections for 2030, based on the DfT's Demand Driver Generator (7am – 9am)

Projections for 2040 suggest that the corridor would be at capacity in some areas, with the Shrewsbury to Wrexham stretch still offering ample seating. The Shrewsbury to Wem section at this time would however see passengers standing.

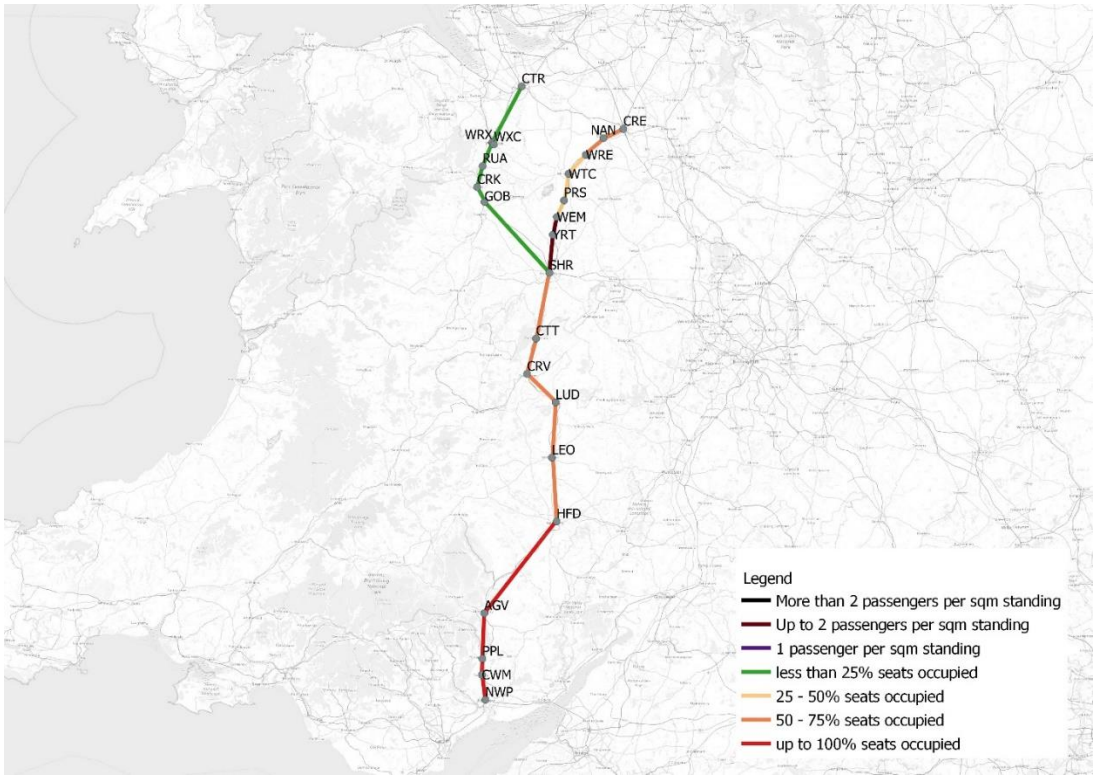


Figure 23 – Capacity level projections for 2040, based on the DfT's Demand Driver Generator (7am – 9am)

Wales and Borders

The nature of the Marches corridor is such that whilst this data is accurate for the majority of services, there are specific services that see significant crowding.

Observed passenger capacity between Shrewsbury and Chester can differ from the MOIRA and TOC data with some trains observed as being at close to capacity; this could relate to specific services or occur during specific times of higher leisure journeys. However, there should certainly be a closer analysis of on-train capacity on this section, specifically if any of the recommendations are taken forward.

On another section of the route, further analysis of the 0750 Cardiff – Manchester service which is known to be well-frequented (often due to student travel or a combination of commuter, business, and leisure travel); demonstrates that the capacity is not always sufficient on board. In this case, the following outputs were shown:

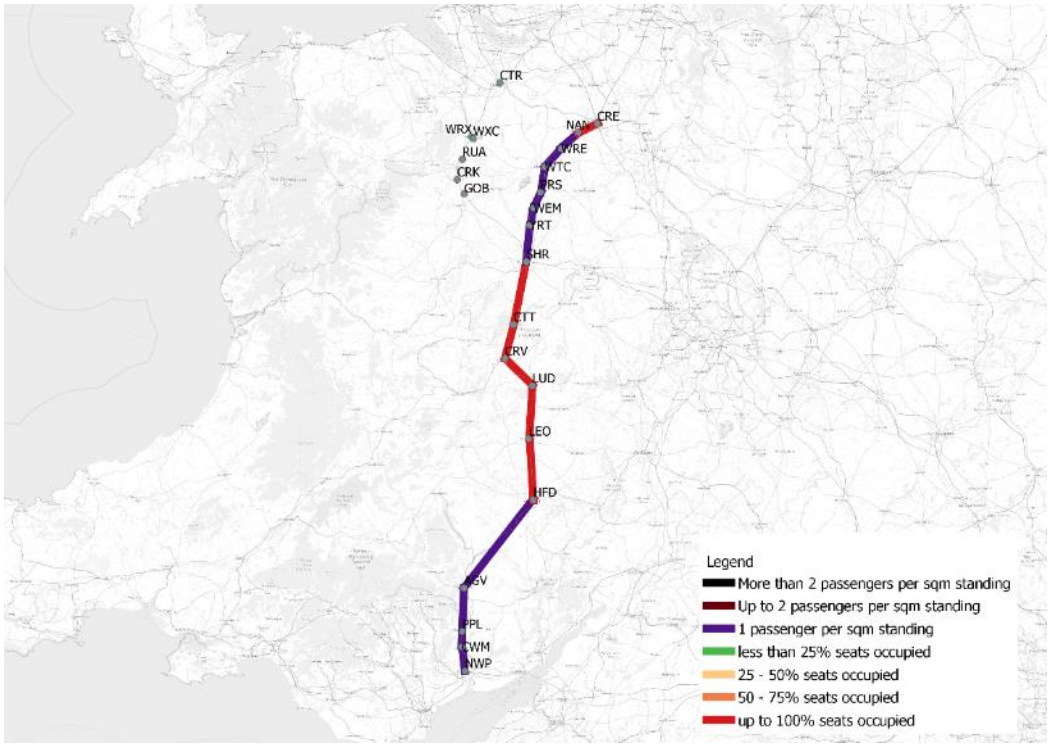


Figure 24 – 0750 Cardiff – Manchester service – current capacity

This heatmap demonstrates that passengers are already standing on stretches of the corridor on this service and seating is otherwise at full capacity. If we look at projections for 2030 and 2040 below and use the class 197 fleet for these projections, we can see that the fleet transition has alleviated some of the crowding, but the service is still subject to overcrowding on certain stretches.

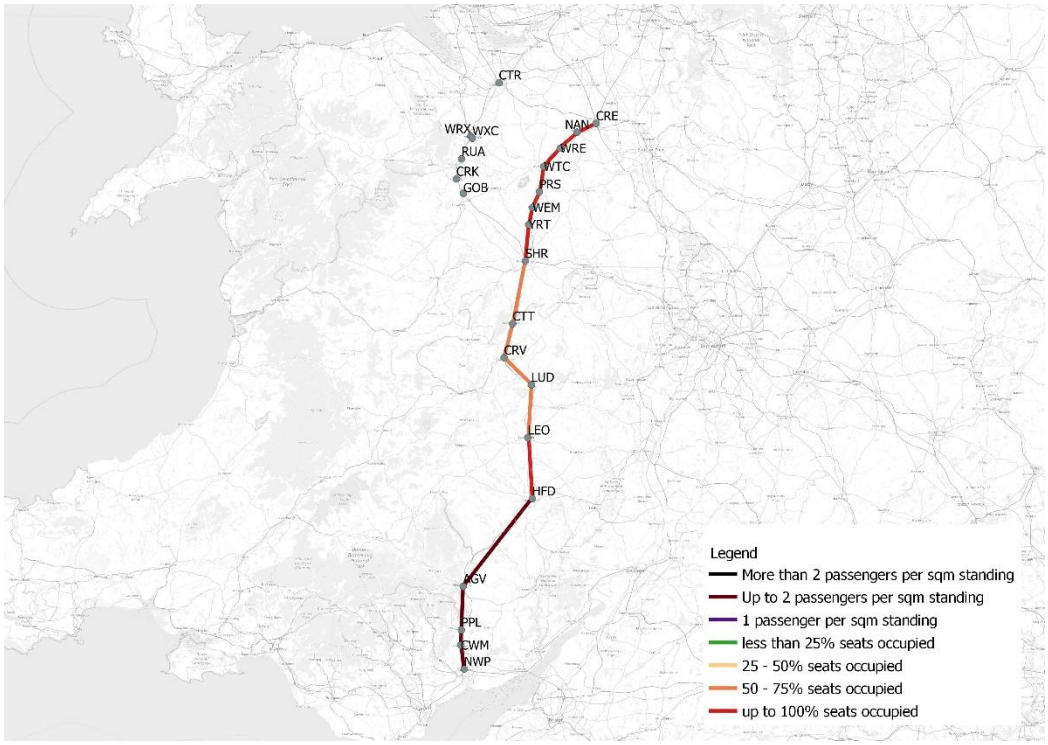


Figure 25 – 0750 Cardiff – Manchester – 2030 projection

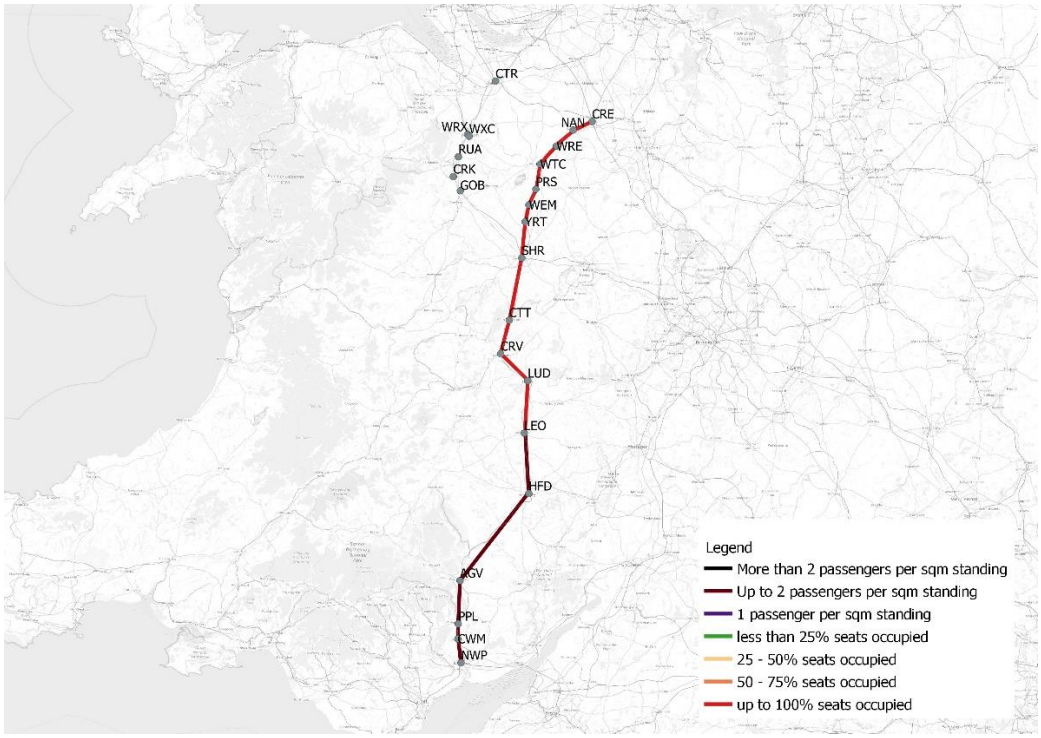


Figure 26 – 0750 Cardiff – Manchester service – 2040 projection

Wales and Borders

Are there any opportunities to improve capacity without significant infrastructure change?

Transport for Wales has commenced an extensive fleet replacement programme that will be instrumental in improving capacity and passenger experience on the Marches line. The hourly South Wales to Manchester service will be operated by a mix of class 197 diesel units and Mark 4 / class 67 locos and coaches. By the end of 2024, it is aimed that the Mark 4s will run every two hours with class 197s operating alternate hours. All Mark 4 trains are now 5-car, having been recently extended from 4-cars. These vehicles are TfW's premier fleet offering a full coach of comfortable First Class, a kitchen offering full dining to First Class passengers and hot snacks to Standard Class, and comfortable standard class seating with many bays of four seats around tables. The class 197 services are all planned to be 5-car between Manchester and Swansea and will include Standard premium seating. Furthermore, the two-hourly Cardiff to Holyhead services will be operated by 3-car class 197s, generally units with Standard Premium seating, and the Birmingham – Holyhead services will receive 2-car 197 units. The current forecasted implementation of these changes is scheduled for the December 2024 timetable. This will trigger a significant step-change in capacity and service quality compared to the previous and existing fleet currently in transition, which consists of primarily 2- and 3-car diesel units. The specifications that are enhancements compared with the historic fleets are outlined below:

Mark IV

- All trains fixed 5-car formation – 250 standard class seats and 40 First class seats.
- 2 wheelchair spaces in standard class and 1 in First Class
- Comfortable long-distance layout with end doors, many seats around tables and plenty of luggage space
- Good ride quality and loco-hauled configuration means no noise from underfloor engines.
- Service vehicle with kitchen service full at-seat dining in First Class and hot snacks from buffet counter for standard class
- 6 bicycle spaces
- Full air-conditioning
- Modern passenger information screens
- At-seat power and wi-fi
- 110 mph top speed

Class 197

- Manchester services will be 5-car between Swansea and Manchester with 291 standard class and 16 Standard Premium seats.
- Holyhead services will be generally 3-car with 168 standard class and 16 standard premium seats.
- Three multi-use areas in 5-car train and two in 3-car train, each accommodating two bicycles.
- Four wheelchair spaces in 5-car trains and two in a 3-car train
- At-seat trolley service
- Fully air conditioned
- Modern passenger information screens
- At-seat power and wi-fi
- 100 mph top speed

Wales and Borders

Capacity constraints along the corridor could also be addressed by segregation of the long- and short-distance markets by splitting existing passengers onto the services separately targeting the different markets. It is prevalent that the Marches seeks to respond to conflicting markets and the introduction of a service that would respond directly to those Cardiff-bound commuters and leisure travellers in the South Wales area would likely transfer some passenger footfall from busier long-distance services. The Network Rail Advanced Timetable Team (ATT) have explored the introduction of an additional 1tph (trains per hour) service to and from Abergavenny (validated from Newport) that seeks to respond to this in the short-term. It was established that this service could be inserted into the existing December 2023 timetable with no requirement for infrastructure change (based on a 10am – 4pm time window). Further proposed changes will be outlined later in this sub-question.

Are there are any further improvements that could be made without significant infrastructure change or new investment?

Network Rail has unlocked funding for a programme that removes the current Permanent Speed Restrictions (PSR) for loco-hauled units (Mark IV rolling stock hauled by class 67s) on the Marches line. These changes were carried out on the Shrewsbury – Crewe line (SYC) in Week 2 of 2024/2025 and planned for Week 14 on the Shrewsbury – Hereford line (SHL). This will enable loco-hauled services to travel at the same linespeed as multiple units (MUs). A summary of the linespeed increases is set out in Appendix 3.

It is expected that these changes will enact a 2–4-minute journey time saving on the SYC and a 4–6-minute saving on the SHL. These small journey time improvements will allow some additional flexibility for those loco-hauled services on the line in meeting their on-time performance.

Significant work to target specific unit headcodes showing a pattern of delays has been undertaken by the Wales & Borders route performance team to respond to sub-threshold delay (a delay under three minutes) on the Marches line. For the seventh consecutive period (as of June 2024), there has been a continued reduction in this category, in part attributable to the improvement offered by the removal of the PSRs on the line which likely fall into this area.

Are there future Network Rail renewals plans on the Marches that will play a role in readying the infrastructure for future enhancement?

Network Rail renewals are planned by control period and are subject to review and possible change due to infrastructure factors. Network Rail track renewals are in place for CP7, undertaken on a like for like basis in modern equivalent form. Whilst there are consistent and ongoing renewals planned throughout CP7 on Marches assets from the strengthening of underbridges and track renewals to canopy refurbishment and rock cutting refurbishment, these are preventative and are not enhancements to the infrastructure. CP8 renewals onwards are not yet planned in any detail.

Network Rail does have long-term aspirations for the re-signalling of this geography (Newport – Shrewsbury, Shrewsbury – Crewe and Shrewsbury to Dee Marsh), however these are not currently scheduled under any particular control period by our signalling asset management team. The European Train Control System (ETCS) Long Term Deployment Plan, which is itself undergoing a national review, does envision the respective projects in the following timescales:

- Shrewsbury – Crewe – late CP10 (2039 – 2044)
- Shrewsbury – Chester – late CP11 (2044 – 2049)
- Newport – Shrewsbury – late CP12 (2049 – 2054)

Wales and Borders

These dates are subject to change and are not set in stone. Notably, any reconfiguration of Shrewsbury station signalling to improve traffic flow will need to look at the Shrewsbury to Chester project area as this is the area that includes Shrewsbury's signal boxes.

Any potential transformation that would address the ageing signalling system would likely respond to frequency issues on the line and support long-term additional service aspirations.

Furthermore, Network Rail's level crossing workbank has several Marches-based crossings programmed for renewals in CP7. Some of these crossing interventions are not required to deliver the proposed service enhancements outlined later in this study, such as Bromfield, Marshbrook, Gobowen North and Moreton on Lugg. The extent of these renewals is not yet known and therefore could be minor life-expiry works under a minimum viable product approach. Notably, there are three level crossings planned for CP7 on the corridor that would require intervention to facilitate the proposed service enhancements (a full list is set out under sub-question 2b). The crossings are Ashbrook (SHL), Cronkinsons Farm (SYC) and Cronkinsons Footpath (SYC). These dates are subject to change.

How are targeted performance measures making improvements on the corridor?

In May 2024, Wales & Borders Route initiated the Wales Route Timetable Taskforce with the aim of significantly reducing subthreshold delay within the Working Timetable (WTT) with the targeted goal of highly accurate December 2025 WTT. The Taskforce utilises a joint industry approach with our Train Operating Company stakeholders across our Route and backed with strong data analysis from the System Operator function within Network Rail. The analysis will make recommendations to core timetabling processes, not limited to amendments to Sectional Running Times (SRTs), station dwell times and other Timetable Planning Rules (TPRs).

The Marches has been identified as a key line-of-route for the Taskforce to commence undertakings, with initial analysis having been provided for optioneering and eventual ratification through our Taskforce stakeholders.

Further work is also being commissioned through the Rail Safety & Standard Board (RSSB) in line with the Rail Technical Strategy to review all Freight SRT throughout Wales & Borders Route, supporting efforts to increase freight growth through improvements to running times and identification of increased trailing load opportunities.

The work being carried out by this Taskforce has already and will continue to respond to the sub-par performance on the route and build a more reliable forthcoming timetable. If this work were to continue as a standard review process for any timetable change, we could expect a more consistent performance outlook over the decades to come.

How are we responding to weather resilience considerations for the future?

Network Rail is also undertaking extensive work across the Wales and Borders route to fund an adaptation pathways workstream which seeks to proactively identify locations requiring intervention to provide a weather-resilient network. In Control Period Seven (CP7 2024-2029), Network Rail's principle focus will aim to mitigate the impact of climate change, either operationally or in protecting the asset to reduce the impact on passengers and freight users. The CP7 plans include interventions that should enable Network Rail to minimise and mitigate the impact of extreme weather and climate change on the network and through schemes that will improve the environmental sustainability of the business.

Wales and Borders

In Control Period Six (CP6 2019-2024), a scheme was undertaken adjacent to the River Monnow near Abergavenny on the Marches. The location has been an issue for generations, with the railway typically closing for at least seven days following extreme weather events. The water overtopping the railway causes scour to the track, track bed and embankment, leaving the track hanging in mid-air. Following on from the success of a rock armour scheme in the Conwy Valley where the protection afforded has reduced the asset recovery time from four months to two days, Network Rail investigated its effectiveness on the site at River Monnow, concluding it would provide similar levels of protection. This solution now provides protection to the railway embankment for a 1 in 200-year event, plus 70% climate change projection. Although the railway will close during the most extreme weather events (demanded by remote condition monitoring which monitors the water level in the watercourse and floodplain and is triggered by a water level which poses a risk to the asset and the passage of trains), the railway can now reopen quickly, with minimal intervention. Pictured below is pre- and post-intervention.

This same principle is being applied in CP7 to Llangua, a location which sits a few miles towards Hereford on the same river. This area is historically similar to the River Monnow scheme and Network Rail's internal design and delivery team is currently developing the scheme. The adaptation pathways workstream will allow the Network Rail to proactively identify further locations similar to these sites in the future and develop a long-term strategy that will seek to make priority recommendations for future investment across the Wales and Borders route.

What are the current freight flows and what does path utilisation look like?

Freight activity on the Marches has lessened over the last decade, with decarbonisation initiatives from the West of England removing diesel traffic and frequent flows being less utilised.

Current regular flows (as of May 2024) along the corridor include:

- Timber being transported from Baglan/Aberystwyth (three round trips) and Carlisle (five round trips) to Chirk.
- Cement being transported from Padeswood to Avonmouth (currently – destination may change long term), usually three times a week as a return journey.

- Aggregate from Moreton-on-Lugg or Port Talbot steelworks can either run via the Severn Tunnel or via Shrewsbury to Bedfordshire, usually four times a week as a return journey (but no certainty of which route is used).
- Timber being transported from Carlisle to Chirk (via Chester), usually three times a week and often return via Shrewsbury – Crewe line, usually five times a week.
- Steel traffic from Margam and Llanwern to Shotton steel works (Dee Marsh Junction), usually five times a week as a return journey.
- Loaded aggregate from Coton Hill to the East Midlands or north of England, usually twice a week as a return journey but not via the Marches (except for the short stretch to Shrewsbury station).

The Marches is utilised often on a short-term planning basis, with Penyffordd (Padeswood) cement flows often diverted along the southern end of the corridor at weekends. There is also sporadic traffic from the Ministry of Defence between Bicester or Kineton and Donnington that is transported via Crewe – Shrewsbury. The Marches is also a key diversionary route for many freight flows, with intermittent usage particularly during engineering works.

There is ample potential for an increase in traffic on the route given decarbonisation aspirations by Tata Steel at Port Talbot who want scrap metal to be brought in by train for use in arc furnaces in place of the current blast furnaces. Contingency should also be retained to provide for potential increases in the movement of green fuels and product from Heidelberg's Padeswood/Penyffordd cement plant.

Less than 50% of the freight paths available are utilised during an average weekday on the Marches, with more utilisation versus availability on the weekends. Regular current usage is predominantly via traffic from Freightliner, DB Cargo, GB Railfreight and Colas. Future traffic growth has sufficient headroom based on these figures. It is vital to allow these paths for growth due to the nature of freight services along this corridor and the need to secure the paths in any timetable work. As freight is utilised by private businesses, freight services will only run when required. The importance of freight (as highlighted elsewhere in the report) means we cannot prohibit the ability to run services if agreed in the timetable.

Can we identify any new freight flow opportunities for the future?

