



Llywodraeth Cymru
Welsh Government

Mainline railway enhancement requirements

September 2020



TRAFNIDIAETH CYMRU
TRANSPORT FOR WALES

Context

Since 2018, the Welsh Government (WG) and Transport for Wales (TfW) have progressed further work to develop the Strategic Cases for investment in Wales' rail network. This paper presents a summary of those developing cases, drawing upon a wide body of work, including:

- 2018, The Case for Investment (and supporting Programme Strategic Outline Cases (PSOCs))ⁱ
Identified over **£2Bn transport user benefits** that could be realised across Wales with a similar size capital investment programme; this figure would be higher if the full range of schemes set out below, and Wider Economic Benefits, are considered.
- 2019, A Railway for Walesⁱⁱ
This sets out the case for devolution of rail powers, current plans, wider well-being considerations and ambitions for future rail development and innovation across Wales. This was supported by a statement setting out the Welsh Government's key service and journey time aspirations

- The emerging findings of the South East Wales Transport Commission (SEWTC)^{iv}.
This works sets out the importance of significant further investment along the South Wales Main Line (SWML) corridor (via more capacity, additional services and stations) to provide the backbone of an integrated public transport network across the whole of South Wales.
- Further formal scheme and business case development work undertaken by TfW and regional partners related to projects like the Swansea Bay Metro, North Wales Metro, Ebbw Vale frequency enhancement, Maesteg frequency and Cardiff NW Corridor/ Cardiff Crossrail^v.
- Network Rail has also been developing Strategic Outline Cases (SOCs) under guidance from the Department for Transport (DfT) for schemes including: Relief Line Upgrade, North Wales Mainline improvements, and Swansea Cardiff journey times. Whilst welcome, these fall some way short of the Welsh Government's strategic ambition for the rail network in Wales.

In addition to the strategic transport schemes, examples of the most significant transport related economic development projects in progress or in planning across Wales are also set out.

Whilst there are a range of broader policy positions underpinning the need for more investment in public transport in Wales, the most pressing is the climate emergency. We all need to work towards decarbonising our transport systems and to reduce our car dependency which, pre-Covid, accounted for over 80% of commuting mode share. This is in line with our broader environmental and well-being objectives and goes beyond purely transport interventions.

The Welsh Government welcomes the fact that the UK Government is now exploring the opportunity to "level up" rail investment across the UK and notes that the success of the City and Growth Deals across Wales are to varying extents dependant on complementary improvements to rail connectivity, both within and to/from Wales.

More specifically, the Welsh Government's view is that genuine 'levelling up' cannot simply mean a sprinkling of new, ad hoc rail projects decided in Whitehall, it has to be part of a strategic approach to promoting growth in all parts of the UK. Neither can it just be about equality of access – merely the ability to 'bid in' to new funding sources – it must be about outcomes and a genuine attempt to narrow the real world gap in terms of rail infrastructure investment between Wales and the rest of the UK to support increasing economic growth and prosperity.

This requires a degree of positive discrimination to counter the inbuilt advantages of areas like the Southeast of England. 'Levelling up' has to be something which meaningfully involves devolved governments in the design and governance of its approach.



Strategic overview

As was set out in the 2018 Case for Investment, investment in transport services and infrastructure is necessary to deliver the Welsh Government's (WG) economic and well-being ambitions.

- To increase Wales' levels of productivity and improve its Gross Value Add (GVA) per capita (which is only 73% of UK average^{vii})
- and to deliver its obligations on decarbonisation, sustainability and well-being.

This is even more important given the scale and potential economic impact of rail schemes being developed elsewhere in the UK (especially HS2 which has the potential to negatively impact the Welsh economy without further transport interventions).

Our analysis is clear that a programme of investment in rail infrastructure in Wales is required to support a stronger, inclusive and more equitable economy, delivering prosperity for all by connecting people, communities and businesses to jobs, services and markets.

The development of strategic cases undertaken by WG and TfW has also included extensive interaction with key stakeholders (for example business groups like CBI, Growth Track 360, North Wales Economic Ambition Board; Health bodies, Academia, Local Authorities, City and Growth Deals) who have all shaped and support the emerging proposals.

Covid will clearly impact future transport planning. However, even with more local and home working, we still expect post Covid that there will be a need for more public transport given the very high levels of pre-Covid car use (~80% commuting mode share). The opportunity we have is to deliver more public transport over time and encourage more development in places that can be accessed by public transport - so called "Transit-Oriented Development" (TOD). This is vital, given that today many jobs, retail and public services are located in places that can only be accessed using a car. These are key considerations in the new Wales Transport Strategy, which is in development, and the National Development Framework.

Commuting

Changes in commuting mode in Wales, 2003-2017

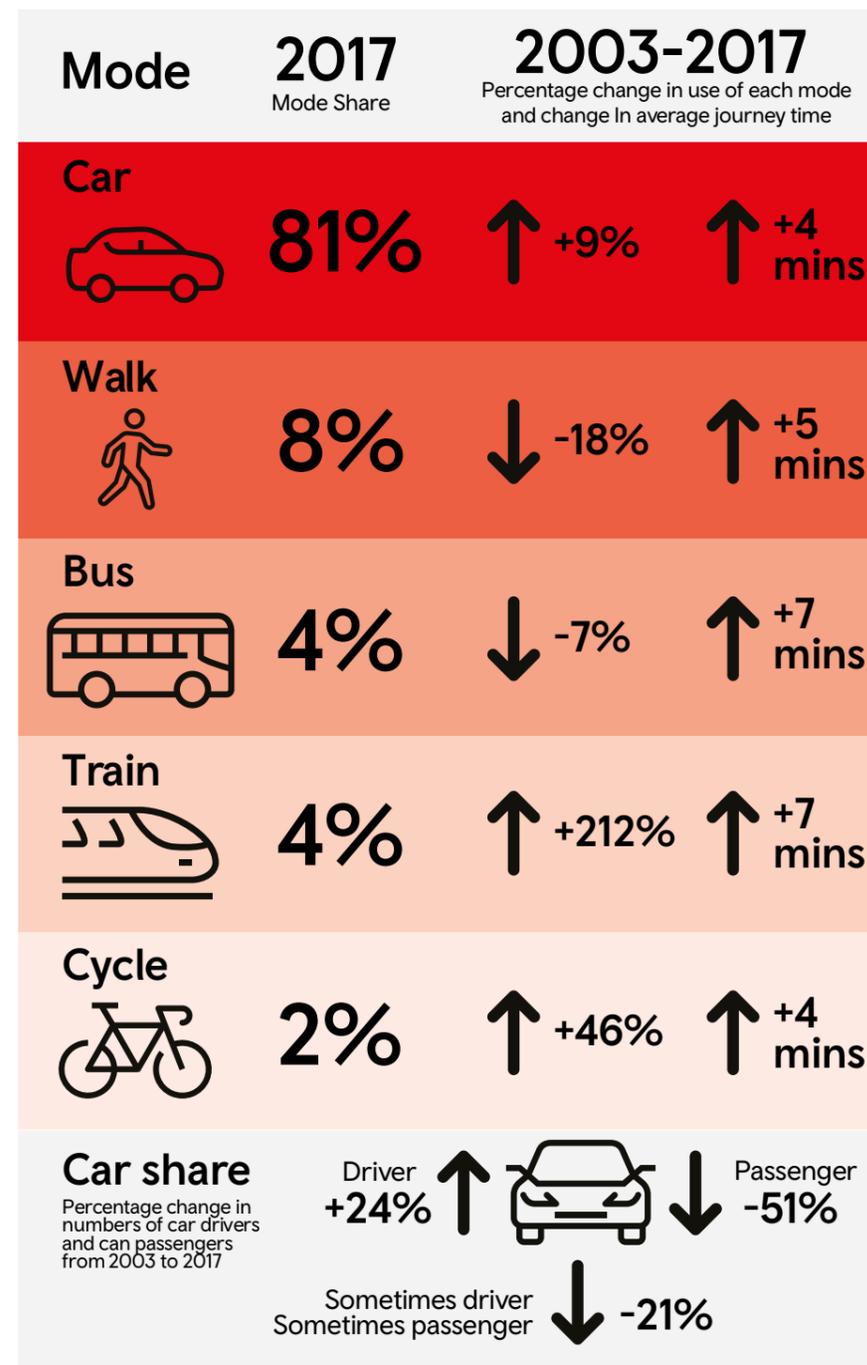


Figure 1 Commuting Mode share changes in Wales (Senedd Research)