With a UK Government freight growth target of 75% tonne-kilometres by 2050, it is imperative that future opportunities are brought to light for potential future development, and whilst the Marches is less frequented by freight traffic than in previous years, it remains a strategic geography within the UK for a variety of material flows as well as a diversionary route.

There is significant discussion around Bayston Hill (Shrewsbury) and the potential for a new connection at this location. The projection is for a minimum of two freight trains per day out of the site, which would provide justification for the cost of installing a new connection south of Shrewsbury, which would be required to facilitate the proposed new freight flows. The site is the largest Tarmac quarry without a rail connection in the UK, and therefore a north-facing connection would provide the connectivity required to enable a transformative proposal for freight along the Marches.

As mentioned above projections for increased traffic are also possible as a result of Tata Steel's desire for arc furnaces at Port Talbot to replace blast furnaces. Significant levels of scrap materials

will be required to match existing steel production and with post-consumer material providing a key feed for scrap, there is scope for large quantities to come from cities throughout Britain. Consequently, there is opportunity for new freight flows from the Midlands and north of England to use the Marches corridor for transportation of scrap metal to Port Talbot.

Whilst other new freight proposals are tenuous along the corridor, there are further opportunities that could readily transpire in the long-term. The former Deeside Titanium sidings have attracted interest from a nearby vehicle manufacturer that would require freight flows between Wrexham and Shrewsbury at the very least. A re-opening of the Glascoed branch has even been mooted as a future possibility, with the Bae (Systems) – whose facility is located at the end of the branch – showing recent interest.

Severn Bridge Junction Signal Box

Wales and Borders

2b) How can infrastructure changes support future service aspirations for the line?

What are the various stakeholder aspirations for the Marches line?

Network Rail has consulted a significant number of stakeholders for the purpose of informing this study and acknowledge their input with gratitude. There are numerous aspirations for the Marches, encompassing additional services, journey time improvements, connectivity to major hubs and capacity.

An initial stakeholder forum was held on the 28th of February 2023 for the purpose of collating stakeholder views on short-, medium- and long-term aspirations for the corridor. Representatives from other Network Rail routes, Train Operating Companies (TOC), Freight Operating Companies (FOC), local authorities, passenger groups and transport bodies were present and able to share their thoughts at this forum or in further correspondence following the meeting.

Stakeholders shared a mutual interest in ensuring the Marches has sufficient capacity for passengers, lamenting the overcrowding on services and the on-board passenger experience on an ageing rolling stock fleet that does not encourage repeat custom from irregular travellers; a market that is invaluable given the Marches' position as a significant leisure travel corridor. Several stakeholders stated additional capacity as a priority for their organisation, with longer trains and better-quality rolling stock desired.

Connectivity was widely discussed, with emphasis on providing onward connectivity from stations as well as better links to key hubs outside the Marches such as Liverpool and Cardiff and improved connectivity from Chester to Wrexham. The significance of connectivity for education was raised on numerous occasions, with the capacity constraints featuring heavily in criticism.

A desire to segregate the markets on the Marches was also prevalent in conversations, with stakeholders agreeing that faster journey times to Manchester was a priority and the option for shorter distance stopper services would be welcomed to serve those differing markets. There was a particular mention of a long-held ambition for a shuttle service to Abergavenny to capture the South Wales commuter and leisure markets north of Cardiff.

As well as the aspirations outlined above, the over-arching messaging from key stakeholders was to improve reliability and punctuality along the corridor, which would better serve all passengers and create a more efficient railway.

A number of these aspirations are reflected in the feedback obtained via the surveys carried out on the corridor in November 2023. When posed the question, "what would encourage you to travel by rail more frequently?" passengers responded as outlined in Figure 27 below, with cheaper travel, better reliability and more seats being the priority for most respondents.

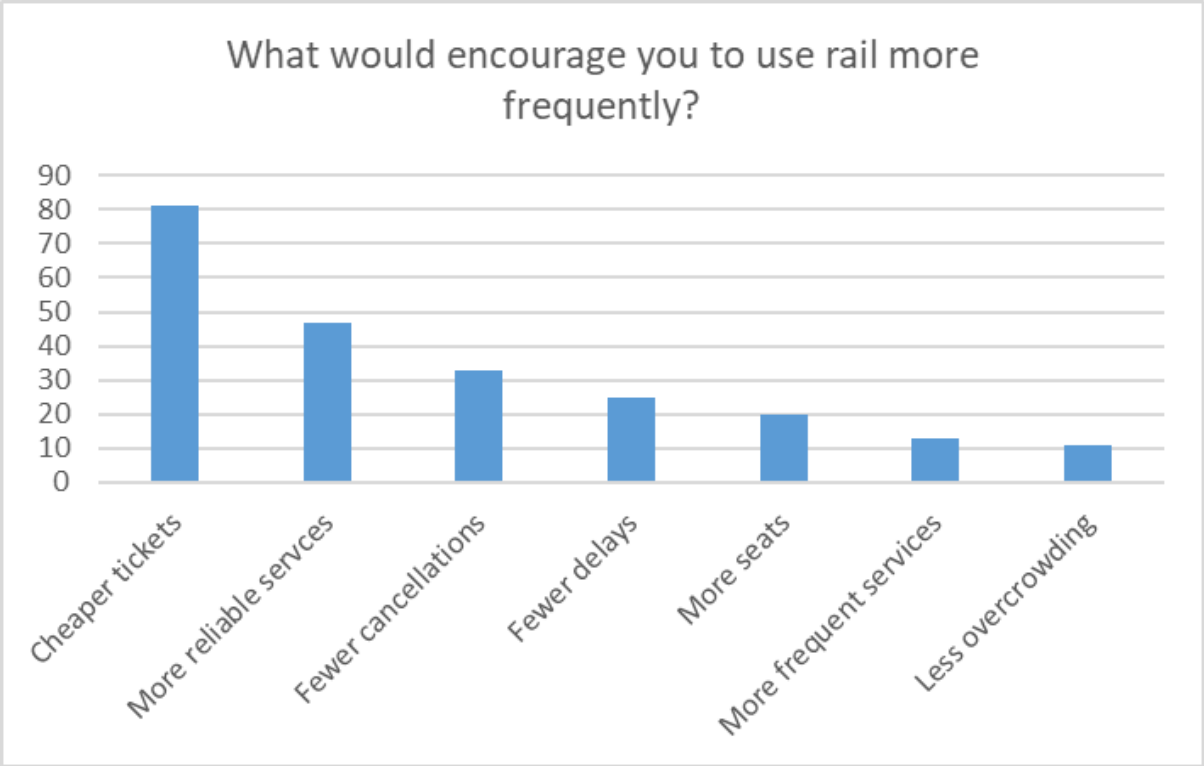


Figure 27 – Survey responses – what would encourage passengers to use rail more frequently?

Whilst freight operators presented no formal aspirations for additional services along the corridor, it was acknowledged that maintaining a consistent freight service is crucial to enable ample opportunity for short-term planning and diversionary movements. Stakeholders acknowledged that the lack of flexibility offered by mechanical signalling, no bi-directional working, and an absence of sufficiently long loops along the corridor makes for a difficult cooperation of freight and passenger services, with freight running significantly slower than passenger services.

What does an enhanced service look like and how could this be achieved?

Extensive conversations with stakeholders and passengers, as well as detailed economic analysis outputs have informed a five-phase series of indicative train service specifications (ITSS) that look at potential service changes and enhancements across the corridor over the coming decades. The ITSS phases are based on a six-hour window between 10am and 4pm to ensure that the full scope of train services on the Marches line is captured. As such, whilst the proposal is for these six-hour windows to be reflected over the course of a full day, any timings outside this window have not been validated. The analysis seeks to demonstrate whether, and to what extent, the different stakeholder aspirations for services along the Marches line can be accommodated within the existing infrastructure. It then highlights what infrastructure enhancements might be required if it is not possible to satisfy all aspirations within the existing infrastructure capability. Each ITSS phase builds on the previous ITSS phase. There are several critical assumptions that should be observed as part of this work:

1) As the boundaries of this study, platforming at Crewe and Chester has not been validated. An existing piece of work to understand capacity constraints at both stations is being carried out by Network Rail colleagues in Northwest and Central region. Once the work has concluded, further development of any proposal set out in this study will need to consider the proposals set out in that strategic advice. Similarly, capacity on the South Wales Main Line has also not been assessed for services heading west towards Cardiff from Newport.

Wales and Borders

2) All schedules presented from ITSS 1.5 – 5 have assumed a class 197 unit is operating the service (for ease of analysis). This is due to this fleet being the primary fleet proposed for this route.
3) A summary of level crossing impact is carried out post-ITSS 5 commentary and assumes that the level crossings listed, and therefore the infrastructure changes required, are applicable as of ITSS 3 onward due to the increase in train numbers.
4) ITSS 2 onwards assumes that Cardiff Parkway proposed new station is included in the schedules, due to the commitment at the time this ITSS phase was developed. It must be noted that Cardiff Parkway is currently 'paused.'
5) These ITSS options are phases and as such, each phase builds on the last. The services within subsequent ITSS options have not been explored in isolation from the previous ITSS options i.e., the Cardiff – Manchester services have been assessed to understand intervention requirements ***on top of*** the Cardiff – Liverpool services and not in isolation.

The proposed phases are as follows:

ITSS1	Baseline (December 2023 timetable)
ITSS1.5	Reduced journey time for Cardiff – Manchester service without infrastructure enhancements or timetable enhancements
ITSS2	*New timetable option (previously worked through between NR and TfW) used as 'baseline' from ITSS 2 onward. The main difference between December 2023 baseline and the new timetable option is the Liverpool service set out below.* 1tph Shrewsbury – Liverpool Lime Street (extended to Cardiff Central every two hours) Existing (December 2023) freight services All day consistent 2 tph Birmingham – Shrewsbury service
ITSS3	All enhancements in ITSS2 Cardiff – Manchester service to call only at Newport, Hereford, Shrewsbury, Crewe, Wilmslow & Stockport 1 tph to call at the removed stations from the above Cardiff Manchester Services.
ITSS4	All enhancements in ITSS3 Hourly Class 6 freight path in each direction Existing 1 tph Crewe – Chester service extended to/from Wrexham General Additional 1 tph (Birmingham) – Worcester – Hereford calling at all stations between Worcester & Hereford Additional 0.5 tph Shrewsbury – Crewe service calling at all stations to give a regular 1 tph stopping service
ITSS5	All enhancements in ITSS4 Journey time of 2.5 hours for Cardiff – Manchester service 1 tph (Euston) – Birmingham – Shrewsbury 1 tph Crewe – Chester – Wrexham in ITSS4 extended to/from Shrewsbury 1 tph (Leeds) – Manchester – Chester extended to/from Wrexham General

Table 8 – Indicative train service specification proposals

Wales and Borders

ITSS1: Baseline

The 'baseline' used as a starting point is the December 2023 timetable, which is also used for ITSS 1.5. This includes the following services across the lines:

Northbound	
Milford Haven – Manchester Piccadilly	0.5tph
Cardiff Central – Manchester Piccadilly	0.5tph (alternate hours to Milford Haven)
Cardiff Central – Holyhead	0.5tph
Birmingham – Holyhead	0.5tph (alternative hours to Cardiff)
Shrewsbury – Crewe	0.5tph
Swansea – Shrewsbury	Every 3-4 hours
Southbound	
Manchester Piccadilly – Carmarthen	0.5tph
Manchester Piccadilly – Cardiff Central	0.5tph (alternate hours to Carmarthen)
Holyhead – Cardiff Central	0.5tph
Holyhead – Birmingham	0.5tph (alternate hours to Cardiff)
Crewe – Shrewsbury	0.5tph
Shrewsbury – Swansea	Every 3-4 hours

Table 9 – Breakdown of December 2023 baseline services

Services into Hereford and Shrewsbury which are within the geographical extent of this remit are as follows:

Birmingham New Street – Hereford	1tph
Birmingham New Street – Shrewsbury	1tph

Freight paths currently exist approximately once an hour, however these paths are not consistent within each hour across the day.

From ITSS 2 onward, a new baseline timetable is used with the main difference being the addition of the Liverpool service on the Marches line.

Wales and Borders

ITSS 1.5

- Removal of stops from the Cardiff – Manchester service to reduce journey time.

Note: all Transport for Wales (TfW) schedules from ITSS 1.5 onwards have been amended to 197 stock to reflect the best possible journey time (on the basis of the rolling stock transition). It should be noted that 50% of the TfW Manchester services are served by Class 67 and Mark IV sets which have slower acceleration and longer dwell times.

Responds to:
Stakeholder aspiration for faster journey times to Manchester

An exploratory piece of work was initially conducted to understand the viability of improving journey times from Cardiff – Manchester against the current baseline. This was referred to as ITSS 1.5 as it did not fully explore any mitigating measures for removing station stops from the existing service pattern. The exercise was undertaken to fundamentally understand whether the speeding up of these services is possible without any infrastructure change, timetable enhancements or impact on other services.

In order to carry out the analysis for ITSS 1.5, the existing schedules were changed to a 197 traction instead of 158s/67+MK4 (for ease of analysis) and all stops besides Cardiff Central, Newport, Hereford, Shrewsbury, and Crewe were removed from the journeys between Cardiff Central and Crewe to enable the largest possible journey time improvements as planned for in ITSS 3.

In the Manchester Piccadilly to Cardiff Central direction, the largest reduction in journey time was 18 minutes (1V38DB 09:30 – 12:32 was 12:50). Two other schedules achieved a reduction of 15.5 minutes (1V40DB 11:30 – 14:27 was 14:42:30) and 15 minutes (1V42DC 12:30 – 15:27 was 15:42) respectively. These reductions were achievable due to a lack of conflicting freight paths or the ability to adjust them accordingly. Additionally, available gaps were available onto the SWML (South Wales Main Line) into Newport and onward into Cardiff Central. Other services had no or little journey time improvements. The following table gives an example of the schedules where a journey time reduction was possible with a change in fleet and then a change in stopping pattern. The Dec23 197* column has not been validated but seeks to show the possible journey time reduction in the event of the proposed calling stops being removed.

	Dec23 175		Dec23 197*		197 fewer stops	
Location	Arr	Dep	Arr	Dep	Ar	Dep
Crewe	10:07:00	10:10:00	10:07:00	10:10:00	10:07:00	10:10:00
Shrewsbury	10:38:30	10:40:30	10:38:30	10:40:30	10:38:30	10:40:30
Cardiff Central	12:50:00	12:56:00	12:44:30	12:50:30	12:32:00	12:35:30

Table 10 – Manchester – Cardiff journey times by fleet and stopping pattern

In the Cardiff Central to Manchester Piccadilly direction, the largest reduction in journey time was 19.5 minutes (1W16DB 10:12:30 was 09:53 – 13:11). All other services had little to no journey time improvement due to the conflicting freight paths and the difficulty of finding a clear path between Cardiff and Newport. The following table gives an example of the schedules where a journey time reduction was possible with a change in fleet and then a change in stopping pattern. The Dec23 197* column has not been validated but seeks to show the possible journey time reduction in the event of the proposed calling stops being removed.

Wales and Borders

	Dec23 175		Dec23 197*		197 fewer stops	
Location	Arr	Dep	Arr	Dep	Ar	Dep
Cardiff Central	09:48:00	09:53:00	09:51:00	09:56:00	10:07:30	10:12:30
Shrewsbury	11:51:00	11:53:00	11:51:30	11:53:30	11:53:00	11:55:00
Crewe	12:28:00	12:30:00	12:28:00	12:30:00	12:28:00	12:30:00

Table 11 – Cardiff – Manchester by fleet and stopping pattern

Any further journey time improvements that would enable a change in all schedules would likely require infrastructure changes, explored in later ITSS phases. No accommodation has been made for the removal of stops at intermediary stations and as such the economic analysis concludes that a solution of this nature would be in no way recommended.

Wales and Borders

ITSS 2

- New timetable 'baseline' used from ITSS 2 onwards.
- 1tph Shrewsbury – Liverpool Lime Street (extended to Cardiff Central every two hours)
- Existing (December 2023) freight services – to ensure that all freight is applicable.
- All day consistent 2tph Birmingham – Shrewsbury service

Responds to:

- Economic analysis evidence demonstrating that Liverpool is a key hub for passengers using the Marches (3rd most served external destination).
- Stakeholder aspiration for direct connectivity to Liverpool.
- The need for more frequent service along the corridor, responding to stakeholder aspiration as well as local housing development growth and key flows evidence.
- The need to ensure retention of freight paths to allow for medium-term growth.

All existing December 2023 freight services were added into the ITSS timetable successfully; however, most were moved imperceptibly into paths that are scheduled within the proposed ITSS 2 patterns. One freight service was moved earlier by 1 hour and 57 minutes due to lack of available space alongside the newly included Cardiff – Liverpool services. The number of paths available to freight within the remit boundaries and timeframe remain the same.

All proposed West Midlands Trains Shrewsbury – Birmingham International schedules within the remit timeframe were added successfully, with a consistent arrival (xx55/xx35) or departure time (xx10/xx50) at Shrewsbury. These schedules have not been validated enroute to/from Birmingham as this is outside the scope of the remit.

The Cardiff – Liverpool services have ongoing challenges, which were previously identified as part of the original analysis during ITSS 2 development. In the first instance, the increase in services between Shrewsbury and Wrexham increases the risk to level crossing users to an unacceptable degree at Weston Rhyn, Viaduct Footpath and Moreton Hall 1 Footpath level crossings, to the extent that enhancements to these crossings would be required in mitigation. This was identified as part of the Gobowen scheme development work undertaken in 2022. Furthermore, the core infrastructure change triggered as part of the introduction of these services will require the installation of new bi-directional Intermediate Signals south of Ruabon. This is required to split the existing 18-minute headway (not consistently 18 minutes due to the absolute block infrastructure) north of Gobowen into two broadly 9-minute sections that will enable the increase in services and reflect the headways currently seen between Gobowen and Shrewsbury. The specific infrastructure required would be two Intermediate Block Signals (IBS) and two accompanying distant signals.

Wales and Borders

ITSS 3

- All enhancements in ITSS 2 included.
- Cardiff – Manchester journey time improvements; these services to call at Newport, Hereford, Shrewsbury, and Crewe only (within the extent of the Marches – later stops will include Wilmslow and Stockport).
- Additional 1tph between Cardiff and Shrewsbury calling at all stations to provide consistent calls at intermediary stations and restore level of service.

Responds to:

- Stakeholder aspiration for journey time betterment to Manchester.
- The need to focus on long-distance and short-distance markets independently to respond to capacity issues, reliability and key flow evidence.
- Economic analysis demonstrating that leisure is the primary market, with faster journey times for passengers travelling to tourism locations internal and external to the corridor.
- The need for consistency at intermediary stations along the route on stopping services.

The Cardiff Central – Manchester Piccadilly services, when stopping at the specified stations only, can consistently run twenty minutes faster in the Northbound direction (validated for the four schedules fully within the remit timeframe of 10am-4pm). The total journey time between Cardiff Central and Manchester – Piccadilly would therefore operate sub-three hours at 2hrs and 58 minutes total. In the Southbound direction, the results were less consistent for the four schedules, with 18.5 minutes, 16 minutes, 17.5 minutes, and 14 minutes savings respectively. The new journey times are captured below in table 12:

Manchester Piccadilly - Cardiff Central				
	Improvement (mins)	Man Pic	Cardiff Cen	Journey Times
1V38	18.5	09:30	12:24	02:54
1V39	16	10:30	13:28	02:58
1V40	17.5	11:30	14:25	02:55
1V42	14	12:30	15:29	02:59
Cardiff Central - Manchester Piccadilly				
	Improvement (mins)	Cardiff Cen	Man Pic	Journey Times
1W12	20	10:13	13:11	02:58
1W56	20	11:13	14:11	02:58
1W14	20	12:13	15:11	02:58
1W60	20	13:13	16:11	02:58

Table 12 – Journey time improvement by headcode

There are however immediate challenges with this proposed phase which seeks to segregate the long- and short-distance markets on the route. Due to the nature of the signalling on the Marches corridor, the capacity utilisation between Cardiff and Shrewsbury is already nearing its full capability. The introduction of the Cardiff – Liverpool services in ITSS 2 results in the additional changes within this ITSS triggering a capacity utilisation exceeding 100% at certain locations along the corridor.

In the Northbound direction, the all-stations services are not compatible with the existing freight paths due to the long block sections, specifically between Pontrilas – Tram Inn – Hereford.

Wales and Borders

Additionally, within the timeframe of the remit, an existing freight unit (shown in Appendix 4 as 6M62QJ) cannot traverse the Panteg to Pontrilas section before it is caught by the following accelerated Manchester service. The train graph in Appendix 4a depicts the occupation of each signal block between Maindee North Junction and Hereford as a shaded triangle, representing the time each block is occupied for based on the ITSS proposals (Northbound). For services to run without delay, these blocks cannot overlap.

These challenges are also exacerbated by the significant gradient between Abergavenny and Pontrilas as freight services take longer to clear the signal section before another service can follow. The blue freight paths in the graph portray this clearly.

The Southbound direction has similar constraints, with the long block sections and overall speed differentials between freight and passenger units triggering an exceedance of the capacity utilisation along the corridor.

As well as the same constraints within the Hereford – Tram Inn and Abergavenny – Little Mill Junction sections, the Southbound direction also shows an exceedance of capacity utilisation between Pontrilas and Abergavenny, where the corresponding IBS that exists in the Northbound direction does not exist in the Southbound. Freight services take up to 15 minutes to traverse the Pontrilas – Abergavenny section, while passenger services take nine minutes, with a two-minute allowance for the signallers to reset the signals before the next unit arrives. This is visualised by the train graph in Appendix 4b.

In addition to the capacity constraints for the additional services; in retaining the existing number of freight paths, the hours in which heavier freight units (2200 tonnes) are travelling, the Cardiff – Manchester services would suffer a journey time delay. This will reduce the overall betterment by eight minutes and result in the services running in those hours improving by 12 minutes total, instead of the previously identified 20 minutes for other hours. Two out of the six services within the timeframe sped-up schedules within this remit's timeframe would be impacted.

A further stipulation of this proposal is that the additional stopping services in the Southbound direction between Shrewsbury and Cardiff have inconsistent departure times. This is a result of train arrival patterns at Shrewsbury where arrival and departure times for existing services are inconsistent, forcing the proposed stoppers into platform 5. The need to use platform 5 stems from the inability to dwell in platform 4 and being unable to shunt toward Abbey Foregate from platform 4. The proposed Southbound services would be times as follows:

Headcode	Origin	Work Dep	Destination	Work Arr
1C08CD	Shrewsbury	09:14:00	Cardiff Central	11:10:00
1C09CD	Shrewsbury	09:51:00	Cardiff Central	12:09:00
1C10CD	Shrewsbury	11:02:00	Cardiff Central	13:07:00
1C11CD	Shrewsbury	12:14:00	Cardiff Central	14:22:00
1C12CD	Shrewsbury	13:04:00	Cardiff Central	15:14:00
1C13CD	Shrewsbury	14:15:00	Cardiff Central	16:15:00
1C14CD	Shrewsbury	15:05:00	Cardiff Central	17:15:00

Table 13 – Summary of southbound department times, Shrewsbury – Cardiff Central

Wales and Borders

In order to successfully run the full ITSS 3 proposals within the remitted timeframe, further extensive infrastructure changes would be required. Additional IBS would be required between Tram Inn and Hereford and between Little Mill Junction and Abergavenny in the Northbound direction. Two corroborating distance signals would be required for these two IBS. In the Southbound direction, two IBS would be required within the same block sections, as well as an additional IBS between Abergavenny and Pontrilas; a total of three additional IBS southbound, which would require three corroborating distance signals. A total of five additional IBS and five distance signals would therefore be required to facilitate the enhancements set out in this ITSS phase.

Further infrastructure intervention is likely due to level crossings risk; the affected crossings are set out below (after the 'Summary of Interventions' on page 60) as they have been assessed based on a holistic view of the entire five-phase ITSS and would need to be considered for ITSS onward.

Wales and Borders

ITSS 4

- All enhancements up to and including ITSS 3 included.
- An hourly Class 6 freight path in each direction.
- The existing 1tph Crewe – Chester service extended to/from Wrexham.
- Additional 1tph Birmingham – Hereford.
- Additional 0.5tph Shrewsbury – Crewe stopping service, providing a regular 1tph service.

Responds to:

- Stakeholder aspirations for increased service into Hereford and economic analysis showing Hereford as a key hub along the corridor.
- Stakeholder aspiration for direct provision between North Wales and borderland hubs such as Chester and Crewe.
- The need for better provision at smaller locales to respond to post-covid growth and local housing development growth.
- The need to allow for long-term growth of freight paths, responding to freight growth targets and potential future increased traffic.
- Aligning with strategic work being undertaken in North West & Central region.
- Projected capacity constraints on the Shrewsbury – Crewe corridor.

The challenges with this ITSS phase stem from the increase in freight paths alongside the passenger enhancements set out in earlier ITSS phases. In the first instance, an hourly freight service in each direction is only feasible if freight haulage weights are constrained to 800 tonnes: an unrealistic expectation for freight operation on the Marches. The difference in journey time through block sections between the lighter freight units at 800 tonnes and heavier freight units at 1400 tonnes is a significant four minutes between Abergavenny and Abergavenny Sig.38 (for example). 1600T and 2200T freight units are significantly longer. Whilst the addition of loops would benefit 1400T units, this would still require retiming of other services and take up multiple slots, thereby negating the possibility of an hourly freight path. The existence of loops does not offer any improvement for the heavier freight units in this scenario. The fundamental issue with this level of proposed freight and passenger service in conjunction is the long block sections. The infrastructure interventions proposed in ITSS 3 would contribute to enabling this service proposal, however an additional Intermediate Block Signal will also be required between Marshbrook and Dorrington with an accompanying distance signal (both Northbound and Southbound). Furthermore, the 2200T freight units would require double heading to achieve the pathing for the hourly freight service; requiring two locomotives at the front to enable faster journey time. As outlined in the ITSS 3 commentary, in 2200T unit hours, the proposed Cardiff – Manchester journey time would be increased by eight minutes.

For the proposed extension of the Crewe – Chester shuttle to Wrexham, the proposal can be achieved with some trade-off options. In order to accommodate these services without importing performance risk, the existing services would need to depart at xx37 rather than the existing xx21. This is to ensure a sufficient turnaround time at Crewe, provide a clear run into Chester Platform 3 and onto Wrexham General past the single line between Rosset Junction and Wrexham North. Furthermore, the headway requirements between Crewe, Chester and Saltney junction have inconsistent timings, partly due to the absolute block section between Crewe Steel Works and

Wales and Borders

Beeston Castle & Tarporley Signal Box. This means there is little flexibility to be able to retime services or run faster, which would prevent the requirement for four of the seven schedules within the timeframe to import additional pathing time approaching Rossett Junction. The overall additional journey time for these four schedules would be four minutes. The proposed 'Routes to Chester' strategic advice currently underway in the Northwest and Central Network Rail region consider options that look at the extension of the existing Transport for Wales service but equally considers a new Crewe – Wrexham service. Either of these formats is palatable from a connectivity perspective and further development will be required once the advice is completed in order to understand the preferred option and the subsequent proposed pathing. An additional service may have greater flexibility around timing.

The additional Birmingham – Hereford 1tph could be accommodated at Platform 1 at Hereford, provided that turnback could be undertaken within a five-minute turnaround time. This enhancement requires infrastructure intervention outside the boundaries of this study and will need to be developed and understood in a supporting piece of work, however we can confirm that Hereford station is able to accommodate this enhancement from a capacity perspective.

The final enhancement proposed in ITSS 4 was the addition of 0.5tph Shrewsbury – Crewe. This was successfully converted to a 1tph service. There is however no additional time in these schedules, and they currently have a nine-minute turnaround only, meaning that any delay could have a significant knock-on effect. This is primarily due to the limited platforming opportunities at Shrewsbury, with platform seven only being available for these services. The proposed service between 12:21 and 13:12 also conflicts with an existing Holyhead – Cardiff Central service and would require timing if this enhancement were to proceed without intervention. The proposed reconfiguration of Shrewsbury platform 3, which would offer Up and Down access into the platform, would negate the need for this retiming. Further analysis of existing unit 5P55NG would also be required as this service conflicts with the proposed additional service at Crewe station.

Wales and Borders

ITSS 5

- All enhancements in ITSS 4 included.
- A Cardiff – Manchester journey time of 2.5 hours
- 1tph Euston – Birmingham – Shrewsbury
- 1tph Crewe – Chester – Wrexham in ITSS 4 extended to/from Shrewsbury
- Leeds – Manchester – Chester service extended to Wrexham

Responds to:

- Stakeholder aspiration for connectivity to London as well as responding to external key flows evidence and Shrewsbury as the primary hub on the corridor. This also responds to a Shrewsbury – Euston service being recently removed.
- Stakeholder aspiration for journey time betterment to Manchester.
- Economic analysis evidence demonstrating that Shrewsbury is a key hub, linking additional services from the north.
- Stakeholder aspiration for connectivity between North Wales and other northern hubs.
- Local housing development growth around Wrexham and the surrounding areas.

In order to meet a journey time specification of two and a half hours between Cardiff and Manchester, a wholescale intervention of the infrastructure would be required. It is not possible to meet this journey time with the current infrastructure and this would likely require additional tracks along the line between Cardiff and Shrewsbury to allow faster trains to pass slower ones, as well as permission to run at higher speeds along the full length of route. The fastest journey time identified within this study is 2 hours and 54 minutes; this has an additional five minutes in the schedule to allow for compliance with other trains on the network.

The proposed additional service between Euston and Shrewsbury, alongside an extension of the Crewe – Wrexham service (in ITSS 4) to Shrewsbury would not be possible simultaneously with the station at Shrewsbury configured as it currently is. The services would also trigger a requirement to retime the existing Cardiff – Holyhead services, as well as the Cardiff – Manchester services as all four services would be required to use platform 4. If the proposed reconfiguration of platform 3 were to proceed, allowing access from northbound and southbound directions, the two enhancements proposed under this ITSS, (the Crewe – Wrexham extension and the Euston - Shrewsbury service) would be able to platform share in platform 4 – using 4B for trains from the West and 4A for trains from the East), and the long-distance services would be able to utilise platform 3 in its new configuration.

The final service enhancement proposed is the 1tph Leeds – Chester service extended to/from Wrexham General. It would not be possible to extend this service, primarily due to the extension proposed in ITSS 4 of the existing Crewe service to Wrexham. The Leeds service currently utilises platform 6 (a bay platform) at Chester and would be required to use an alternative platform to allow onward access to Wrexham General. Platforms 3, 4 and 7, which would allow onward access, are in constant use throughout the day, and where a gap is attainable, the single line between Wrexham and Rosset Junction would prevent this service from progressing. If the existing Crewe – Chester service were not extended to Wrexham in ITSS 4, the Leeds – Chester service would be able use the paths used by the Crewe – Chester proposed enhancement. However, it is likely that the Leeds

Wales and Borders

service would need to be retimed on this basis; an added complexity that would require further development outside the scope of this study, alongside the review of capacity options at Chester which is being carried out by strategic planning in North West & Central region. Furthermore, if the Leeds service were to be extended (in place of the Crewe – Chester shuttle extension), the service to Wrexham and from Wrexham would conflict with one another within the single line section. Further retiming of the service to Wrexham (or the service from Wrexham) would therefore be required to fully realise this service.

Since the completion of this work, there has been an Open Access request for additional paths into Shrewsbury, which would also trigger the requirement for intervention at Shrewsbury that would provide a suitable reconfiguration for greater traffic numbers.

Summary of interventions

The table below provides an overview of the infrastructure requirements triggered by each additional service. As specified above, the services build on one another as a package of enhancements and therefore an infrastructure requirement is likely triggered by the sum of a service plus previous enhancements and not necessarily a service as a standalone entity.

	Signalling interventions between Shrewsbury and Wrexham (WSJ2)	Signalling interventions between Newport and Hereford (HNL1)	Shrewsbury Platform 3 re-configuration	Signalling interventions between Hereford and Shrewsbury (SHL)	Redoubling between Wrexham General and Rosset Junction	Non-infrastructure consequence
Existing Dec 2023 freight services – ITSS 2						
Cardiff/Shrewsbury – Liverpool (1tph – Cardiff 0.5tph) – ITSS 2	✓					
Birmingham – Shrewsbury (2tph total) – ITSS 2						
Cardiff – Manchester fast service (1tph) with Cardiff – Shrewsbury stopper service (1tph)* - ITSS 3		✓				✓ *Slower journey times in heavy load freight traffic hours*
Hourly freight path in each direction – ITSS 4		✓		✓		✓ *Slower journey times for CAR-MAN services in 2200T hours*
Existing Crewe – Chester extended to/from Wrexham General (1tph) – ITSS 4						✓ *Retiming of departure from Crewe Four minutes additional journey time for some trains*

Wales and Borders

Birmingham – Hereford (additional 1tph) – ITSS 4						
0.5 tph Shrewsbury – Crewe stopper (1tph total) – ITSS 4			✓			
Euston – Shrewsbury (1tph) – ITSS 5			✓			
Crewe – Chester – Wrexham (as extended in ITSS 4) extended to Shrewsbury (1tph) – ITSS 5			✓			
Leeds – Manchester – Chester extended to/from Wrexham (1tph) – ITSS 5					✓ **	✓ *Would require retiming*

Table 14 – Summary of interventions

*These services would not be run in isolation/proposed individually and are therefore grouped – there would be a possibility of providing a more consistent stopper service at intermediate stations on the existing Manchester-Cardiff path if this was not proposed to be sped up/if a journey-time increase was acceptable

**This service could take the paths of the Crewe – Chester extension proposed in ITSS 4 if redoubling were not possible; however, both services cannot run in conjunction

What is the impact on level crossings, and would any further infrastructure works be required to facilitate the proposed service enhancements?

Consultation has been undertaken with the regional Level Crossing Project Manager to understand the impact these proposed enhancements would have on the level crossings on the route.

There are 220 level crossings in total across the geography within the scope of this remit; the team has modelled the risk change on the top risk level crossings on the corridor, as well as any additional crossings flagged by local level crossing manager expertise. An intervention is normally triggered at locations where there is a 20% or more increase in risk, as well as at those locations where there is a change in risk score triggered. The findings set out as part of this study outline the mitigations that would need to be strongly considered for any of the uplifts proposed. This work has so far been undertaken for crossings within Wales & Borders route only. Further work is required to engage with the North West & Central level crossings team to understand the impact on the north end of the WSJ2 and the WDB1 to Chester.

The service enhancements set out in ITSS 2 (Cardiff – Liverpool) have been subject to further development as part of an existing project and as such, there is a definitive list of level crossings that require intervention for this phase. The full list of crossings outlined hereafter would therefore need to be considered for ITSS 3 onward as the majority of crossings were deemed safe as reasonably practicable for ITSS 2, with the exception of Ashbrook and Weston Rhyn.

Whilst the table below provides a snapshot of an initial overview assessment, it is important to note that the risk at any given level crossing is constantly changing and other influences may trigger a

change in risk prior to the development (or certainly the delivery) of any long-term enhancement. This may in turn effect any of the proposed mitigations captured below as well as any number of other level crossings that currently sit outside the top risk level crossings for the route. Workshops would need to be carried out with all level crossing managers for this geography to discuss the proposed uplifts and agree the mitigations and this would require the use of a full timetable to identify heavy usage points in detail.

Any proposed additional service would require a full assessment of all level crossings on the proposed route, carried out formally and funded as part of the proposed project. This piece of work is indicative only.

Key

MSL - Miniature stop lights
OMSL – overlay miniature stop lights
SRM – Standing red man
VAS – Vehicular activated signage
RLSE – Red light safety equipment
MCBOD – Controlled Barriers with Obstacle Detectors
FPWM – Footpath with Wicket gates and Miniature Warning Lights
FPGM - Footpath with Bridleway gates and Miniature Warning Lights
COVECT – Supplementary audible warning device – plays the sound of a train horn at the crossing; must be used alongside whistle boards – will be product expired in 2025 and may need to be removed; Network Rail is awaiting advice on the situation with this

Wales and Borders

Crossing	Mitigation required	Is it planned? (Subject to change)	Indicative cost (starting from) (Subject To Change)
Ashbrook (SHL)	MSL Flex (Required for all uplifts mentioned)	Planned for CP7	£850,000
Leominster (SHL)	MCBOD (Would need a full assessment - Technical authority participated in previous workshop in relation to increased capacity)	No	£4m
Cronkinsons Farm (SYC)	MSL (Required for all uplifts mentioned)	Planned for CP7 – ongoing issues may prevent delivery in CP7	£350,000
Cronkinsons Footpath (SYC)	MSL (Required for all uplifts mentioned)	Planned for CP7 – ongoing issues may prevent delivery in CP7	£350,000
Weston Rhyn (WSJ2)	MCBOD (Required for any of the uplifts provided – capacity is deemed to have been reached with another 8 trains which ITSS 2 would exceed)	No	£4m
Leaton (WSJ2)	MCBOD or other smaller mitigations	No	£4m
Woodlands (SHL)	Diversionary route created over land and closure	No	Not known
Baschurch (WSJ2)	MCBOD or other less costly mitigations - barrier extension etc	No	£4m
Wellington (SHL)	MCBOD or other less costly mitigations - barrier extension etc	No	£4m
Tilley Green (SYC)	MSL - currently reliant on WB	No	£350,000
Dorrington Grove (SHL)	Depending on COVTEC license issue may require MSL	No	£350,000
Wem (SYC)	Explore pedestrian footbridge to eliminate Misuse with increase in barrier down time	No	£4m
Offas Dyke (HNL1)	MSL	No	£350,000
Old Mill (SHL)	MSL - close to buildings will require a lot of consideration regarding noise and light - likely a more expensive product required	No	£350,000
Wrenbury (SYC)	Look at lower cost options RLSE, SRM, VAS	No	£300,000

Table 15 – Summary of level crossings impacted by proposed service enhancements in Wales & Borders route

For the area of the WSJ2 north of Wrexham General proceeding into Chester, North West & Central region has carried out a similar exercise to understand the increase in risk on the level crossings on this stretch of line.

The significance of the increase is partly due to the crossings being relatively low risk in their current state due to having an active warning of a train approach installed, however it is noted that the train frequency increase is significant on this line of route.

The region's Route Level Crossing Manager would expect the project to investigate closure of crossings to address the increase in risk, should the proposals be further developed.

Wales and Borders

Crossing Name	Crossing Type	ITSS2 Risk Increase	ITSS3 Risk Increase	ITSS4 Risk Increase	ITSS5 Risk Increase
Balderton	MCBOD	62%	62%	129%	129%
Belgrave	FPWM	184%	184%	304%	304%
Broad Oak	MCBOD	62%	62%	129%	129%
Green Lane	MCBOD	62%	62%	129%	129%
Oldfields Farm	FPWM	185%	185%	305%	305%
Pulford	MCBOD	62%	62%	129%	129%
Rossett	FPGM	130%	130%	227%	227%

Table 16 – Summary of level crossings impacted by proposed service enhancements in North West & Central route

Economic analysis of ITSS phases

The following analysis compares the ITSS phases against the criteria set out in this study. The criteria were developed based on the objectives of the study, including understanding how we can make best use of the infrastructure to achieve revenue and welfare benefits (taking consideration of trade-offs), improving connectivity for key journeys within the Marches and encouraging mode shift to rail.

The methodology is set out in the Appendix 5.

The outputs of the economic analysis are detailed below in a variety of visuals, which highlights the difference in qualitative vs quantitative benefits of any enhancement on this line of route.

There are a series of overarching assumptions to consider prior to review of this information, which are set out below:

- The Appraisal is based on a 60-year period (DfT standard for long-life assets).
- The first year of benefits (the opening year of the scheme) is 2025.
- The benefits are realised 100% in the first year (2025).
- The price base year presented is in 2010 prices.
- The discount rate used is 3.5% for 30 years from the current year, 3.0% for the next 45 years and 2.5% thereafter.
- Timetables are provided by the Advanced Timetable Team.
- Some disbenefits may be inherited from the ITSS 2 timetable, which is used as the proposed 'baseline' timetable from ITSS 2 onward. This is due to the commitments at the time of this ITSS development.

The first table represents the socio-economic benefits of each individual ITSS phase, set out by local connectivity improvements for passengers, increases in rail mode share and freight benefits. This output assumes:

- The flows included in this analysis are limited to intra-Marches flows for the benefits realised in this table.
- The connectivity improvements are represented by 'value of time' savings, which is modelled using MOIRA 2 modelling package.

Wales and Borders

- The mode shift benefits are estimated by comparing the change in passenger miles (created by bringing new passengers onto the railway) against the baseline timetable.
- The freight benefits are measured by the environmental benefits created by a projected number of road freight vehicles no longer using the road (and assuming that the freight is instead transported by rail).
- The figures set out in the table are indicative and are there to give an idea of the level of benefits that could be realised by each ITSS phase. They are not prescriptive, nor should they be used as a 'target figure.' These figures serve primarily to demonstrate the difference in levels of improvements realised by each phase.
- The performance impact of the enhanced ITSS phases has not been assessed at this stage, e.g., Schedule 8 has not been included as part of this economic analysis output.

Criteria	Metric	ITSS 1.5	ITSS 2	ITSS 3	ITSS 4	ITSS 5
Improve Local Connectivity	Value of Time (VoT) Saving per annum for key flows (£000, per annum)	-334	646	658	715	973
Increase rail mode share	Passenger miles change (000s per annum)	-3,413	12,041	11,705	14,532	39,096
Freight Benefits	Change in Marginal External Costs (MEC) benefits (£000 per annum)	-	-	- 67,259	93,557	93,557

13

Table 17 – Socio-economic benefits of each ITSS phase

Each ITSS phase, with the exception of ITSS 1.5, provides significant social benefits across the value of time saving (for key flows), rail mode share increase and freight categories. These proposals fundamentally address the social elements set out within this study, in reaching for a greener and more efficient railway. ITSS 3 shows a negative output for freight benefits; this is due to the measure being the expectation of removing freight from road to rail and this phase required the removal of two freight opportunity paths (strategic capacity). Whilst these are currently not allocated to a particular freight operator, the reduction in available paths is not palatable and we have proposed to remedy this as part of ITSS 4. However, these two paths (currently available to run on eight occasions throughout a week), could potentially be accommodated outside the scope of the remit timeframes (10am – 4pm). This would need to be investigated.

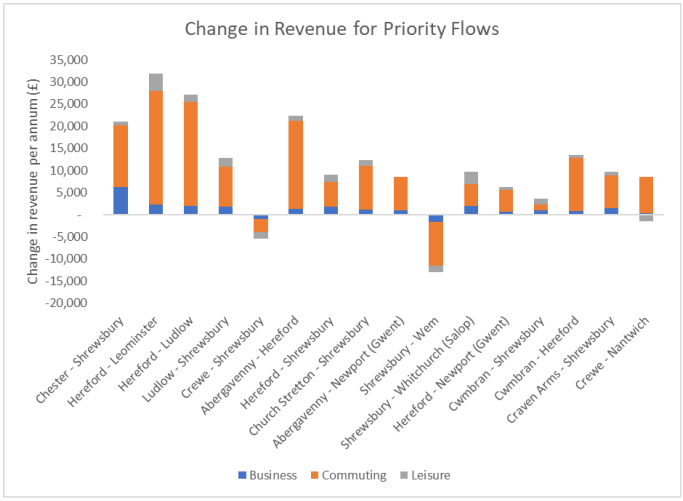
The table offers an unsurprisingly sequential improvement by ITSS phase, with the additional services built into each following phase and ITSS 5 realising almost £1m in anticipated Value of Time saving per annum. The key flows analysis set out in sub-question 1, demonstrated that the railway is heavily used by leisure travellers, and a time saving for passengers travelling for this purpose would be likely to promote return use of the railway along this corridor. The key flows captured also included those that are heavily frequented by students and commuters, so the proposals are likely importing significant value of time savings for other market groups as well. The increase in rail mode

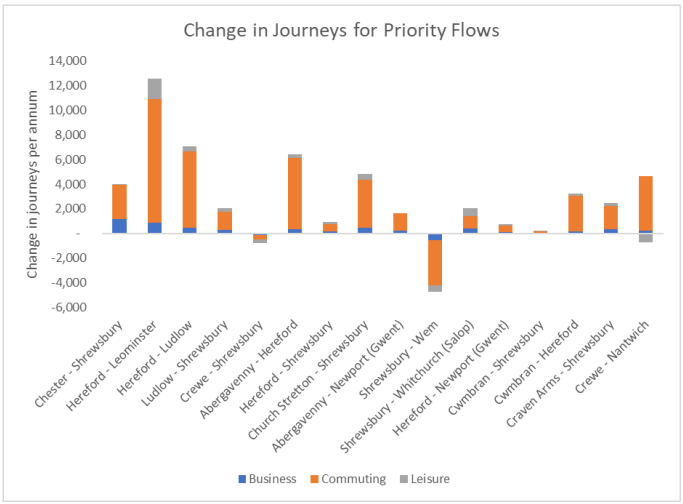
[13] Marginal External Costs include congestion, air pollution, noise, infrastructure and accident costs. The MEC method is based on the change in these external costs arising from an additional (or removed) vehicle (or vehicle km) on the network.

share demonstrates a positive move towards net zero emissions, as does the projected benefits for freight which seemingly promotes pulling freight from the road network and providing additional opportunities for freight operators.

A breakdown of changes to key flow revenue and journey demand for ITSS phases 2-5 is set out below to visualise the projected improvements in more detail. The Shrewsbury – Wem flow is showing negatively in ITSS 2 and 3; this is an imported disbenefit of the ITSS 2 timetable which offers 3tpd (trains per day) as opposed to the existing 6tpd in the December 2023 timetable (reflective of the commitments at the time of this ITSS development). This is responded to by ITSS 4 where the service is brought up to hourly.