South Wales

In the south, Cardiff, with its extensive rail links to surrounding towns, forms a substantial city region of 1.5 million people, as does Swansea to a lesser extent with a wider city region population of over 0.7 million (Figure 2). The city of Cardiff itself is now nearly 370,000 having grown from 310,000 in 2001 and plays a pivotal role in the Welsh economy.

When one considers the proximity of Bristol/Bath this creates an economic subregion with a population of over 3 million people that has major agglomeration potential across multiple industries including financial and professional services, semiconductors, biotechnology, and TV/Film production.



Figure 2 GWML/SWML serves over 3M from Bristol to Swansea

Improving the links and reducing journey times between the Swansea Bay City Region, the Cardiff Capital City Region, Bristol, London and Heathrow, as set out in 2017 by the Office of the Secretary of State for Wales^{vii}, will support further economic development opportunities.

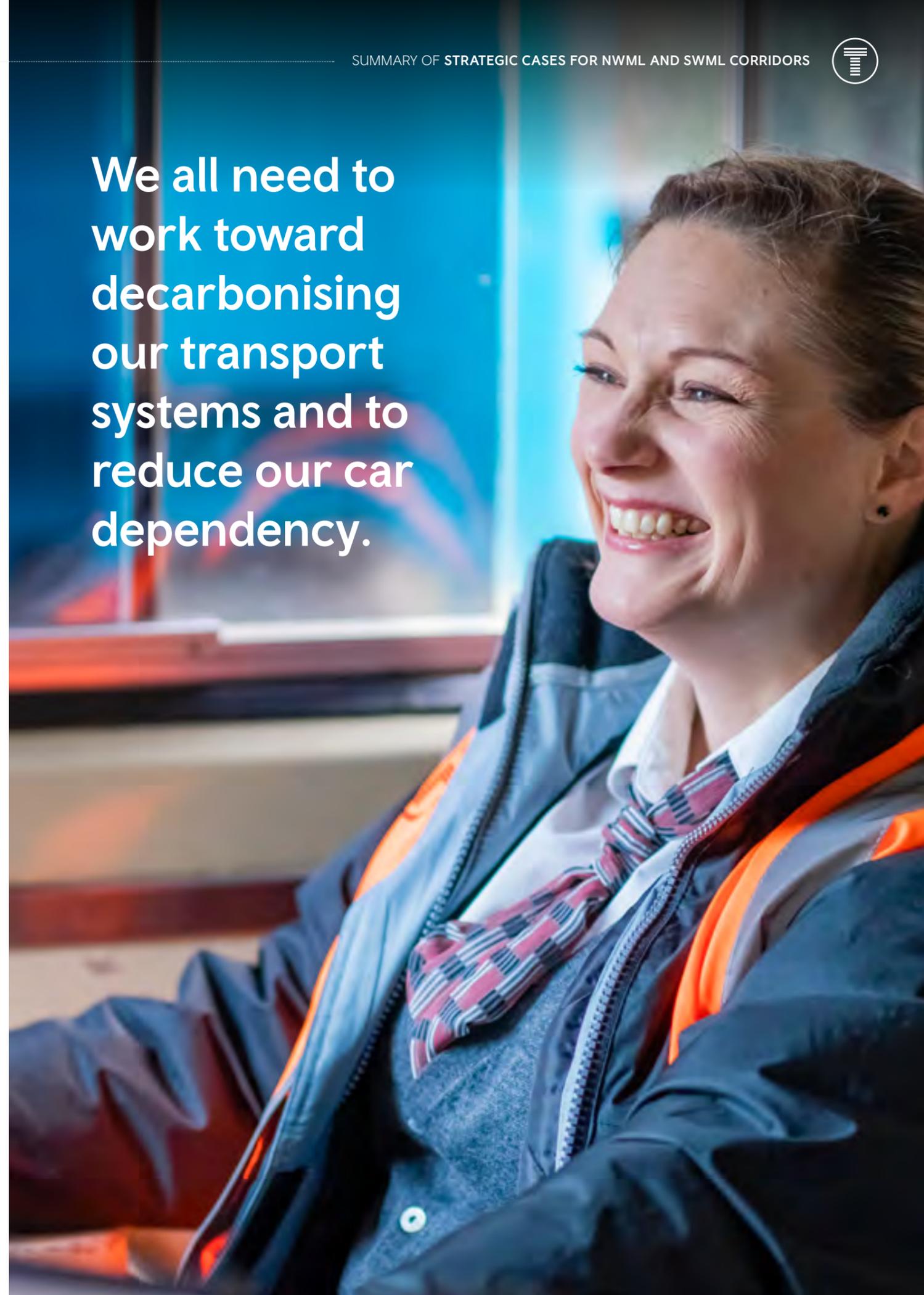
The role of Wales' leading higher education institutions and their impact on the national economy should also be noted; Cardiff University for example is one of the UKs leading research universities being ranked in the top five in the last formal research excellence assessment in 2014^{viii}.