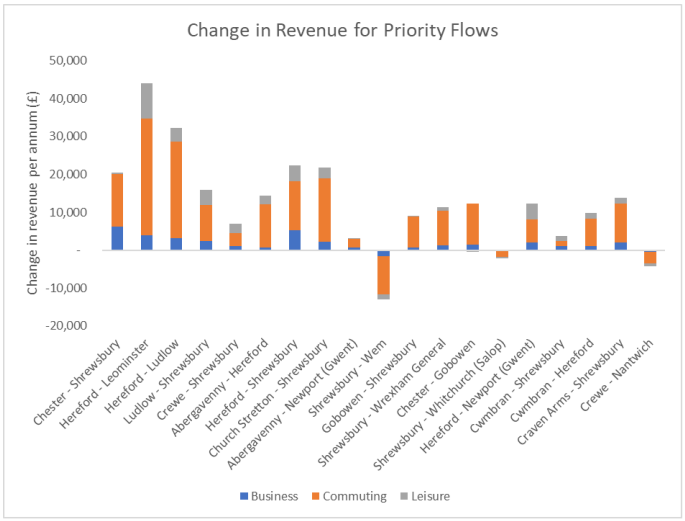
ITSS 2

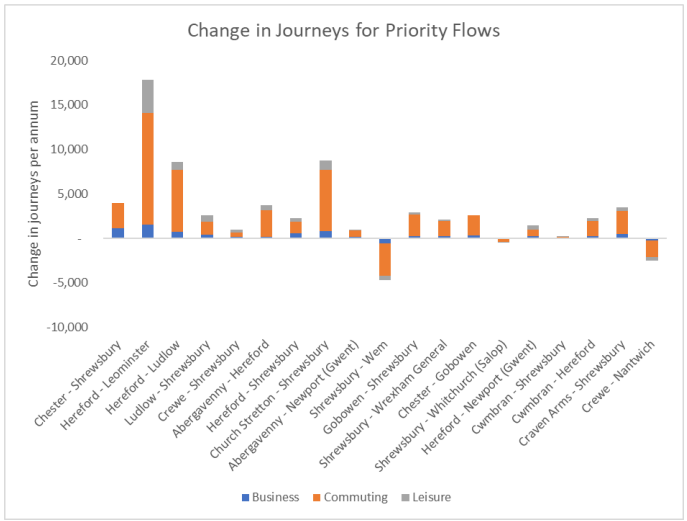




Figures 28 & 29 – Changes in revenue and journeys for priority flows as a result of ITSS 2

ITSS 3

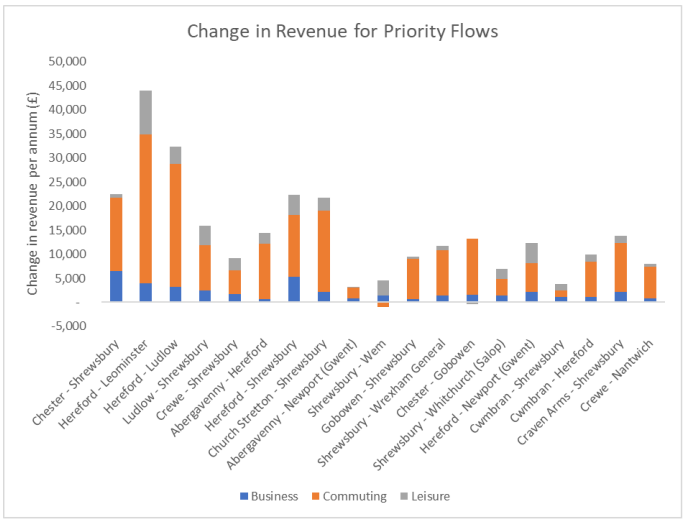


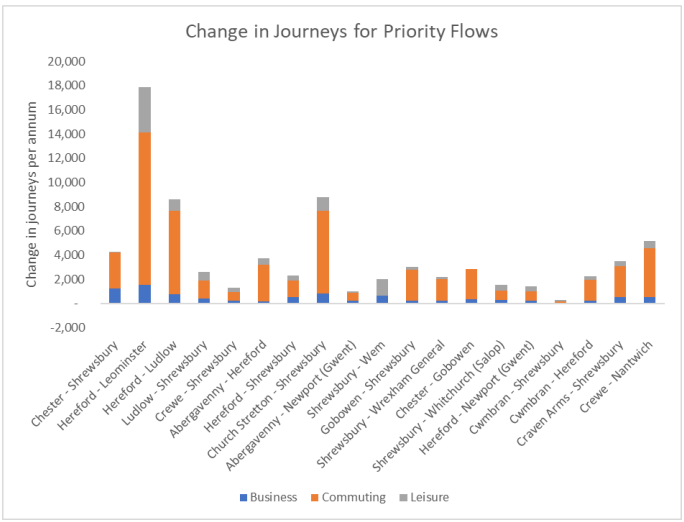


Figures 30 & 31 – Changes in revenue and journeys for priority flows as a result of ITSS 3

Wales and Borders

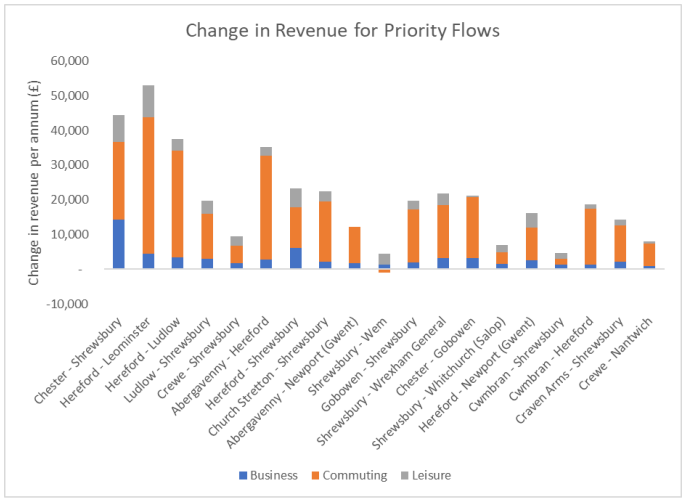
ITSS 4

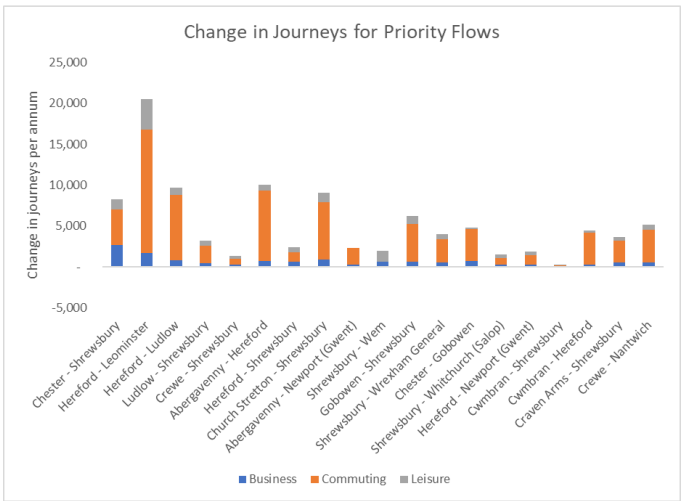




Figures 32 & 33 – Changes in revenue and journeys to priority flows as a result of ITSS 4

ITSS 5





Figures 34 & 35 – Changes in revenue and journeys to priority flows as a result of ITSS 5

Wales and Borders

Whilst socio-economic benefits are demonstrable for these proposals, the financial impact was as anticipated, due to the nature of the railway on this corridor. Provided in tables 18 and 19 are visuals demonstrating the net present value (NPV) and benefit cost ratio (BCR) against the societal benefits. A BCR of 1 or more is considered good value for money. Table 18 provides a view when considering CAPEX cost exclusively (high end), table 19 demonstrates the impact should even the most limited OPEX costs be considered (as well as the CAPEX cost).

Assumptions (CAPEX table)

- ITSS 2 is based on a full cost estimate as part of an existing project; other ITSS phases use an 'order of magnitude' range provided by the estimator.
- No Train Operating Company OPEX costs are included.
- No Network Rail OPEX costs are included where required.
- Schedule 4 payments are assumed to be 10% of the CAPEX cost.
- Optimism bias[14] was applied at PACE 1, 56% of the CAPEX cost.
- The figures set out the impact over a 60-year period.

Criteria	Metric	ITSS 1.5	ITSS 2	ITSS 3	ITSS 4	ITSS 5
Financial and welfare benefits trade-off (based on high level cost and estimated demand and revenue)	Rail users socio-economic benefits (£ million, 2010 prices)	-11.06	21.40	21.78	23.69	32.23
	Non-rail user benefits (£ million, 2010 prices)	-1.95	3.62	4.01	4.19	5.78
	Freight Benefits (£ million, 2010 prices)	0	0	-2.22	3.09	3.09
	Revenue (£ million, 2010 prices)	-4.26	7.52	8.28	8.80	11.73
	CAPEX estimate (£ million, 2010 prices)	0.00	5.64	19.11	21.82	51.52
	Net Present Value	**-16.87**	**25.77**	**12.67**	**12.32**	**-6.97**
	Benefit cost ratio	**-2.90**	**Financially Positive**	**2.19**	**1.96**	**0.82**

Table 18 – Financial and welfare benefits trade-off over a 60-year period with the cost of infrastructure interventions included

[14] Optimism bias is the tendency of individuals to expect better than average outcomes from their actions. In the context of rail infrastructure projects, optimism bias can lead to underestimation of project duration, overestimation of its benefits and underestimation of its total cost.

Wales and Borders

Assumptions (OPEX table)

- No Network Rail OPEX costs are included where required.
- The OPEX cost has been provided by one Train Operating Company only to understand initial impact; this cost is an 'order of magnitude.'
- The cost is based on one additional diagram in each ITSS only (on top of existing services) to demonstrate the initial impact.
- The figures set out the impact over a 60-year period.

Criteria	Metric	ITSS 1.5	ITSS 2	ITSS 3	ITSS 4	ITSS 5
Financial and welfare benefits trade-off (based on high level cost and estimated demand and revenue)	Rail users socio-economic benefits (£ million, 2010 prices)	-11.06	21.40	21.78	23.69	32.23
	Non-rail user benefits (£ million, 2010 prices)	-1.95	3.62	4.01	4.19	5.78
	Freight Benefits (£ million, 2010 prices)	0	0	-2.22	3.09	3.09
	Revenue (£ million, 2010 prices)	-4.26	7.52	8.28	8.80	11.73
	CAPEX estimate (£ million, 2010 prices)	0.00	5.64	19.11	21.82	49.59
	OPEX estimate (£ million, 2010 prices)	0.00	33.71	33.71	33.71	33.71
	Net Present Value	**-16.63**	**-8.40**	**-23.75**	**-18.83**	**-36.22**
	Benefit cost ratio	**-2.89**	**0.74**	**0.47**	**0.60**	**0.49**

Table 19 – Financial and welfare benefits trade-off over a 60-year period with the cost of infrastructure interventions as well as some liimited operational costs included

Have any further service scenarios been assessed as a response to stakeholder aspirations?

Upon reflection of the ITSS work carried out in late 2023, Network Rail sought further analysis from the Advanced Timetable Team that targeted the long-term aspiration for greater frequency to Abergavenny, set out in the South East Wales Transport Commission final recommendations report (November 2020).

Transport for Wales has been carrying out some initial development work to understand the feasibility of a turnback facility at Abergavenny, which would enable a shuttle service to and from Newport or Cardiff, but this would require further work to refine with the feasibility options. As this exploratory work is at an early stage, the timetable analysis carried out by Network Rail assumes that the services would require the introduction of this proposed turnback facility. This proposal would require a facing point lock installed at some locations, an additional track circuit and additional main line signal with the associated shunt signal but would require less intervention than a turnback facility and could therefore be used as a short-term solution, depending on the desire to progress with an enhanced Abergavenny service proposal.

The work remitted by Network Rail sought to implement an additional 2tph to Abergavenny, looking at the possibility of 1tph in the first instance, between the study timeframe of 10am – 4pm. The first option looked at implementing this service against the baseline; the December 2023 timetable. The second phase looked at implementing this service alongside ITSS 3 proposals. The work did not identify any intermediary stops. This work will act as a starting point for future development of this proposal.

Wales and Borders

December 2023 – Abergavenny Shuttle

Absolute Block (AB): Only one train an occupy a defined section of track (block) at a time.
Pathing: Extra time to ensure the train path does not conflict with others.
Flexed: Moved
Junction Margin: The minimum permissible time interval between two trains that are performing conflicting moves at a junction timing point.
Headway: The time between two trains travelling in the same direction.

Cardiff Central - Abergavenny

The analysis work identified that it is currently only possible to provide one additional train path per hour from Cardiff Central to Abergavenny within the specified boundaries, as shown in the timetable extract in Appendix 6a.

Four of the six paths identified have pathing time at Maindee North Junction, with two of the paths (10:12 and 14:33) having a greater pathing time of five minutes and six minutes respectively, to avoid the Absolute Block conflict between Little Mill Junction and Abergavenny.

Furthermore, whilst these paths are viable; some neighbouring services have needed to be flexed to allow these paths to work in practice:

- 10:12 – The existing 6M61QJ unit has added pathing time and removed extra dwell, however the overall arrival and departure times remain the same.
- 11:21 – A minute's pathing time has been added to train 1W93DB. Adding one minute pathing time at Maindee West Jn fixes the already existing headway, AB, and Junction Margin conflicts, however this increases the journey time by one minute. An alternative option, to keep journey time, as well as arrival and departure times unchanged would be to add one minute's pathing time at Maindee West Junction, reduce the existing dwell time at Shrewsbury and remove 30 seconds of pathing allowance at Rossett Junction. This would also require the removal of three and a half minutes pathing at Sutton Bridge and adding those at Marsh Brook Level Crossing.
- 13:29 – neighbouring train 6M86FA has been flexed by changing the dwells at two stops - (Maindee North Jn and Panteg) - but keeping the overall arrival and departure time the same.
- 15:36 – neighbouring train 2N18DC has been flexed by adding one minute of pathing time at Park Jn and removing it from Long Dyke Jn to keep the overall arrival and departure timings unchanged.

These timing changes are visualised in Appendix 6a.

It is not possible to enhance the service beyond the additional 1tph due to the heavy traffic between Cardiff Central and Maindee North Junction, which is creating numerous Junction Margin conflicts. Furthermore, the long block section between Little Mill Junction and Abergavenny requiring plus two minutes of headway and the Little Mill Junction – Maindee West Junction section requiring five minutes in either direction adds further prevention of this enhancement. There is also added complexity with the single line from Maindee North Junction requiring a three-minute window between the previous train passing Maindee North Junction and the following train re-occupying the section. Significant intervention would be required here, alongside the proposed changes set out in

the five-phase ITSS commentary, part of which lies outside the boundaries of this study and would require wider consultation., including a potential recast of the South Wales Main Line (if an additional 2tph were the long-term goal for stakeholders).

Abergavenny – Cardiff Central

As with the Northbound proposal, it has only been possible to identify one additional train path per hour from Abergavenny to Cardiff Central, and existing paths required flexing to accommodate these services:

- 10:22 – The existing 2N08DC unit has been flexed to allow this path to work.
- 14:27 – three neighbouring trains required flexing; 6M36FF had its dwell timings at Maindee North Junction reduced and pathing time increase (retaining the overall arrival and departure times), 6B65DA was flexed by also reducing its dwell time at Maindee North Junction by one minute and increasing the dwell at Hereford by one minute, and finally 2N16DC was flexed by changing platforms from platform 4 to platform 2.

These changes are visualised in Appendix 6b.

Whilst this scenario does not explore intermediary stops, a high-level assessment suggests that a stop at Cwmbran on this service is feasible for half of the proposed trains to and from Abergavenny (within the remit timeframe), however some other paths would require an additional intermediate block signal between Little Mill and Abergavenny and two of the paths would not work at all due to turnaround time.

ITSS 3 – Abergavenny Shuttle

Cardiff Central to Abergavenny

An hourly path has been successfully identified for Cardiff – Abergavenny on the basis of a timetable that includes the enhancements set out in ITSS 3. The fundamental difference between running the service as part of the baseline December 2023 timetable and as part of the enhanced ITSS 3 proposal is the requirement for an additional signal between Abergavenny and Little Junction to respond to the long block section conflicts. This intervention would be triggered by the paths identified between 1pm and 2pm, and 3pm and 4pm, as identified in the timetable in Appendix 6c.

Each additional hourly path identified required changes to pathing; either small increases to pathing timings or minor decreases in pathing times to resolve junction margin conflicts. In the case of the 11am – 12pm path, a neighbouring train required flexing but the overall arrival and departure time remains the same.

The proposed additional signal would allow trains to follow each other more closely, which would ensure these paths can be properly accommodated. The figures below demonstrate the change created by the additional signal (the example set out below uses the 3pm – 4pm path as an example).

The yellow highlighted block shows the Absolute block section which is defined as only one train can occupy a defined section of track at a time. The red line block is the minimum time after which the train can pass in that section. In this case, the next train can enter that section of tracks after the two minutes of the Absolute Block highlighted in yellow. The black dotted line represents the possible

Wales and Borders

path that the train could use in the case that an additional signal has been implemented between Abergavenny and Little Mill Jn.

Figure 36 – Absolute block conflict between Abergavenny and Little Mill Junction prior to installation of an additional signal for the 3pm path

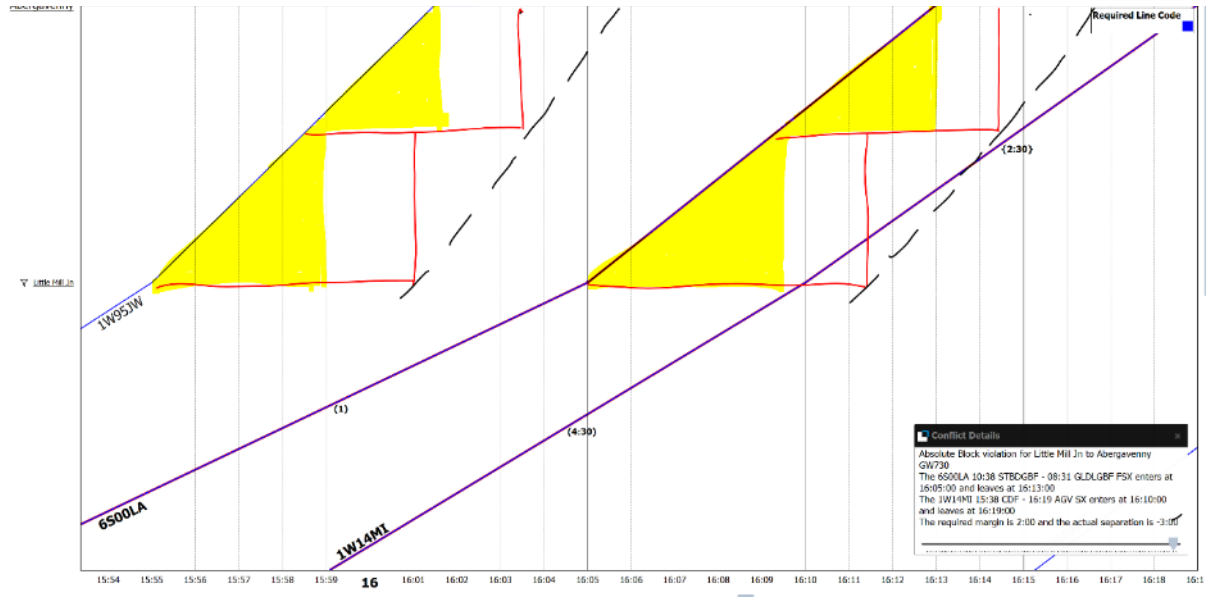


Figure 37 – Absolute block section with the addition of a signal for the 3pm path

Abergavenny to Cardiff Central

As per the Northbound direction, the work was able to identify an additional hourly path between Abergavenny and Cardiff. Similarly, the train paths between 10am and 11am and 2pm and 3pm

would require the proposed additional signal between Abergavenny and Little Mill Junction. A timetable is set out in Appendix 6d.

To visualise the changes imposed by an additional signal, the images below show the 10am – 11am path pre- and post- signal:

Some minor flexing of services is required to accommodate these paths, despite the proposed additional signal.

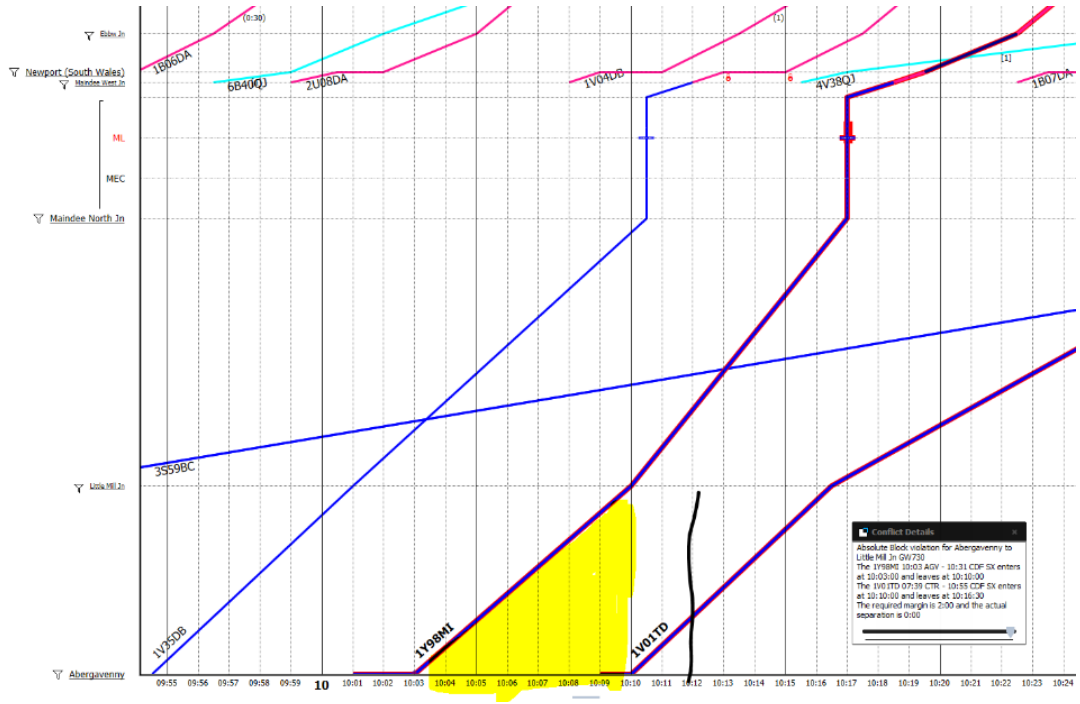


Figure 38 - Absolute block conflict between Abergavenny and Little Mill Junction prior to installation of an additional signal for the 10am path

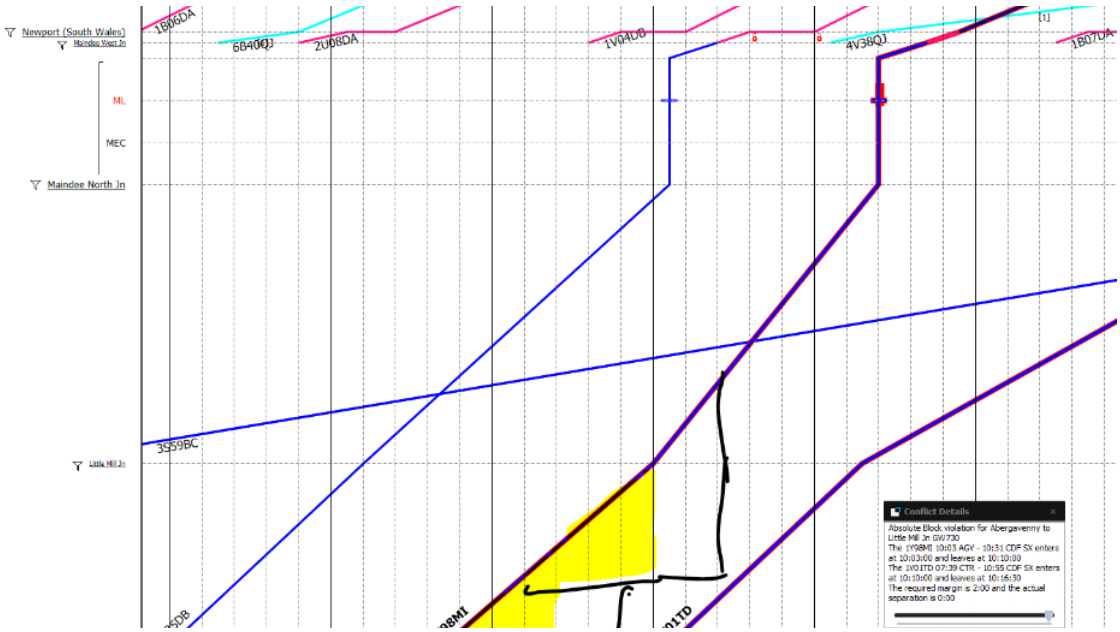


Figure 39 - Absolute block section with the addition of a signal for the 10am path

Wales and Borders

SQ 3 – What is the role of rail in the Marches corridor in supporting the roadmap to net zero?

In 2021, the UK Government published a Net Zero Strategy[15] that builds on the 2020 Ten Point Plan for a Green Industrial Revolution, which responds to the ever-growing issue of climate change in the UK. Similarly in 2021, Welsh Government set out its legal commitment to achieve zero emissions by 2050, however it has specified interim targets for 2030 and 2040 to drive decarbonisation in Wales. Whilst these targets are ambitious, rail has an instrumental role in driving the move towards a greener UK.

What does rail usage look like on the Marches?

The following maps show the rail mode share across the country based on Mobile Network Data, with the dark blue showing low mode share and the light-yellow shows a share of >5%. The national average for rail modal share is 3%. In comparison with other locations in Wales and England, the Marches has a mix of areas with relatively high and low rail share (that is, higher and lower than the national average). The majority is however sitting below the national average.

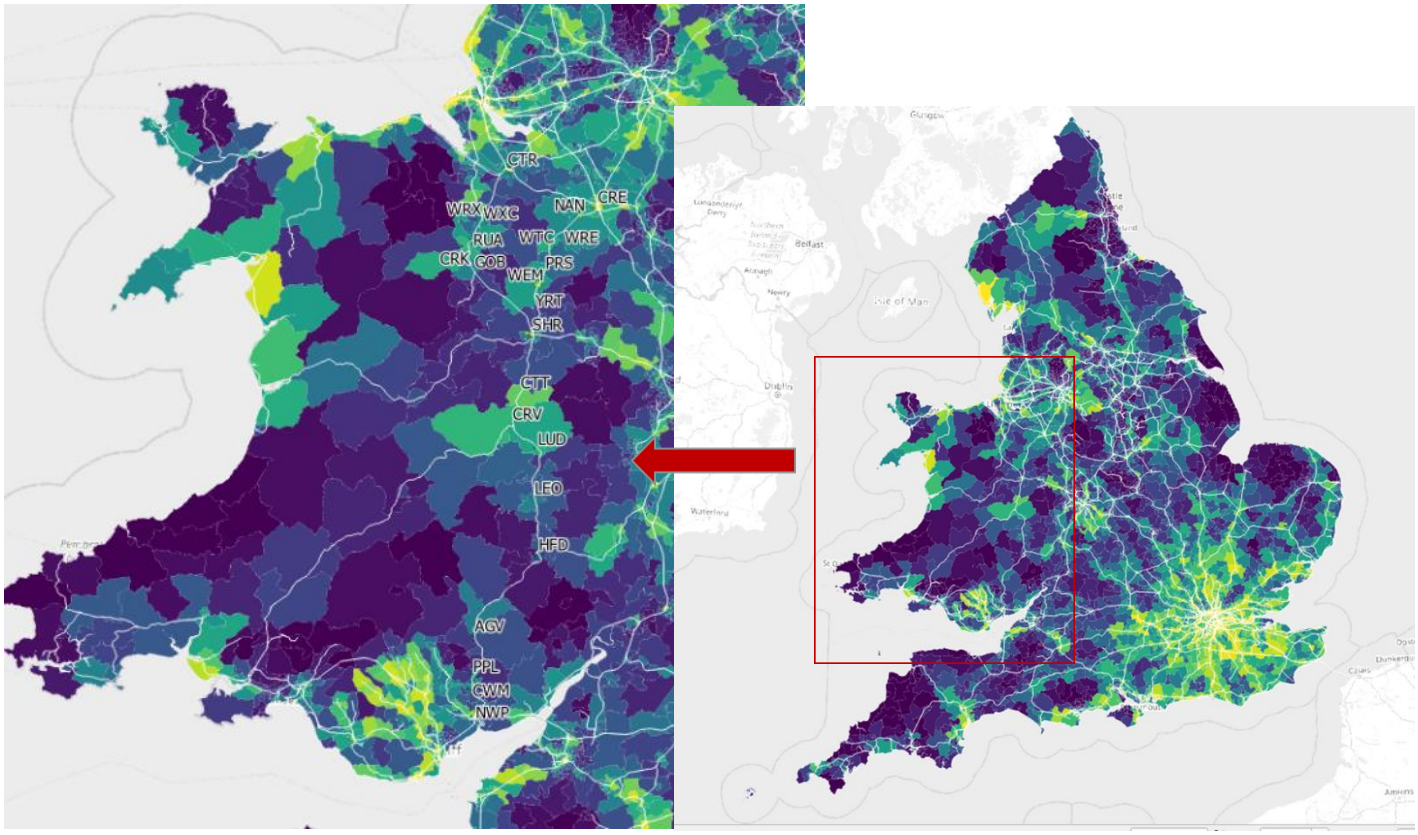


Figure 40 – Rail mode share across the UK and the Marches

[15] Net Zero Strategy: Build Back Greener - GOV.UK (www.gov.uk)

Wales and Borders

It is notable that this data only captures journeys with more than 50% of the journey made by rail; this means that a commuter who considers their 25-minute train journey as their mode of transportation may not be captured within this data if their travel either side of this rail journey is greater than the rail journey time. This is especially relevant for the Marches line where the markets are extensive and capture passengers from a significant distance outside the standardised station catchment areas.

The following tables show a breakdown of mode share at individual catchment areas along the corridor. Despite the Marches weighted average sitting at the same percentage as the overall UK national figure for rail modal share (3%), the majority of station catchments fall below the average, as shown below:

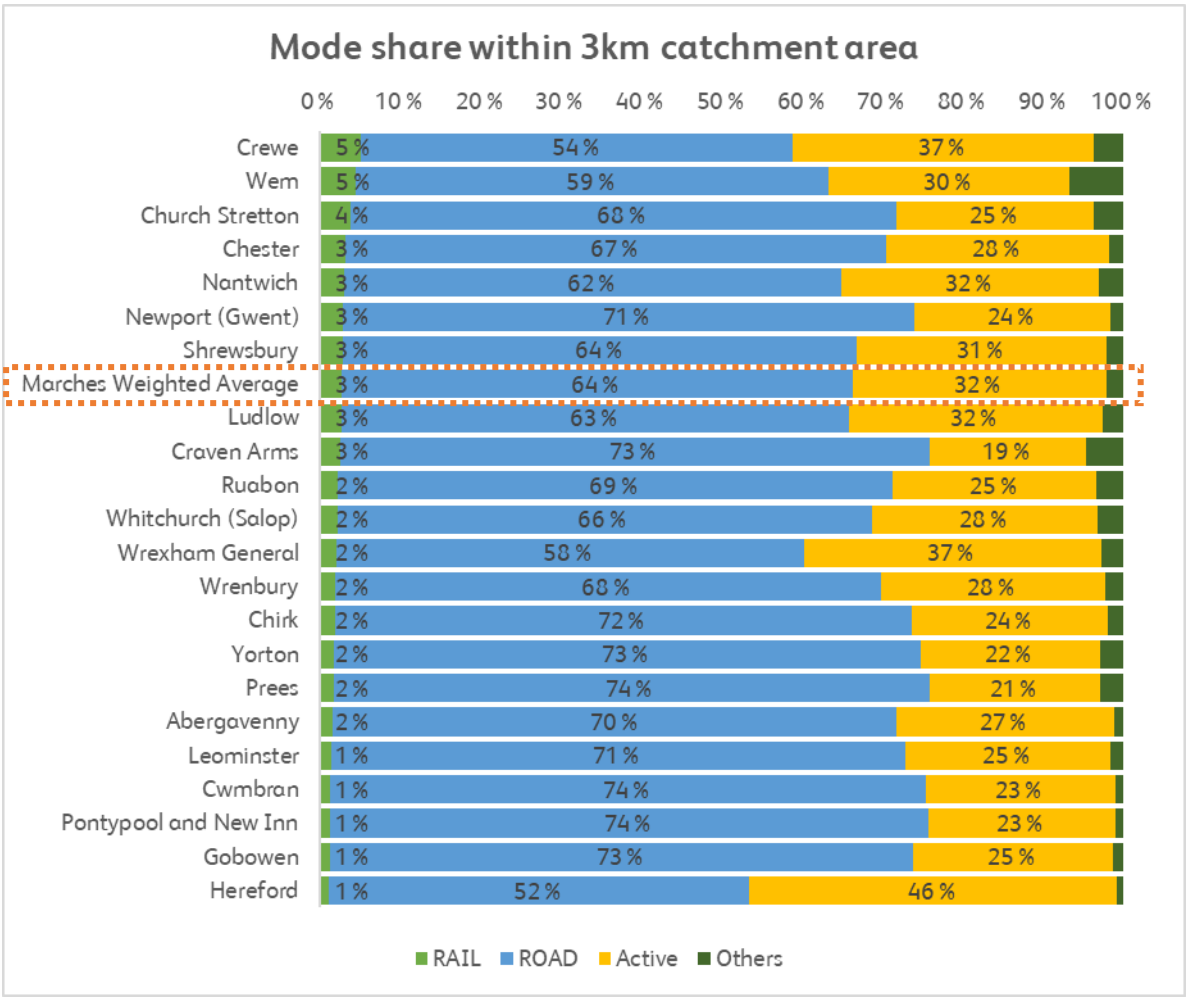


Figure 41 – Mode share breakdown at individual stations (within 3km catchment area)

The data corroborates previous economic analysis and survey data which shows that station usage along the Newport – Shrewsbury corridor is heavily impacted by private vehicle usage (Abergavenny, Leominster, Cwmbran and Pontypool and New Inn). The low mode share at these stations could be a result of inconsistent rail options (particularly in the case of Pontypool & New Inn), or perhaps reflect the level of affluency in areas such as Abergavenny and Leominster where private car

ownership is likely higher. Gobowen also shows a high proportion of road usage, however this could (in part) be as a result of the station proximity to the hospital in Oswestry and the lack of current onward travel options that would be palatable to a passenger travelling to the hospital for a given reason. Similarly, other stations demonstrating less than average rail share and high road usage (Chirk, Yorton, Prees, Wrenbury) also currently have inconsistent rail options.

Further breakdown by catchment area distance is outlined below. Interestingly, stations north of Shrewsbury on the SYC show higher rail usage by those further afield (Nantwich, Prees and Yorton). This aligns with Figure 16 (earlier in the study) which suggests that rail is more attractive for for longer journeys. Nurturing this market will be critical to building on rail mode share in this area, whether this is done by improving service options on the line or offering more sustainable travel options to the station. This is also true of Craven Arms, where it is possible (as referred to earlier in this study) that the fringes of the mid-Wales market is being captured. Wrexham General has a poor level of mode share as a key hub along the route, albeit onward connectivity from the station is acceptable as there are a multitude of options, and rapidly improving as part of the wider Wrexham Gateway scheme which seeks to provide better bus integration and a new transport hub near the station. Greater connectivity to hubs beyond Chester may encourage better rail usage within this catchment area.

Station	Rail Mode Share			Population within		
	1km	3km	5km	1km	3km	5km
Abergavenny	1.5%	1.7%	1.3%	680	9,585	13,838
Crewe	7.4%	5.1%	4.2%	10,669	51,842	87,518
Chirk	2.1%	1.9%	2.0%	244	2,965	11,401
Craven Arms	2.5%	2.6%	2.6%	80	649	1,823
Chester	6.3%	3.2%	2.7%	14,267	61,719	94,585
Church Stretton	3.9%	3.8%	2.8%	216	1,920	3,390
Cwmbran	1.6%	1.4%	1.3%	5,601	37,913	72,510
Gobowen	1.6%	1.3%	1.2%	128	4,309	23,425
Hereford	1.5%	1.1%	1.1%	7,126	44,198	62,210
Leominster	1.6%	1.5%	1.4%	868	6,649	13,225
Ludlow	2.7%	2.7%	2.5%	2,549	11,511	13,262
Nantwich	4.0%	3.1%	4.1%	7,324	24,311	58,312
Newport (Gwent)	4.7%	2.9%	2.3%	10,408	79,470	127,254
Pontypool and New Inn	1.6%	1.3%	1.4%	1,977	16,119	51,939
Prees	1.9%	1.8%	2.2%	161	1,443	5,779
Ruabon	2.3%	2.3%	1.8%	350	8,129	20,864
Shrewsbury	4.9%	2.9%	2.4%	9,199	55,448	79,259
Wem	5.3%	4.6%	3.1%	4,748	7,283	10,261
Wrenbury	1.8%	1.9%	1.7%	169	2,964	4,179
Wrexham General	2.4%	2.1%	2.1%	7,631	56,828	80,017
Whitchurch (Salop)	2.5%	2.3%	2.1%	1,365	9,547	11,210

Table 20 – Rail mode share at individual stations at different catchment distances

Wales and Borders

In reviewing this data, it is clear that there is ample opportunity to improve rail mode share along the corridor, which would play a key role in working towards the net zero target imposed by both Welsh and UK Governments.

What is the future of rolling stock on the Marches?

Fleet strategy, alongside future infrastructure changes, plays a key role in the future of decarbonisation on the Marches line. We have therefore engaged with Transport for Wales (TfW) as the primary Train Operating Company along the Marches corridor, on their future rolling stock plans.

The current fleet, which has been recently introduced, is formed of Mark 4 rakes and Class 197 DMUs. TfW estimates that the Mark IV stock has a remaining life of circa ten years; it has also acknowledged that considering the possibility of alternative rolling stock to the Class 197 DMUs within a similar timeframe in the mid-2030s, for the purpose of working towards decarbonisation if a non-diesel solution is viable. A review of options suggests that a positive way forward would to be replace both fleets with either a single fleet or two similar fleets, that would further the aspiration to meet net zero carbon emissions. Whilst long-term aspirations set out by TfW, as well as the Wales & Western Regional Decarbonisation Strategy points toward fully electrifying the Marches line (which would allow electric freight operation), it is acknowledged that an interim option may need to be explored. TfW were the first to utilise discontinuous 'heavy rail' electrification on its Core Valley Lines network to avoid the re-structure of costly bridges. The further advancement of this concept is partial electrification where you install infrastructure in the low-cost areas to support the dynamic charging needs for a battery electric fleet. A potential decarbonisation option to explore is therefore partial electrification combined with the operation of battery/electric. Dynamic charging options will also need to be explored. Whilst no funding is currently available for this replacement fleet or necessary infrastructure interventions, it is advisable to investigate these options at an early stage.

Recent dialogue with manufacturers has shown significant potential for Battery Electric Multiple Unit (BEMU) as a diesel replacement. Partial electrification of a relatively small percentage of the route (in easier to electrify sections) combined with BEMUs with moderate sized batteries could have a total cost that is lower than equivalent diesel operation over 30 years as well as providing large annual fleet emissions savings. Such rolling stock would be faster, reliable, and more comfortable, leading to the potential for encouraging long-term mode shift from road to rail. Alongside the growing market demand to this type of traction, Network Rail's experts are consistently investigating new thinking around electrification proposals; therefore, the opportunity to develop this thinking should be undertaken in the near future for a greener, healthier railway to come in the next few decades. Network Rail's Wales and Western regional team have pioneered innovations to reduce the cost of future electrification and developed traction modelling to support development work into partial electrification.

Reflecting on SQ 1, what first/last mile opportunities are there that will help enable modal shift?

The reality highlighted by the passenger surveys undertaken in November 2023, is such that despite the primary means of transportation to and from Marches stations being walk/wheel, private vehicle usage is a large proportion and far greater than other modes of transportation. The visual below

which shows how passengers arrive at their origin station and left their destination station, for mode choice at Marches stations only (stations within the study area).

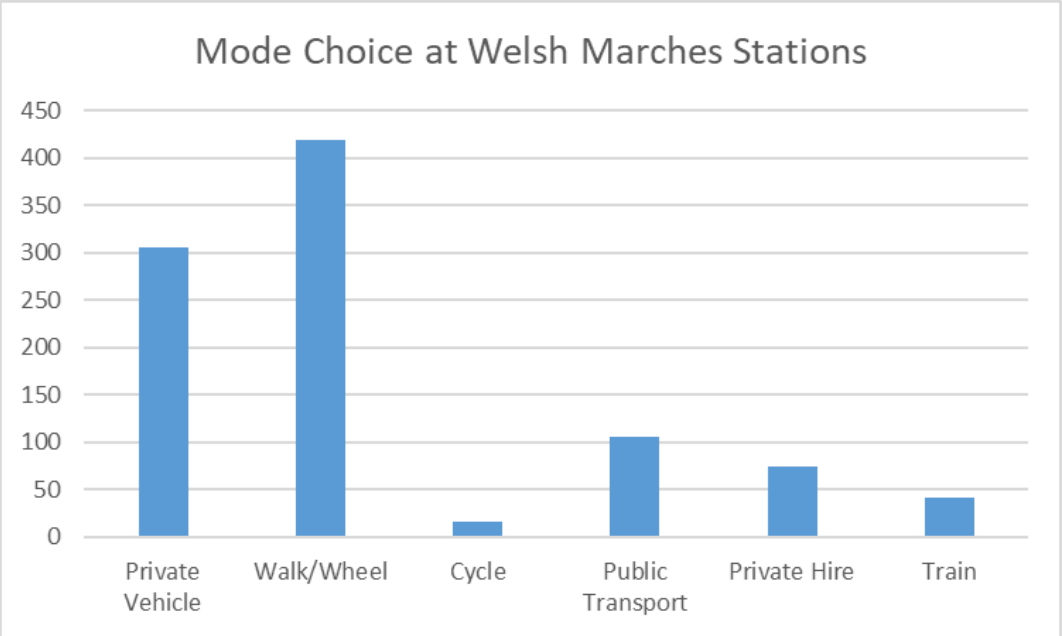


Figure 42 – Survey responses for mode choice arriving and departing from Marches stations

A significant number of passengers use a private vehicle to access/depart from the station. As mooted in SQ1, this could be in large part due to the distance of travel. Whilst active travel proposals are numerous along the corridor, this may not respond well to markets further afield. It would therefore be prudent to consider the long-term benefits of one or more park and ride solutions that may serve to shorten the distance travelled by private vehicle and replace a portion of the journey with a sustainable travel option, such as onward travel via bus. Whilst this solution does would not appeal to a fully net zero approach, it does serve to move toward that target whilst also responding to the regular at-capacity status of some station car parks along the corridor, particularly if one or more of the proposed service enhancements were to be delivered.

Significant sustainable proposals are being made at key hubs along the corridor and are therefore crucial to promote modal shift among high passenger number. Newport City Council is driving active travel and sustainable transport options for the south end of the line. A recent bridge installation at an optional station site for Caerleon has offered futureproofing for any potential future station, as well as provided access to the Roman remains' tourism location, encouraging more sustainable tourism. This area is also linked up with an existing cycle route into Newport station. An additional public consultation has been held for the 'Old Green' which proposes to pedestrianize this notorious interchange to the East of the station, which is currently the only area with no suitable active travel option between Newport station and Caerleon. This wholescale transformation would have a significant impact on traffic reduction as there is a large catchment area beyond this interchange for station users who would have a new sustainable option for travel to the station. Newport has also converted 100% of its urban bus services to electric, therefore the rapid transit bus proposal to The Grange (set out earlier in this study) would be wholly electric with zero emissions. There are further bus rapid transit proposals to other key locations in Newport such as the International Convention Centre (ICC), which attracts visitors UK-wide for conventions, and the ability to have a sustainable option for onward travel from the station to the convention centre would likely trigger significant

modal shift for large events in the area. The proposal to bring these services into the station area would further promote this goal.

There are also ample proposals to in improve sustainable onward connectivity at Wrexham General station. As part of the Wrexham Gateway scheme, there are live aspirations for a new transport hub that would remedy the issues around poor bus integration at the station and improve access into the station. The proposals respond to public consultation feedback, as well as the proposed implementation of a new 5,500 people stand at the football stadium, which is situated minutes from the station itself. Wrexham Council are supportive of the Wrexham Gateway proposals whilst also building on the opportunities presented by the scheme alongside the ever-growing tourism in the area with an active travel proposal along Mold Road (which acts as one of the main through-roads for traffic through Wrexham). Similar to the proposals set out in Newport, the provision of an active travel scheme along a key traffic-heavy route would be integral to modal shift by offering a sustainable, cost-effective option for connectivity to the station.

Shrewsbury Town Council is also heavily engaged with active travel proposals and medium-term plans to relocate the existing Shrewsbury bus station to provide better connectivity to the station. The council's Shrewsbury Station Gyratory proposals set out to improve public space and provide walking and cycling improvements in the town centre, including the area known as the station gyratory. The three-phased proposals look to establish active travel corridors to the south, north and general improvements to the gyratory area which would provide a north-south active travel route past the station. The gyratory phase also includes a road layout change. These proposals have been consulted publicly and as with the other proposals set out previously, would contribute significantly to moving rail passengers from vehicles onto active travel routes.

Reflecting on the Wales & Western Regional Decarbonisation Strategy, what are the proposals for the Marches line?

In March 2021, a Wales & Western Regional Decarbonisation Strategy was commenced, with the purpose of setting out the vision for the region's contribution to achieving net zero emissions by 2050. The objective of the strategy is:

> *"Elimination of all diesel-powered passenger and freight trains operating in Wales & Western region in support of the UK government legislative requirement and Welsh Government legal target for a net-zero carbon transport system by 2050."*

A multi-criteria assessment framework was established to identify appropriate 'tranches' and proposed future changes to infrastructure. The strategy says that criteria were grouped and weighted with two over-arching categories: Decarbonisation benefits and deployment efficiencies, the former quantifying the potential value of decarbonising each route section, and the latter quantifying integration with power and signalling systems, as well as alignment with rolling stock changes. The criteria considered items such passenger diesel vehicle miles removed per single track mile decarbonised, freight decarbonisation potential, rolling stock lifespan and availability of power supply/redundancy.

The multi-criteria outcome showed that all sections of the Marches geography considered in this study would realise significant decarbonisation benefits, with the Newport – Shrewsbury stretch scoring more highly against deployment benefits than either Shrewsbury – Crewe or Shrewsbury – Chester, but none were identified as appropriate for 'Tranche 1' options which more closely aligned

with committed rolling stock plans, existing development at the time and the Union Connectivity review findings. The geographical railway included in this study were proposed for 'Tranche 2' (of two tranches) to be fully electrified. The strategy acknowledged the importance of aligning Shrewsbury and Hereford proposals with Northwest and Central decarbonisation plans due to the impact on both Avanti and West Midlands Train services, as well as recognised the likely inability to upgrade the Class 197 DMUs to a bi-mode fleet prior to end of life.