Its role was crucial in the recent Cardiff Capital Region^x City Deal agreement to develop a compound semiconductor cluster^x in the region.

The Swansea Bay City Region needs to nurture and grow hi-tech companies – something set out in the Swansea Bay City Deal^x.

The deal includes a range of projects based on key themes of Economic Acceleration, Life Science and Well-being, Energy, and Smart Manufacturing; it also includes a region wide initiative to support innovation and low carbon growth.

We all need to work toward decarbonising our transport systems and to reduce our car dependency.



Primary transport issues in South Wales

Below represents a summary of the key transport issues that have been identified through the body of work undertaken in South Wales in the last few years:

- Rail journey times from west Wales to Bristol/London are poor; much of the South Wales main line (SWML) is a 90mph railway or less vs 125mph east of Bristol Parkway (figure 3); this constrains demand and encourages more car usage on already congested roads, with consequential air quality impacts; Cardiff is also the worst rail connected major city in the UK^{xii} in respect of direct services to other major UK cities
- Low service frequency and overcrowding from Cardiff to Bristol Temple Meads – 2tph. The demand for rail travel between Cardiff and Bristol estimated for 2043 in Network Rail's route studies, is similar to that between Manchester and Leeds which has 6tph. Leeds-Manchester connectivity will be further enhanced through the ongoing £3bn Trans Pennine Upgrade (TPU) programme; more ambitious £30bn plans have also recently been set out as part of Transport for the North (TfN)'s Northern Powerhouse Rail^{xiii}
- Much of east Cardiff and Newport (an urban population of over 300,000) is poorly served by rail and integrated regional public transport, contributing to more car use, congestion and air quality issues; especially in urban areas and on the M4
- The lack of a dedicated local commuter rail service for Swansea Bay's urban area (~300,000 pop.), and the alignment of both SWML and Swansea District Line (SDL) through Swansea and Neath Port Talbot (NPT) means that rail services are infrequent and relatively indirect when compared with the road network leading to congestion and air quality issues
- Key stakeholders have reported that rail patronage from the west of the Swansea Bay region (Milford Haven, Pembroke and Carmarthen) to the east of the region (Cardiff, Bristol and London) is low, partly because of the poor journey times.