The Wales and Western regional decarbonisation strategy is being updated in line with the new partial electrification concept and will be available later this year.

What are the strategic conclusions to meet net zero carbon emissions targets?

Whilst the long-term strategy set out by the Wales & Western Regional Decarbonisation Strategy are clear that full electrification would provide the best decarbonisation benefits for the Marches line, a wholesale 'big bang' approach may not be the only solution and a phased path to realising a net zero rail network may offer a more realistic option over the coming decades. The partial electrification concept will be explored more widely across the region including the geographical area of this study and will be incorporated into the new traction decarbonisation strategy available later this year.

Given the extensive geography covered by this infrastructure, the requirement to align with multiple Train Operating Company decarbonisation plans, the nature of the infrastructure itself and the existing financial climate in the UK, it is pertinent to consider intermediary options for decarbonisation. A partial electrification solution would not only future proof for full electrification in the future but would enable several rolling stock options for Train Operating Companies that could be utilised both medium- and long-term across the route. Funding constraints would suggest that smaller, but futureproofed, interventions may also be more achievable as we work towards our longer-term goals. Furthermore, connectivity to the railway and a focus on the provision of sustainable options for onward travel is advisable, with park and ride options (to meet the market demand of passengers travelling from greater distances) being a similar phased approach to net zero. A phased approach would likely aid in achieving Welsh Government's intermediary targets for decarbonisation in 2030 and 2040.

Wales and Borders

SQ 4 – How can stations on the Marches be made fit for the future?

What does the passenger experience look like at stations along the route?

There are 22 stations in the Marches corridor identified within this study. As part of the survey, conducted on Tuesday 28th November 2023 (545 respondents) to support this study, passengers were asked about what they did and didn't like about their origin and destination stations, how satisfied they were with the stations (scoring 1-10) and what station improvements they would like to see. Figure 43 shows that only 20% of respondents scored their origin station 6 or lower.

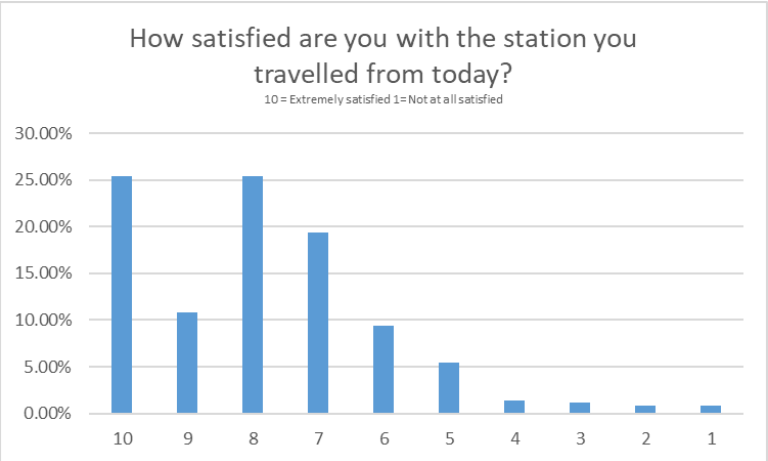


Figure 43 – Survey responses for station satisfaction

As in Figure 44, the majority of respondents travelling from stations specifically within the study area were very satisfied. Gobowen, Chester, Wrexham General and Chirk stations all scored above 8, with no station scoring lower than 6. This indicates that there is a good level of satisfaction experienced at stations within the study area.

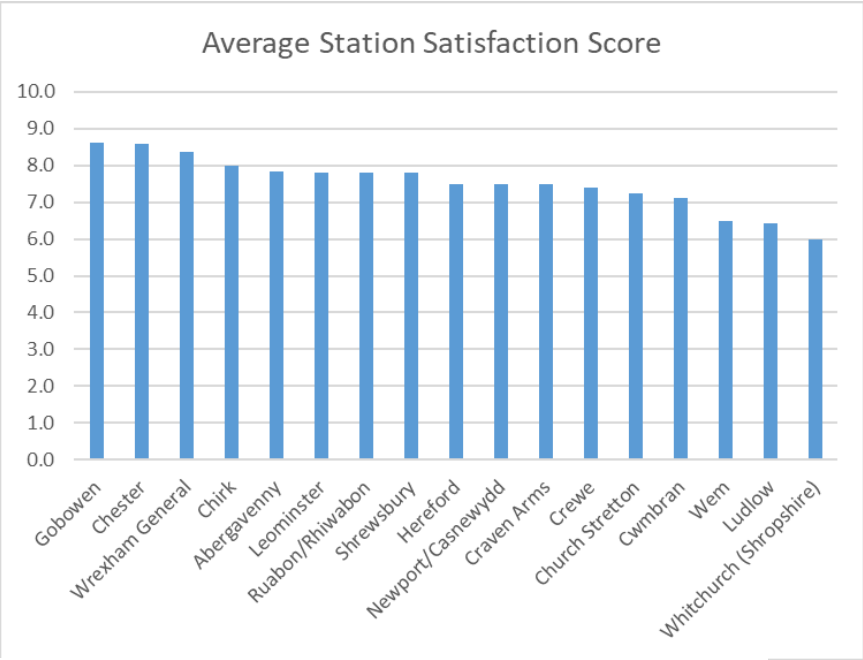


Figure 44 – Survey responses average station satisfaction score

Staffing, ease of use and cleanliness were the most frequently reasons quoted for satisfaction, as shown in figure 45.

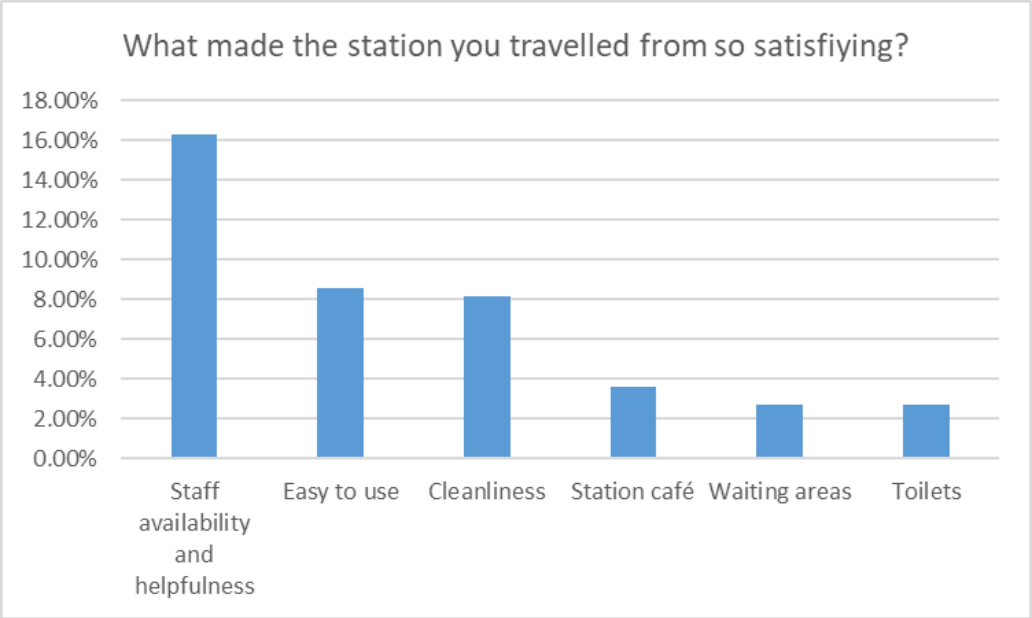


Figure 45 – Survey responses for reasons behind positive satisfaction scores

When asked about suggested improvements for stations within the study area, there were numerous suggestions. The primary suggestion was the provision of more/better seating or waiting areas with more/better toilets and better station upkeep closely thereafter in the top suggestions. Interestingly, more car parking was mentioned on more occasions than better public transport access and more/better cycle parking, which were raised, but by significantly fewer respondents.

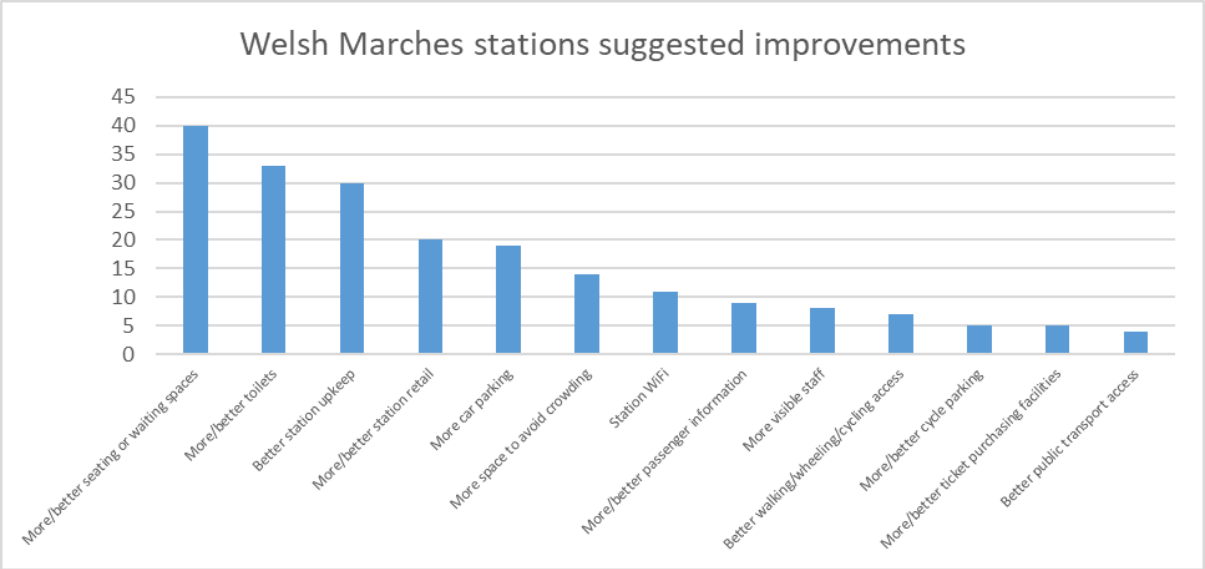


Figure 46 – Survey responses for suggested improvements at Marches stations

A series of station site visits were conducted with the Network Rail Senior Station Capacity Planner to review and assess the facilities at each of the stations along the Marches lines of route.

Wales and Borders

A minimum station facility provision has been previously identified to set a base for what should be provided at each station to meet passenger needs. Based on Transport Focus' research and the drivers for passenger satisfaction identified in Network Rail's Station Design Guidance, the following minimum provision is recommended:

Facility	Rationale
1) Live train information	To provide passengers with accurate and timely journey information
2) Covered seating	To provide a reasonable level of passenger comfort in all conditions
3) Litter bins	To support and maintain a clean station environment

Table 21 – Minimum station facility defined by Network Rail's Passenger and Station Analysis team

The following table compiles a list of each of the 22 stations on the corridor, setting out the facilities available and where improvements could be made.

Station	Minimum facility Provision	Pros	Areas of Improvement
Newport/Casnewydd 	1) ☒ 2) ☒ 3) ☒	• Food and drink options available. • Shelter on each platform. • Covered walkways. • Toilets. • Accessible lifts (both sides). • Car park at rear. • Staffed. • Small waiting room on P4. • Good onward connectivity options. • New cycle storage facility opposite the station.	• Poor road configuration. • Signage from the station exit is somewhat unclear for onward travel. • No cycle storage at the station itself. **Recommendations:** Given the availability of active travel routes from the station, the stain would benefit from a cycle storage unit within the lease area.
Cwmbran/Cwmbrân 	1) ☒ 2) ☒ 3) ☒	• Toilets. • Waiting areas on both platforms. • Staffed. • Good size car park. • Food and drink options available • Good onward connectivity options, including short walk to town centre. • Buses can pull into the station as well as	• Poor signage to station. • Poor lighting. • Currently not accessible (but sits in the Access for All workbank). **Recommendations:** Given the areas connectivity to the 'learning zone' for Torfaen students, better lighting provision is important. More/better signage to and from the station would be helpful.

Wales and Borders

		central bus station being only 5-7 minutes away.	
Pontypool & New Inn 	1) ☒ 2) ☒ 3) ☒	• New car park completed with connection to A4042 (not yet open). • Accessible. • Footpath connectivity to local housing on pedestrian side. • Bus links from new car park. • Cycle shelter. • Sheltered seating.	• Visibility of the station is poor; both from the road and from the pedestrian walkway bridge. • Vegetation is extensive on access routes. • No signage towards the station from local estates or pedestrian walkways. • Limited active travel routes due to location near trunk road. **Recommendations:** De-vegetation of access to the station would be helpful. Better active travel provision to small towns nearby that aren't served by stations would likely promote increased rail usage; Usk/Little Mill.
Abergavenny/Y Fenni 	1) ☒ 2) ☒ 3) ☒	• Access for all scheme to be completed this year. • Café with hot food and drink options. • Decent station condition and lighting. • Toilets • Sheltered areas on both platforms. • Cycle storage. • Waiting rooms on both platforms.	• Proximity to trunk road and no designated active travel route promotes accidents. • Lack of ample car parking, exacerbated by access for all bridge. • Station forecourt can be tricky for pedestrians due to sharing the access with cars and taxis. **Recommendations:** As a hub, Abergavenny is a well-facilitated station, but lacks smooth onward travel connectivity. Better pedestrian access via designated active travel routes would be advisable. The station would also benefit from better car parking provision, though it is acknowledged that an extension of the existing car park would be difficult due to topography. A park and ride option situated further afield may be worthwhile investigating.

Wales and Borders

Hereford/Henffordd 	1) ☒ 2) ☒ 3) ☒	• Toilets • Sheltered seating • Café with hot food and drink options • Accessible • Cycle storage • Waiting rooms • Hereford station masterplan proposes a bus interchange at the station for better onward connectivity, as well as station forecourt transformation for better pedestrian access.	• Current gateline is an issue for overcrowding on platforms. • Survey feedback suggests toilets/general station cleanliness can be poor. **Recommendations:** Understanding options for better gateline access is advisable; whilst station staff note this as an issue, there is no evidence of performance issues. From a site visit, it is however clear that the limitations of the gateline could cause delay for passenger access. Attention to upkeep and/or improvements to toilet facilities.
Leominster 	1) ☒ 2) ☒ 3) ☒	• Accessible • Car park (though not large) • Sheltered seating • Cycle storage • Staffed	• Café unit empty • No toilets • Poor signage • Not well served by sustainable modes • Platform canopies need cleaning. **Recommendations:** Development of sustainable travel onward connectivity to the station. Station signage improvements, as well as better southbound train information visibility – this is currently not available until you've accessed the southbound platform.
Ludlow 	1) ☒ 2) ☒ 3) ☒	• In person station building with refreshments and timetable information. • Plenty of walking routes from the station. • Defibrillator at station. • Cycle storage • Car park available (though not large). • Good signage	• Uneven steps on railway bridge – trip hazard • No toilets but local Tesco toilets accessible. • Lack of trespass guards. • Uneven steps on railway bridge that could cause trip hazard. • Walking route from southbound platform is steep and narrow for pushchairs/wheelchairs (Access for All scheme is responding to this).

Wales and Borders

		• Sheltered seating. • Tidy • Accessible with one lift, Access for All scheme installing second lift to replicate accessibility. • Good onward travel connectivity.	**Recommendations:** Installation of trespass guards, particularly as the Marches line sees high levels of anti-social behaviour. De-vegetation along the southbound platform walking route to improve access.
Craven Arms 	1) ☒ 2) ☒ 3) ☒	• Car park (though not large). • Decent signage towards town centre with active travel routes • Up to date timetable information • Short walk to community centre • Disabled bays • Sheltered seating • Good signage • Well-maintained	• Lack of trespass guards, particularly with station being near a housing estate and evidence of anti-social behaviour during site visit. • No toilets, though short distance to community centre. • Long walk between platforms if requiring a step-free route. **Recommendations:** Installation of trespass guards.
Church Stretton 	1) ☒ 2) ☒ 3) ☒	• Disabled spaces • Car park • Sheltered seating • Well-maintained • Ticket machines • Local public transport information • Good onward connectivity	• Not accessible • Car park is small and paid for • Limited seating **Recommendations:** In line with survey feedback, additional seating would be beneficial.
Shrewsbury/Amwythig 	1) ☒ 2) ☒ 3) ☒	• Café with hot food and drinks options • Toilets • Sheltered seating • Waiting rooms • Staffed	• Poor interchange into platform 3 • Lack of wayfinding and information points around the station • General cleanliness could be improved. • Better car parking provision needed. **Recommendations:** Better provision of passenger information and more wayfinding points at the station would be

			beneficial, particularly with the difficult interchange at platform 3. A quick win would be better general upkeep of the station, whilst a more intensive proposal would be better provision of car parking; a park and ride option could be advisable as this would respond to markets further afield as well as local demand.
Yorton 	1) ☒ 2) ☒ 3) ☒	• Limited parking available • Limited cycle parking	• Step-free access is available to platform 2, however access to platform 1 is not accessible and travelling between the platforms involves a long detour via a narrow country lane. • No sheltered seating. **Recommendations:** Better provision of seating with shelters would make for a better passenger experience.
Wem 	1) ☒ 2) ☒ 3) ☒	• Step-free access to both platforms • Sheltered seating • Car park • Cycle storage • Good bus links	• Limited accessible parking – one space only • Limited seating and shelter. **Recommendations:** The provision of additional seating and shelter would be beneficial, as would the provision of more accessible spaces given that Wem's neighbouring station at Yorton has limited step-free access and Prees does not have a car park.
Prees 	1) ☒ 2) ☒ 3) ☒	• Sheltered seating • Step-free access to both platforms • Notice boards with local information • Cycle storage	• No car park • No clear pedestrian path access from main road on the station **Recommendations:** The provision of better signage would be helpful for pedestrians to understand the best walkways and cycleways from the station. Additional sheltered seating would also be useful.

Wales and Borders

Whitchurch 	1) ☒ 2) ☒ 3) ☒	• Sheltered seating • Car park with accessible spaces • Cycle storage • Good access to town centre for pedestrians/cyclists	• Current step-free access is only available via platform 2. Platform 1 cannot be accessed without use of a footbridge. • No clear bus links. **Recommendations:** Whitchurch is proposed for development as an Access for All Scheme in CP7; this development is crucial to ensuring that all users can access both directions of travel.
Wrenbury 	1) ☒ 2) ☒ 3) ☒	• Step-free access to both platforms • Sheltered seating	• No cycle storage. • No car park. • Access between platforms via level crossing. • No clear pedestrian walkways to/from station. **Recommendations:** There is a business park located behind the station which is likely a place of employment for many; better pedestrian access between the business park and station would be advisable to avoid sending pedestrians onto the main road, or better signage to indicate where easy links between the two exists.
Nantwich 	1) ☒ 2) ☒ 3) ☒	• Step-free access to both platforms. • Central to local housing • Sheltered seating • Cycle spaces • Good active travel options • Local businesses nearby	• No station car par • Limited seating. • Step-free route between platforms is via a level-crossing. **Recommendations:** The provision of additional sheltered seating would be beneficial as there are numerous local housing areas and businesses within walking distance of the station.

Wales and Borders

Crewe 	1) ☒ 2) ☒ 3) ☒	• Staffed • Accessible • Car parks • Toilets • Waiting rooms • Sheltered seating on platforms • Café with hot and cold refreshments • Shops • Cycle spaces • Good onward connectivity	• Some gateline congestion has been identified. **Recommendations:** With the likelihood of additional services through Crewe in the future and the potential for changes in the station area to improve capacity as part of North West & Central work, it is advisable to develop the identified gateline issues and understand solutions.
Ruabon 	1) ☒ 2) ☒ 3) ☒	• Good access to town centre. • Good bus links. • Sheltered seating. • Good upkeep.	• Not clear how you access the platform, lack of signage. • No secure cycle parking. **Recommendations:** Access to key institutes from Ruabon is crucial (a secondary school is directly accessible from the station) however there is no clear signage; the provision of better signage and wayfinding points is recommended. Secure cycle parking spaces is also advisable to promote active travel and use of the routes from the station.
Chirk 	1) ☒ 2) ☒ 3) ☒	• Good access to town centre, including good bus links. • Good walking route to the station, although narrow pavements. • Sheltered seating. • Good upkeep.	• No toilets • Train information is not situated on platform. • Reasonably accessible, difficult to navigate. **Recommendations:** Two factories are situated nearby which provide significant employment opportunities, therefore connectivity to the station is important. Some consideration should be given to improving the approaches; de-vegetation and potentially widening of footpaths. Given the good active travel access, additional secure cycle parking would be helpful.

Wales and Borders

Gobowen 	1) ☒ 2) ☒ 3) ☒	• Café with hot and cold food options available. • Heritage railway attraction at station. • Sheltered seating available. • Waiting room. • Toilets.	• Level crossing at station imposes difficulty with timings; train missed if you're not on the right side and could pose significant safety issues. • Upkeep could be improved. • Limited public transport options. • Limited car parking. **Recommendations:** With the potential for a connection between Gobowen – Oswestry, additional parking and transport links would be advisable. Investigation of level crossing improvements or better access to the station would be recommended to be developed.
Wrexham General 	1) ☒ 2) ☒ 3) ☒	• Sheltered seating • Waiting rooms • Café with hot and cold food options • Toilet available (accessible) • All platforms have step-free access.	• Only one unisex toilet at station, plus an accessible toilet. • No secure cycle storage. • Bus stop at the train station that isn't used due to buses not being able to use the turning circle. • No step-free access to station entrance on Platform 4. **Recommendations:** As a key hub along the Marches, Wrexham General should have better provision of toilet facilities. Wrexham Council have designed a cycle path and walkway as connectivity to the station, therefore additional secure cycle storage would be advisable.
Chester 	1) ☒ 2) ☒ 3) ☒	• Staffed • Accessible • Car parks • Toilets • Waiting rooms • Sheltered seating on platforms • Café with hot and cold refreshments • Shops • Cycle spaces • Good onward connectivity	• A small gate on the existing footbridge notably creates a pinch point. **Recommendations:** Re-grading the footbridge to remove the change in level and the need for gate; heavy footfall at Chester could continue to cause issues here if not addressed.

Wales and Borders

Do the Marches stations respond well to accessibility requirements?

The Marches corridor is step-free at some stations, primarily at key hubs such as Hereford and Shrewsbury. Some stations (as outlined in the table above) have step-free access to one platform, and others only have step-free access between platforms via a long route outside the station.

Significant work is underway to respond to national accessibility requirements and provide appropriate inclusion for those needing step-free access to Marches stations. Network Rail is undertaking delivery of the Department for Transport's (DfT) Access for All (AfA) programme that includes several stations along the corridor, transforming usage for those users.

The programme aims to provide an unobstructed and obstacle free 'accessible route' from the principle drop off point at the station, to and between operational platforms. As well as addressing physical obstruction, the scope includes improving lighting, PA and CCTV coverage along the accessible route which are all part of creating an accessible environment at the station. The 'accessible route' must satisfy all applicable requirements of the DfT's Design Standards for Accessible Railway Stations (March 2015), except where prior dispensation has been agreed.

Cwmbran, Abergavenny and Ludlow are all currently in the delivery phase. New footbridges are being installed at both Cwmbran and Abergavenny, the latter receiving the only existing covered 'Beacon' footbridge nationally. At Ludlow, the project team is installing an additional lift as one platform currently has a lift, whilst the other does not; this has been remedied as part of the AfA scheme.

Ruabon and Whitchurch have also been identified as two of the four Wales AfA schemes selected by the DfT for initial feasibility work to determine deliverability, cost and programme to deliver. These will be progressed as part of CP7.

When these AfA schemes are delivered, only Yorton will have a platform which can't be accessed via a step-free route. Some of the other stations will retain lower quality step-free routes with either long distances to cover outside the station or other non-compliances.

What are the new station proposals for the Marches line and what impact could this have?

Discussions with stakeholders has demonstrated that there are numerous aspirations for new stations along the corridor. Stakeholders advised that the provision of an additional station (at a given location) would cater to market demand that is currently not captured by the services and locations of stations along this north-south corridor. Station proposals to the south include Caerleon Llantarnam and Sebastapol with Pontrilas further toward Hereford. North of Shrewsbury include aspirations at Baschurch and both Wrexham North and South.

The advanced timetable team have undertaken an assessment that looks at the provision of a single additional station between Newport and Shrewsbury (to respond to the numerous aspirations along this section of geography). The purpose of carrying out this analysis is to understand the impact of a single additional station on the existing December 2023 timetable (as a stakeholder aspiration). The work then looks at the impact of an additional station against ITSS 3 to understand whether a new station would align with longer-term aspirations. These scenarios use the Class 197 as the fleet operating the proposed services.

December 2023 scenario

For the purpose of this high-level analysis, we have used Caerleon as a theoretical location of an additional station and the proposal is 1tph at this location. No business case work has been undertaken and if this station were to progress in the future, the first stage would be to investigate its strategic and economic case and carry out early feasibility.

This work tests a scenario in which the existing Manchester services include this stop, as part of the baseline December 2023 assessment. The detail of this is available for stakeholder review in a separate report. Further work will be required to progress any such proposal and this scenario is exploratory only.

In the Southbound direction (validated between Crewe and Newport), a 1tph stop was successfully added to the existing Manchester service. The addition of this stop on the Manchester service required changes to pathing time along the train's journey, as well as the resolution of junction margin conflicts. One service (departing Crewe at 11:10) was subject to a nine-minute increase in journey time due to dwell time increases to facilitate the additional stop, however most other services had unchanged arrival and departure times or very minor changes.

In the Northbound direction (validated between Newport and Crewe), the team were also able to successfully add the additional stop for a 1tph pattern. As with the Southbound direction, the inclusion of this station requires the flexing of some services as well as some changes to dwell times. The 13:03 Newport departure specifically required some platforming and dwell time amendments at Shrewsbury. The majority of services were subject to unchanged arrival and departure times, however some services imported additional dwell time and minor time changes.

No infrastructure interventions would be triggered by including this additional stop on the existing Manchester services, however some Cardiff - Manchester services would have longer journey-times as a result of this additional call (as set out above).

It is relevant to note that any changes to dwell times or flexing of trains would require further work to understand any performance impact that this scenario may create.

ITSS 3 scenario

For the purpose of this analysis, a 1tph stop at Caerleon is included as part of the proposed Cardiff – Shrewsbury stopper service (proposed as part of ITSS 3). Further work will be required to progress any such proposal and this scenario is exploratory only.

A stop at Caerleon as part of this proposed hourly service was successfully added in the Northbound direction, however the services have been validated from or until Maindee North Jn only (from Maindee North Jn to Shrewsbury in this section). With the exception of one path requiring 30 seconds pathing allowance at Pontrilas and another requiring 30 seconds extra dwell at Craven

Wales and Borders

Arms, no further pathing allowances were required. The first service mentioned required 30 seconds of pathing allowance in order to avoid the absolute block conflict at Tram Inn and the second required the allowance of 30 seconds extra dwell at Craven Arms to avoid the absolute block conflict at Marsh Brook level crossing.

In the Southbound direction, the services have been validated from or until Maindee North Junction only (from Shrewsbury to Maindee North Jn in this section).

1C10CD at 10:59 has a pathing allowance of one minute and 30 seconds at Sutton Bridge Jn and a minute at Tram Inn, both to avoid the AB conflict. Like the previous path, 1C12CD at 12:59 also has one minute and 30 seconds pathing at Sutton Bridge Jn to avoid the AB conflict. 1C13CD also has pathing allowance at Sutton Bridge Jn but for just 30 seconds. 1C14CD starting at 15:05, didn't require any pathing allowance throughout the journey. The train path 1C11CD, has an absolute block conflict at Pontrilas, but this has not been analysed further as it will be using the proposed signal (as part of the infrastructure enhancement for ITSS 3) between Pontrilas and Abergavenny in the down direction.

It is relevant to note that any changes to dwell times or flexing of trains would require further work to understand any performance impact that this scenario may create.

What are the existing workstreams that are likely to facilitate improvements at stations?

A wholesale transformation of Hereford station is likely in the near future. Herefordshire County Council have consulted a masterplan[16] for the city that includes development of the station and providing better connectivity from the station to other locations in the city. The council was successful in obtaining Levelling Up funding that will be used for the scheme.

The transformation of the forecourt which will provide a new waiting area, driver facilities, toilets and an active travel hub that will provide green spaces and excellent connectivity for bus users, pedestrians, and cyclists. This is likely to provide great benefit to passengers as Hereford is an educational hub for students from the surrounding areas and a new 'plaza' type area will provide students with the green space and onward connectivity options previously lacking.

Similarly, Transport for Wales has recently undertaken some Chester station improvements[17] that have responded to previous identified issues at the station. An upgrade and extension of the main gateline was completed, providing easier access and less congestion for passengers. The work also included new branding and signage for better wayfinding, , cycle stands, a new station CCTV system, toilets refurbishments on both the concourse and platforms, a new changing place toilet and other passenger experience upgrades such as a waiting room upgrade and improvements to concourse seating.

[16] Herefordshire Council – Herefordshire Council
[17] Chester station improvements | Transport for Wales (tfw.wales)

Wales and Borders

What are we proposing?

What is the answer to the headline question? "How can the Welsh Marches line and the Shrewsbury – Chester line accommodate stakeholder aspirations that best support sustainable economic and social growth in Wales and borders?"

Understanding how the railway in this corridor is used has allowed us to surmise that targeted improvements will better support the Marches' key markets. A healthy proportion of growth is already anticipated for this geography and the demonstrable housing growth forecasted will create increased demand for travel to key hubs both along the corridor and externally, as identified within the study. The levels of growth captured in this study often match or surpass the national projections and therefore a service that offers reliability, comfort and onward connectivity is key to enabling these levels of growth to continue.

As the primary passenger group in this area, supporting leisure travel with the provision of attractive stations and rolling stock will be vital in prompting repeat travel from this group and bolstering tourism at locations along the route. Meanwhile, the retention of the commuter market will also be vital and therefore a reliably performing railway with better long-term frequency and journey times to key business and educational hubs such as Cardiff, Manchester, and Liverpool externally as well as Wrexham, Shrewsbury and Hereford within the Marches geography will be crucial.

The analysis carried out as part of this study has also identified that currently capacity constraints are present on certain services and therefore the continued improvement of rolling stock, offering more seating and more carriages is highly recommended. The segregation of markets will also be key in addressing capacity issues by separating long-distance passengers and short-distance passengers. This segregation will also attract passenger growth as connectivity to main hubs, particularly Manchester will be faster and more accessible.

The study has also identified the significance of road vehicles in providing connectivity to the Marches stations. To promote modal shift and respond to markets outside a standard station catchment area, it is advisable to provide alternative first mile and last mile options, through identifying appropriate park and ride locations, as well as furthering active travel links and providing smooth transition options for continued travel by bus, in the first instance by ensuring the right wayfinding for onward connectivity is present at stations. Freight will also play a key role in working towards modal shift, reducing vehicle emissions and road congestion by using rail instead of road; retaining and allowing growth for freight paths in the future is integral to boosting economic growth along the corridor and achieving social betterment with a greener environment.

Building on the good work being done or being planned will also be vital over the coming years; supporting the Network Rail performance team and local signallers in recognising wider infrastructure improvements will be integral to realising reliability, and identifying appropriate long-term solutions for weather resilience by working with our asset teams to provide solutions for bettering historically weather-impacted infrastructure is key. Network Rail can also work collaboratively with key stakeholders to align our projects, reduce duplication and ensure that the Marches functions as a network of travel options for our customers that will support the anticipated social and economic growth in the area.

Wales and Borders

Study Choices for Funders - Summary	Type P = Passenger F = Freight	Next Steps
How can the Marches line best support its key markets, taking cognisance of post-covid behaviour and demand growth in the study area? *How can we make best use of the Marches infrastructure? How can infrastructure changes support future aspirations for the line?*		
The study proposes several service enhancements, including aspirations made by stakeholders along the corridor, addressing market demands as identified by economic analysis and taking cognisance of passenger feedback. Key service choices for funders are as follows: • Connectivity to Liverpool (ITSS 2) supports a market-led approach, addressing a connectivity gap previously identified and recognised in this study and should be developed. • Segregation of the short- and long- distance markets is vital to respond to journey-time improvement aspirations as well as better frequency for smaller Marches stations (ITSS 3) and should be developed. • Additional services to Wrexham will support numerous markets and offer improvements for education and tourism (ITSS 4 and 5) and should be developed. • Additional services into the Marches from external destinations such as Birmingham and London (ITSS 2, 4 & 5) would provide better all-around connectivity options and should be developed. • Freight plays a key role in driving modal shift and our freight targets highlight the significance of future growth and allowing for such; the provision of an hourly path (ITSS 4) should be developed. • An additional service to Abergavenny is able to run alongside the aforementioned service enhancements and should be developed. Key considerations include: • A trade-off will likely be required between the proposed ITSS 4 service extension from Crewe – Chester – Wrexham and the proposed ITSS 5 service extension from Leeds – both services cannot run concurrently without wholesale redoubling of the line between Rosset junction and Chester – a significant intervention that is unlikely to be warranted by one additional service proposal. • A trade-off will likely be required for heavy freight traffic hours and the level of journey-time improvement offered on Cardiff – Manchester services.	P, F	Further develop service improvements with stakeholders; inform future strategic planning work.
The study identifies new and previously proposed rail system interventions for improved infrastructure, designed to deliver the ITSS phases, featuring both capacity and resilience benefits. Key infrastructure choices for funders are as follows: • Signalling intervention on the WSJ2 near Gobowen (to facilitate Cardiff – Liverpool services) • Signalling interventions on the HNL1 (to facilitate journey time improvements for Cardiff – Manchester plus stopper service and	P, F	Undertake feasibility studies on new interventions and inform cases for existing proposed interventions (Shrewsbury platform 3, Gobowen), understand more detailed level crossing impact and

Wales and Borders

Study Choices for Funders - Summary	Type P = Passenger F = Freight	Next Steps
accommodate existing freight paths, as well as improve performance) • Shrewsbury platform 3 reconfiguration (to allow for three no. future service proposals and generalised performance improvements) • Signalling interventions on the SHL (to facilitate an hourly freight path) • Level crossings interventions, as required upon further development. Other considerations: • Whilst the study recognises the North Wales Transport Commission aspiration for redoubling between Wrexham and Chester, the cost associated with the intervention does not (at the high-level look carried out by this study) demonstrate a reasonable return on service opportunities for the line, given that further work would be required to facilitate the two services proposed in ITSS 5 (Chester extension to Shrewsbury and Leeds extension to Wrexham) at one time along the redoubled corridor. It would be prudent, however, to investigate this intervention in more detail before either proceeding to a recommendation or wholly discounting this proposal.		intervention requirements.
The study recommends further investigation of the following to complement the proposed service enhancements and infrastructure interventions: • Capacity improvements at Chester and Crewe • Investigation of re-timing requirements created by the service enhancements. • Understand and improve interchange times for services at Shrewsbury. • Consider bi-directional working options to respond to lack of flexibility on the route. • A turnback facility at Abergavenny. • Build on existing workstreams (renewal plans, weather resilience, AfAs) to respond to long-term strategic goals. • Continue the work of the Wales Route Timetable Taskforce, using the knowledge and experience within the group to fully assess the proposals and determine whether (any) ITSS phase imports any performance risk and how this should be mitigated.	P. F	Consider implications and options as part of development studies, understand progress on existing Chester and Crewe capacity studies and choices for funders, stakeholders to support Transport for Wales with progressing the feasibility study for an Abergavenny turnback facility.
What is the role of rail in the Marches corridor in supporting the roadmap to net zero?		
The study recommends the development of *First & Last Mile* opportunities, which are as follows: • Park and Ride options for passengers outside standard station. catchment areas to reduce travel by private vehicle. • Support station masterplans at Hereford, Shrewsbury, Newport and Wrexham that provide better bus links and cycle options.		Review and prioritise opportunities in the corridor with stakeholders to understand where further support for development of existing

Wales and Borders

Study Choices for Funders - Summary	Type P = Passenger F = Freight	Next Steps
• Minor station improvements to promote active travel as set out in sub-question 4.		proposals is required, understand opportunities for 'quick wins' as set out in sub-question 4, conduct feasibility studies for park and ride location opportunities.
The study recommends understanding intermediary options for electrification to meet forthcoming net zero targets, with a view to achieving full electrification consistent with Regional Decarbonisation Strategy findings	P, F	To be developed through Regional Decarbonisation Strategy updates and in conjunction with local asset teams
Study recommends that future passenger and freight rolling stock programmes should reflect Regional Decarbonisation Strategy proposals	P, F	To be developed through Regional Decarbonisation Strategy updates, in conjunction with our stakeholders
How can stations on the Marches be made fit for the future?		
The study recommends station improvements at all stations, as set out in sub-question 4.		Work with stakeholders to understand options to address 'quick win' scenarios
The study recommends that new station proposals take cognisance of the train service specifications proposed, as well as key facility requirements at stations.		Work with stakeholders to support new station feasibility studies.

Table 22 – Choices for funders

What are the next steps?

In order to deliver the service improvements within the ITSS phase proposal, a number of strands of development will need to be pursued. Development and feasibility studies to further develop the interventions identified in this study will be required, and detailed cost and optioneering for this incremental phasing will need to be key priorities in any such further development work.

The case for investment will need to consider other separate but related work that is already underway, such as Network Rail's accessibility and weather resilience workstreams, Transport for Wales's rolling stock transformation programme and other feasibility studies such as the Abergavenny turnback proposal and service options for accelerating Manchester services. It will also need to align with interfacing existing improvement projects such as Midlands Rail Hub, the Gobowen-Oswestry proposal, and the creation of new freight connections by integrating their outputs with the wider Marches corridor vision.

The close engagement established with partner organisations internal and external to the rail industry should continue, particularly surrounding the development of any singular or multiple

enhancement proposals. An addendum to this survey may also be appropriate to ensure that the proposed choices for funders remain applicable and respond correctly to market demand. Long-term rail and investment strategies should seek to incorporate these proposals as much of the enhancement aligns with existing stakeholder aspirations and in some cases, existing workstreams such as the Midlands Connect Access to Rail programme and Monmouthshire County Council's local development plan for Abergavenny station links.

New station aspirations should not be forgotten, as they are numerous within this geography. Each new station proposer should consider the outputs of this study, specifically the long-term service aspirations set out herewith, and the limitations of the existing infrastructure. Although aligning the long-term strategy is palatable, it is also acknowledged that the proposed enhancements rely on significant infrastructure interventions in some cases, and any new station proposal should not be postponed by uncommitted future works.

There is ample work to progress with on this corridor that is of real social and economic value to its passengers and stakeholders; it is our role to ensure the strategic importance of the Marches is not lost on the journey to a sustainable, better network.

Wales and Borders

APPENDICES

Appendix 1 – Extract of freight services from weekday schedules

Route	Origin	Work Dep	Destination	Work Arr	Days	TOC
Crew - Shrew, Shrew - Chester	Coton Hill TC GBRf	10:59:00	Penyffordd Cement GBRF	12:20:00	EWD	GB Railfreight
Crew - Shrew, Shrew - Chester	Donnington RFT	13:32:00	Arpley Sidings	15:45:30	TThO	DB Cargo
Crew - Shrew, Shrew - Chester	Coton Hill TC GBRf	10:53:00	Bescot Yard	12:07:00	SX	GB Railfreight
Crew - Shrew, Shrew - Chester	Basford Hall S.S.M.	10:20:00	Donnington RFT	11:56:00	SX	Network Rail Virtual Freight Company
Crew - Shrew, Shrew - Chester	Penyffordd Cement GBRF	13:00:00	Coton Hill TC GBRf	15:50:00	EWD	GB Railfreight
Crew - Shrew, Shrew - Chester	Tinsley Yard GBRf	10:51:00	Coton Hill TC GBRf	15:53:00	SX	GB Railfreight
Crew - Shrew, Shrew - Chester	Acton Yard GBRF	10:14:00	Coton Hill TC GBRf	15:53:00	SX	GB Railfreight
Crew - Shrew, Shrew - Chester	Donnington RFT	12:31:00	Southampton W.Docks (GBRF)	22:36:30	TSX	GB Railfreight
Crew - Shrew, Shrew - Chester	Donnington RFT	12:31:00	Mossend Down Yard GBRF	21:48:30	FSX	GB Railfreight
Crew - Shrew, Shrew - Chester	Kineton MOD GBRf	07:10:00	Donnington RFT GBRf	12:53:30	FSX	GB Railfreight
Crew - Shrew, Shrew - Chester, Marches	Avonmouth BBHT Coal Silos	10:52:00	Basford Hall S.S.M.	15:35:30	SX	Network Rail Virtual Freight Company
Crew - Shrew, Shrew - Chester, Marches	Portbury Coal Terminal FHH	05:59:00	Basford Hall S.S.M.	11:30:00	SX	Network Rail Virtual Freight Company

Wales and Borders

Crew - Shrew, Shrew - Chester, Marches	Portbury Coal Terminal FHH	08:06:00	Basford Hall S.S.M.	13:53:00	SX	Network Rail Virtual Freight Company
Crew - Shrew, Shrew - Chester, Marches	Llanwern Exchange Sdgs	08:18:00	Crewe Bas Hall S.S.N.	12:47:00	TWThO	Network Rail Virtual Freight Company
Crew - Shrew, Shrew - Chester, Marches	Dee Marsh Recp GBRf	09:31:00	Margam TC GBRF	17:35:00	SX	GB Railfreight
Crew - Shrew, Shrew - Chester, Marches	Dee Marsh Recp GBRf	09:31:00	Margam TC GBRF	19:38:00	SX	GB Railfreight
Crewe - Shrew	Wellingborough Up TC GBRf	09:11:00	Llandudno Jn TC GBRf	14:45:00	SX	GB Railfreight
Crewe - Shrew	Crewe C.S. (L&NWR Site)	11:11:00	Basford Hall S.S.M.	11:48:00	SX	Freightliner Heavy Haul
Crewe - Shrew	Small Heath LaFarge GBRf	10:35:00	Hindlow GBRF	17:05:00	SX	GB Railfreight
Crewe - Shrew	Southampton W.Docks (GBRF)	05:24:00	Ditton (O'Connor) GBRf	14:46:00	SX	GB Railfreight
Crewe - Shrew	Chirk Kronospan (AMEC)	06:57:00	Hellifield Goods Loop	13:57:00	SX	Colas Rail
Crewe - Shrew	Longtown MOD GBRf	09:20:00	Kineton MOD GBRf	18:09:00	TThO	GB Railfreight
Crewe - Shrew	Crewe Bas Hall L.H.S.	10:05:00	Longport LR Colas	11:59:00	SX	Colas Rail
Marches	Basford Hall S.S.M.	08:19:00	Stoke Gifford FHH	11:55:00	MSX	Freightliner Heavy Haul
Marches	East Usk Yard (FHH)	12:23:00	Moreton-on-Lugg (FLHH)	14:11:00	SX	Freightliner Heavy Haul
Marches	Westbury Tarmac	12:16:00	Tunstead Sdgs	21:11:00	SX	Freightliner Heavy Haul

Wales and Borders

Marches	Bicester MOD GBRf	07:38:00	Donnington RFT GBRf	14:31:00	FSX	GB Railfreight
Marches	Margam TC GBRF	10:22:00	Dee Marsh Recp GBRf	18:48:00	SX	GB Railfreight
Marches	Ernsettle MOD GBRf	10:12:00	Glen Douglas MOD GBRf	33:12:30	FSX	GB Railfreight
Marches	Toton North Yard	08:30:00	Moreton-on-Lugg (FLHH)	16:27:00	TThO	Freightliner Heavy Haul

Appendix 2 – Table showing projected demand forecast based on the Demand Driver Generator (DDG), local housing and the projected difference.

Station	DDG Forecast	DDG + Local Plan	Difference
Leominster	25%	25%	0.0%
Church Stretton	28%	31%	3.3%
Pontypool and New Inn	27%	27%	0.0%
Yorton	23%	23%	0.0%
Hereford	24%	24%	-0.2%
Crewe	31%	31%	0.0%
Wrexham General	27%	36%	9.8%
Ruabon	28%	29%	1.0%
Ludlow	28%	33%	4.5%
Craven Arms	28%	40%	12.4%
Chirk	28%	28%	0.0%
Wem	26%	32%	6.3%
Shrewsbury	28%	30%	2.6%
Gobowen	28%	28%	0.0%
Abergavenny	26%	34%	7.6%
Chester	26%	26%	0.0%
Whitchurch (Salop)	27%	28%	1.0%
Newport (Gwent)	31%	31%	0.0%
Nantwich	27%	27%	0.0%
Cwmbran	28%	28%	0.0%
Prees	25%	26%	1.4%
Wrenbury	27%	27%	0.0%

Wales and Borders

Appendix 3 – Summary of linespeed changes for loco-hauled units post removal of Permanent Speed Restrictions (PSR).

SHL

Up side Mileage	Extent	Up speed (current)	Up speed (proposed)
3m10ch – 5m05ch	1m 75ch	70/90MU	70/90
5m05ch – 5m25ch	20ch	65/75MU	65/75
5m25ch – 6m20ch	75ch	70/85MU	70/85
6m 47ch - 7m42ch	1m 75ch	70/90MU	70
9m39ch – 11m02ch	1m 42ch	70/80MU	70/80
11m02ch – 14m72ch	3m 70ch	70/90MU	70/90
11m72ch – 16m42ch	4m 50ch	70/80MU	70/80
16m42ch – 18m10ch	3m 48ch	70/90MU	70/90
18m62ch - 20m38ch	1m 56ch	75/90MU	75/90
20m38ch - 21m0ch	42ch	65/75/90MU	75/90MU
21m0ch – 22m07ch	1m 7ch	75/90MU	75/90

Table 23

Down side mileage	Extent	Down speed (current)	Down speed (proposed)
3m10ch – 5m06ch	1m 76ch	70/80MU	70/75
5m06ch – 5m26ch	19ch	50/75MU	50/70
5m26ch – 10m38ch	5m 12ch	70/80MU	70/80
10m38ch-11m02ch	44ch	70/85MU	70/85
11m02ch – 14m72ch	3m 70ch	70/90MU	70/90
11m72ch – 16m42ch	4m 50ch	70/80MU	70/80
16m42ch – 17m30ch	78ch	70/90MU	70/90

Table 24

SYC

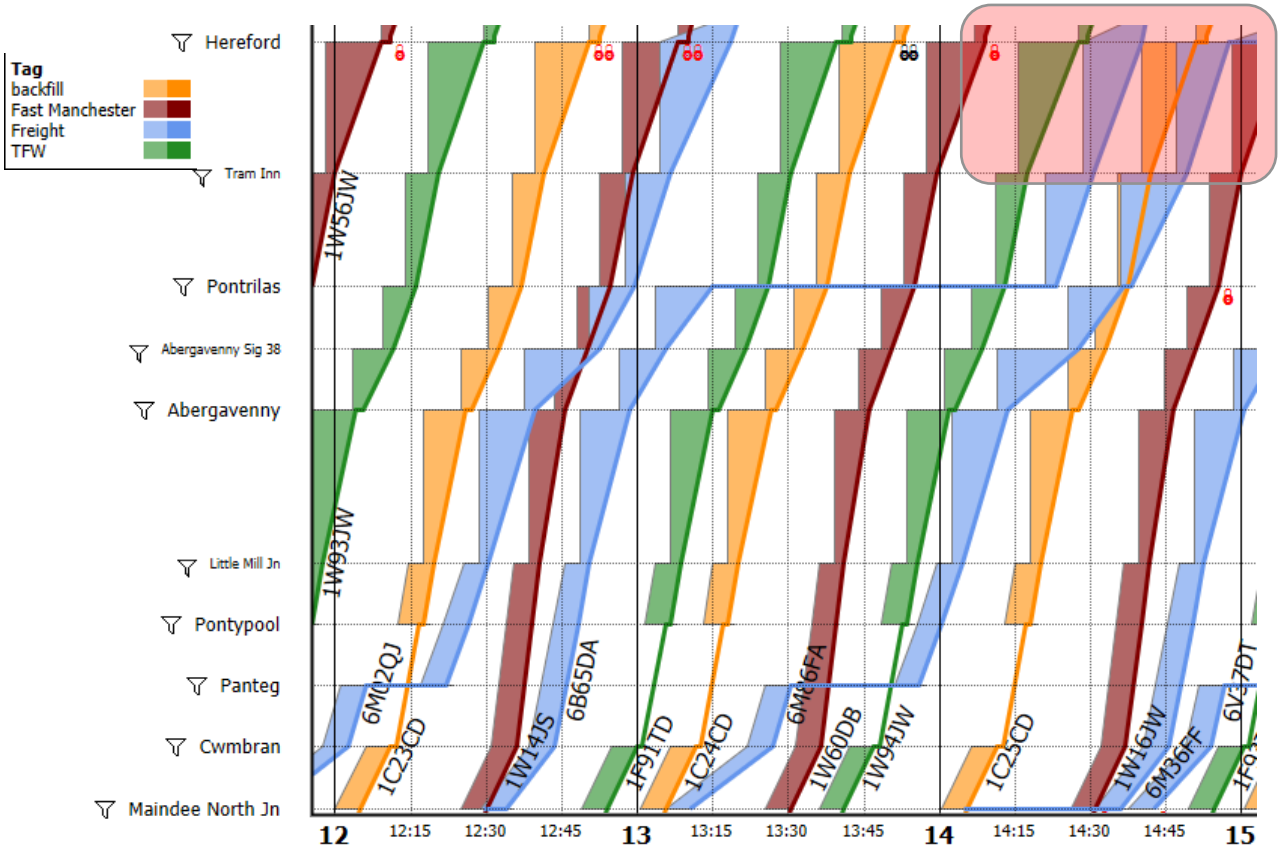
Up side Mileage	Extent	Up speed (current)	Up speed (proposed)
4m 53ch - 13m 06ch	8m 53ch	70/90MU	70/90
13m 53ch – 28m 75ch	15m 22ch	70/90MU	70/90
28m 75ch - 30m 20ch	1m 25ch	70/90MU	70/85
31m 07ch – 31m 74ch	67ch	40/70MU	40/70

Table 25

Down side milage	Down speed (current)	Down speed (proposed)
4m 53ch - 13m 06ch	70/90MU	70/90
13m 53ch – 30m 20ch	70/90MU	70/90

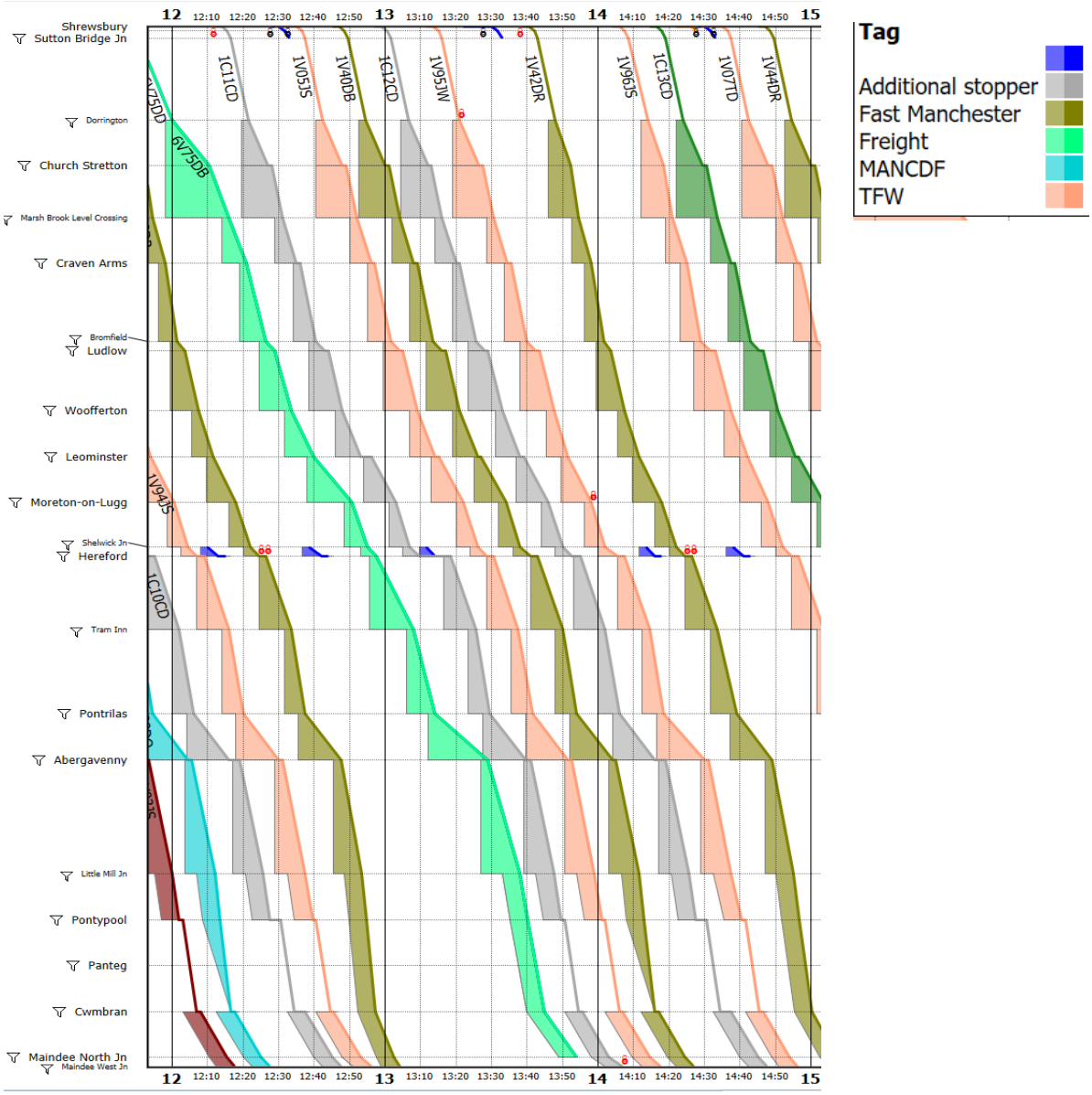
Appendix 4

a) Train graph depicting each signal block between Maindee North Junction and Hereford



Wales and Borders

b) – Train graph depicting southbound issues between Abergavenny and Pontrilas



Wales and Borders

Appendix 5
ECONOMIC ANALYSIS METHODOLOGY

- ATT provided the timetable input for each of the options.
- These inputs were then run through MOIRA 2 modelling package.
- The analysis is focused on the key flows as identified in the first phase of this study.
- High level appraisal has been undertaken over 60 years period.
- Only journey time benefits and revenue uplift included in the analysis.
- CAPEX information is based on order of magnitude cost advice provided by internal Network Rail cost planners.
- OPEX information is based on a high-level assumption of £1.5m per annum to operate an extra rolling stock diagram.
- Freight benefits will be quantified using Marginal external cost modelling using the information provided by ATT.
- The output from the appraisal will be assessed against the criteria based on the objectives of this study.

Key flows
Chester - Shrewsbury
Hereford - Leominster
Hereford - Ludlow
Ludlow - Shrewsbury
Crewe - Shrewsbury
Abergavenny - Hereford
Hereford - Shrewsbury
Church Stretton - Shrewsbury
Abergavenny - Newport (Gwent)
Shrewsbury - Wem
Gobowen - Shrewsbury
Shrewsbury - Wrexham General
Chester - Gobowen
Shrewsbury - Whitchurch (Salop)
Hereford - Newport (Gwent)
Cwmbran - Shrewsbury
Cwmbran - Hereford
Craven Arms - Shrewsbury
Crewe - Nantwich

Wales and Borders

Appendix 6

a) – Timetable depicting proposed timings for the Cardiff – Abergavenny service (in December 2023 scenario)

			1	2	3	4	5	6
Formed By								
Signal ID			**1W07MI**	**1W08MI**	**1W06MI**	**1W14MI**	**1W09MI**	**1W10MI**
Orig. Dep. Time			10.12	11.21	12.28	13.29	14.33	15.36
Orig. Loc. Name			Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central
Dest. Loc. Name			Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny
Timing Load			**197**	**197**	**197**	**197**	**197**	**197**
Operating Characteristics								
TOC			HL	HL	HL	HL	HL	HL
Day of Operation			**SX**	**SX**	**SX**	**SX**	**SX**	**SX**
Changes To Form			New	New	New	New	New	New
Cardiff Central	plt	1	2	1	3B	4B	2	0
	dep	2	**10.12**	**11.21**	**12.28**	**13.29**	**14.33**	**15.36**
	dep-line	3	B	B	D	E	B	B
Long Dyke Jn		4	*10/14½*	*11/23½*	*12/30*	*13/31*	*14/36*	*15/39*
	dep-line	5	ML	ML	RL	RL	ML	ML
	mgn	6	[1],(1½)	[1]	[1],(1)	[1],(½)	[1]	[1]
Marshfield		7	*10/21*	*11/28½*	*12/39½*	*13/40*	*14/41*	*15/44*
	dep-line	8	ML	ML	RL	RL	ML	ML
Ebbw Jn		9	*10/23½*	*11/31*	*12/43½*	*13/44*	*14/43½*	*15/47½*
	dep-line	10	ML	ML	ML	ML	ML	ML
Gaer Jn		11	*10/25*	...	...	...	...	...
	dep-line	12	RL	...	...	...	...	...
Newport (South Wales)		13	*10/27*	*11/34*	*12/47*	*13/47*	*14/47*	*15/50*
	plt	14	URL	4	4	4	4	4
	dep-line	15	RL	ML	ML	ML	ML	ML
Maindee West Jn		16	*10/28*	*11/35*	*12/48*	*13/48*	*14/48*	*15/51*
Maindee North Jn		17	*10/30*	*11/37*	*12/50*	*13/51*	*14/50*	*15/53*
	mgn	18	(6)	...	(2)	(1)	(5)	...
Little Mill Jn		19	*10/46½*	*11/47½*	*13/02½*	*14/02½*	*15/05½*	*16/03½*
	mgn	20	{3}	{3}	{3}	{3}	{3}	{3}
Abergavenny	arr	21	**10.56**	**11.57**	**13.12**	**14.12**	**15.15**	**16.13**
	plt	22	1	1	1	1	1	1

Wales and Borders

b) – Timetable depicting proposed timings for the Abergavenny – Cardiff Central service (in the December 2023 scenario)

			1	2	3	4	5	6
Formed By								
Signal ID			**1Y01MI**	**1Y02MI**	**1Y03MI**	**1Y04MI**	**1Y05MI**	**1Y06MI**
Orig. Dep. Time			10.22	11.59	12.23	13.21	14.27	15.22
Orig. Loc. Name			Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny
Dest. Loc. Name			Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central
Timing Load			**197**	**197**	**197**	**197**	**197**	**197**
Operating Characteristics								
TOC			HL	HL	HL	HL	HL	HL
Day of Operation			**SX**	**SX**	**SX**	**SX**	**SX**	**SX**
Changes			New	New	New	New	New	New
To Form								
Abergavenny	plt	1	2	2	2	2	2	2
	dep	2	**10.22**	**11.59**	**12.23**	**13.21**	**14.27**	**15.22**
	mgn	3	(1)	(½)	(½)	...	...	...
Little Mill Jn		4	*10/30*	*12/06½*	*12/30½*	*13/28*	*14/34*	*15/29*
	mgn	5	(2)	(1)	(1)	...	...	...
Maindee North Jn		6	*10/39*	*12/14½*	*12/38½*	*13/35*	*14/41*	*15/36*
	mgn	7	(½)	...	...	...	...	...
Maindee West Jn		8	*10/41*	*12/16*	*12/40*	*13/36½*	*14/42½*	*15/37½*
	dep-line	9	ML	RL	RL	ML	RL	RL
	mgn	10	(½)	...	...	(½)	...	...
Newport (South Wales)		11	*10/42½*	*12/17*	*12/41*	*13/38*	*14/43½*	*15/38½*
	plt	12	2	DRL	DRL	2	URL	DRL
	dep-line	13	DM	DR	DR	DM	DR	DR
	mgn	14	{½}	...	...	...	...	...
Ebbw Jn		15	*10/46*	*12/20*	*12/44*	*13/41*	*14/46½*	*15/41½*
	plt	16	DRL	DRL	DRL	...	...	...
	dep-line	17	ML	RL	RL	ML	RL	RL
Marshfield		18	*10/48½*	*12/24*	*12/48*	*13/44½*	*14/50½*	*15/45½*
	dep-line	19	RL	RL	RL	ML	RL	RL
Long Dyke Jn		20	*10/56½*	*12/32*	*12/56*	*13/48½*	*14/59*	*15/53½*
	dep-line	21	E	E	E	C	E	E
Cardiff Central	arr	22	**10.58**	**12.34**	**12.58**	**13.50**	**15.01**	**15.55**
	plt	23	3B	3B	4B	2	4	4

Wales and Borders

c) – Timetable depicting timings for the proposed Cardiff – Abergavenny service (in an ITSS 3 scenario).

			1	2	3	4	5	6	7
Formed By									
Signal ID			**1W07MI**	**1W08MI**	**1W06MI**	**1W15MI**	**1W09MI**	**1W10MI**	**1W14MI**
Orig. Dep. Time			10.21	11.01	12.22	13.38	14.21	14.58	15.38
Orig. Loc. Name			Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central
Dest. Loc. Name			Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny
Timing Load			**197**	**197**	**197**	**197**	**197**	**197**	**197**
Operating Characteristics									
TOC			HL	HL	HL	HL	HL	HL	HL
Day of Operation			**SX**	**SX**	**SX**	**SX**	**SX**	**SX**	**SX**
Changes To Form			New	New	New	New	New	New	New
Cardiff Central	plt	1	0	3	3B	1	2	3B	3B
	dep	2	**10.21**	**11.01**	**12.22**	**13.38**	**14.21**	**14.58**	**15.38**
	dep-line	3	B	D	D	B	B	E	E
	mgn	4	{½}	...	...	{½}	{½}	{½}	(1)
Long Dyke Jn		5	*10/24*	*11/03*	*12/24*	*13/41*	*14/24*	*15/00½*	*15/41*
	dep-line	6	ML	RL	RL	ML	ML	RL	ML
	mgn	7	[1],(1½)	[1]	[1]	[1]	[1]	[1]	[1]
Marshfield		8	*10/30½*	*11/11½*	*12/32½*	*13/46*	*14/29*	*15/09*	*15/46*
	dep-line	9	ML	RL	RL	ML	ML	RL	ML
	mgn	10	...	...	...	(1)	...	...	...
Ebbw Jn		11	*10/33*	*11/15*	*12/36*	*13/49½*	*14/31½*	*15/12½*	*15/48½*
	dep-line	12	ML	RL	RL	ML	ML	RL	ML
	mgn	13	...	...	...	(½)	...	...	(½)
Newport (South Wales)		14	*10/35½*	*11/17½*	*12/38½*	*13/52½*	*14/34*	*15/17*	*15/51½*
	plt	15	3	2	URL	4	3	4	4
	dep-line	16	ML	RL	RL	ML	ML	ML	ML
Maindee West Jn		17	*10/36½*	*11/18½*	*12/40*	*13/53½*	*14/35*	*15/18*	*15/53*
Maindee North Jn		18	*10/38½*	*11/20½*	*12/42*	*13/55½*	*14/37*	*15/20*	*15/55*
	mgn	19	(6)	...	(1)	(3)	(1)	...	(4½)
Little Mill Jn		20	*10/55*	*11/31*	*12/53½*	*14/09*	*14/48½*	*15/30½*	*16/10*
	mgn	21	{2½}	{2½}	{3}	{3}	{3}	{3}	{2½}
Abergavenny	arr	22	**11.04**	**11.40**	**13.03**	**14.18½**	**14.58**	**15.40**	**16.19**
	plt	23	1	1	1	1	1	1	1

Wales and Borders

d) – Timetable depicting the timings for proposed Abergavenny – Cardiff service (in an ITSS 3 scenario

			1	2	3	4	5	6	7	8
Formed By										
Signal ID			**1Y98MI**	**1Y01MI**	**1Y02MI**	**1Y03MI**	**1Y99MI**	**1Y04MI**	**1Y07MI**	**1Y06MI**
Orig. Dep. Time			10.03	11.08	11.30	11.58	12.56	13.09	14.01½	15.00
Orig. Loc. Name			Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny	Abergavenny
Dest. Loc. Name			Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central	Cardiff Central
Timing Load			**197**	**197**	**197**	**197**	**197**	**197**	**197**	**197**
Operating Characteristics										
TOC			HL	HL	HL	HL	HL	HL	HL	HL
Day of Operation			**SX**	**SX**	**SX**	**SX**	**SX**	**SX**	**SX**	**SX**
Changes			New	New	New	New	New	New	New	New
To Form										
Abergavenny	plt	1	2	2	2	2	2	2	2	2
	dep	2	**10.03**	**11.08**	**11.30**	**11.58**	**12.56**	**13.09**	**14.01½**	**15.00**
	mgn	3	...	(½)	...	...	...	...	...	...
Little Mill Jn		4	*10/10*	*11/15*	*11/36½*	*12/04½*	*13/02½*	*13/15½*	*14/08*	*15/06½*
	mgn	5	...	(1)	...	(3)	(4)	(½)	...	...
Maindee North Jn		6	*10/17*	*11/26*	*11/46½*	*12/17½*	*13/16½*	*13/26*	*14/18*	*15/16½*
Maindee West Jn		7	*10/18½*	*11/27½*	*11/48*	*12/19*	*13/18*	*13/27½*	*14/19½*	*15/18*
	dep-line	8	ML	ML	RL	RL	RL	ML	RL	RL
Newport (South Wales)		9	*10/19½*	*11/28½*	*11/49*	*12/20*	*13/19*	*13/28½*	*14/20½*	*15/19*
	plt	10	2	2	DRL	DRL	1	2	DRL	DRL
	dep-line	11	DM	DM	DR	DR	DR	DM	DR	DR
	mgn	12	...	{½}	...	...	...	{½}	...	...
Ebbw Jn		13	*10/22½*	*11/32*	*11/52*	*12/23*	*13/23*	*13/32*	*14/23½*	*15/22*
	plt	14	...	...	DRL	DRL	...	...	...	...
	dep-line	15	ML	ML	RL	RL	ML	RL	RL	RL
Marshfield		16	*10/25*	*11/34½*	*11/56*	*12/27*	*13/25½*	*13/36*	*14/27½*	*15/26*
	dep-line	17	ML	ML	RL	RL	ML	RL	RL	RL
Long Dyke Jn		18	*10/29*	*11/38½*	*12/04*	*12/35*	*13/29½*	*13/44*	*14/35½*	*15/34*
	dep-line	19	D	E	E	E	E	E	E	E
	mgn	20	{½}	...	{½}	{½}	...	{½}	...	{½}
Cardiff Central	arr	21	**10.31**	**11.40**	**12.06**	**12.37**	**13.31**	**13.46**	**14.37**	**15.36**
	plt	22	3B	3B	4B	4B	3	4B	4B	4B

Wales and Borders

GLOSSARY OF TERMS

Term	Meaning
ATT	Advanced Timetable Team
CAPEX	Capital expenditure
Class 150 units	A class of diesel-multiple unit passenger train
Class 153 units	A single-coach railcar converted from Class 155 diesel-multiple units
Class 175 units	A long-distance diesel-multiple unit
CNH2	Line of route between Chester east junction and Chester south junction
Connectivity	Opportunity to travel between two locations
Control Period 6 (CP6)	Network Rail is funded in five-year periods. Control Period 6 is the funding period from April 2019 to March 2024.
Control Period 7 (CP7)	Network Rail is funded in five-year periods. Control Period 7 is the funding period from April 2024 to March 2029.
COVID-19	COVID-19 (coronavirus disease 2019) is a disease caused by a virus named SARS-CoV-2.
DDG	Demand Driver Generator
DfT	Department for Transport
DMU	Diesel Multiple Unit
Down Line	In UK terminology, the track normally used by trains proceeding away from the main terminus.
ELR	Engineering Line Reference, used by the railway to describe individual routes
Headcodes	All trains which run on the UK rail network are allocated a headcode; a 4-digit alphanumeric code used to identify a train service
HNL1	Line of route between Newport (Maindee West Junction) and Hereford (Red Hill Junction)
HOWL	The Heart of Wales line
Interchange	A station where a passenger may alight from one train and board another on a different route
ITSS	Indicative train service specification; a high-level timetable
LEP	Local Enterprise Partnership
Modal share	The percentage of travellers using a particular type of transportation or number of trips using said type
Multimodal	Characterized by several different modes of transportation
Net Zero	Achieving a balance between the carbon emitted into the atmosphere and the carbon removed from it
On-time Performance	Percentage of Recorded Station Stops called at on time or early; to be 'on time, the lateness at a particular RSS has to be less than 1 minute
OPEX	Operational expenditure
RBM	Risk-based maintenance regime
S&C	Switches and crossings
SHL	Line of route between Shrewsbury and Hereford
SWM2	The South Wales Mainline running through Newport
SYC	Line of route between Shrewsbury and Crewe
Up Line	In UK terminology, the track normally used be trains proceeding towards the main terminus.
Wales & Borders Route	The geographic area for the rail assets managed by Network Rail. This includes the Marches line to Crewe, and Wrexham – Rosset Junction (with North West & Central route taking ownership from Rosset Junction to Chester).
Wales & Borders Franchise	The franchise area operated by TfW Rail which includes routes in Wales and the English Borders and which extends to Manchester, Birmingham, Cheltenham and Bristol.
WSJ2	Line of route that runs north of Shrewsbury to Saltney Junction north of Wrexham General