Paddington - Swansea Linespeed (Down Direction)

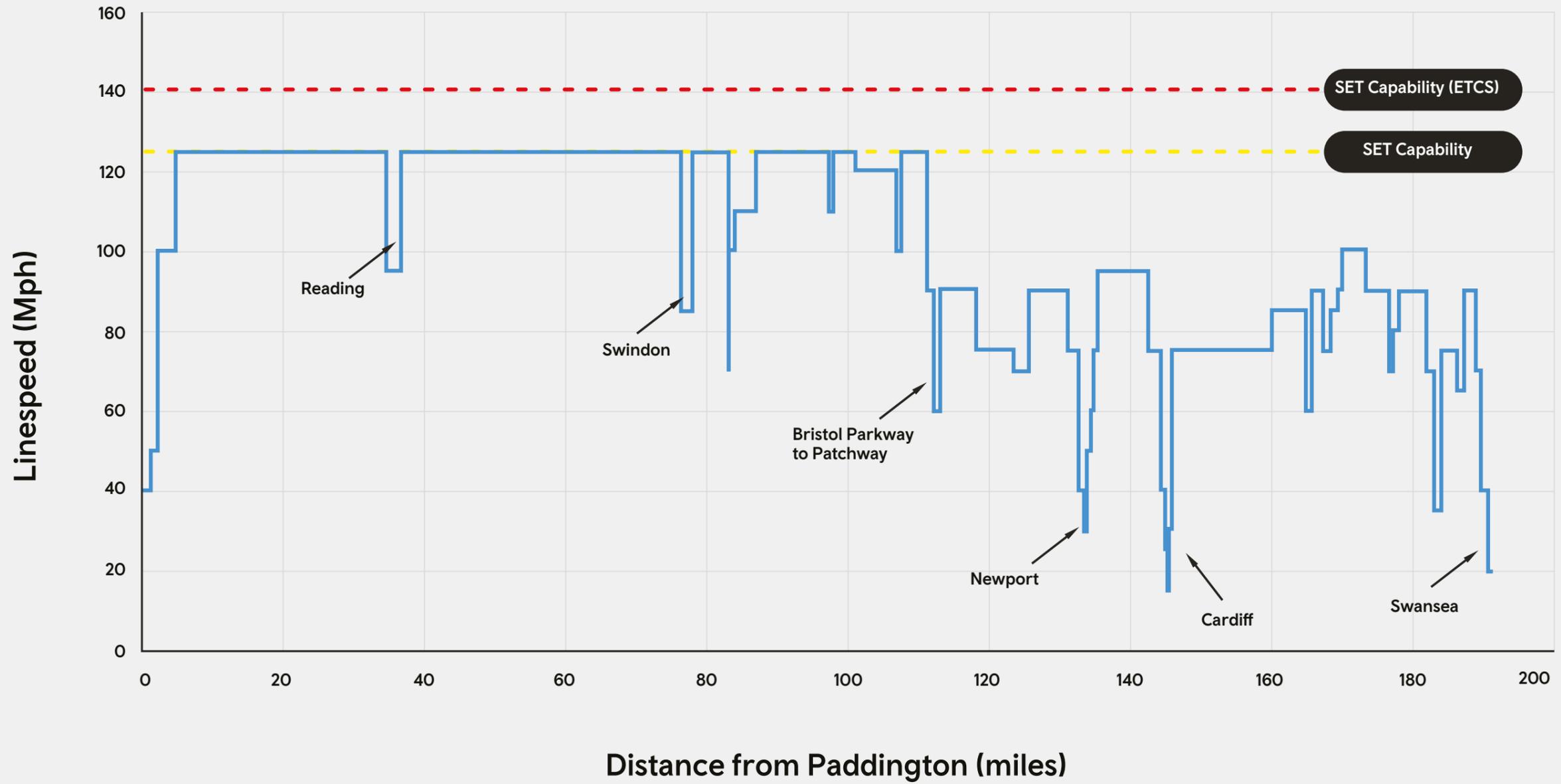


Figure 3 Line speeds on GWML between Paddington and Swansea (source ARUP)

North Wales

North Wales has a population of some 697,000 with the coastal strip towns east of Conwy accounting for some 175,000. In comparison Cheshire West and Wirral have a combined population of 660,000 and have direct access to the major centres of Chester, Liverpool and Manchester and major employment areas. The Mersey Dee area comprises north east Wales, west Cheshire and the Wirral. Whilst spanning the Wales – England boundary, the Mersey Dee area has been recognised as a single economic sub-region, with a population close to 1 million.

In the north an industrial cluster focussed on automotive, energy, aerospace and advanced manufacturing spreads across the border from Wales towards Chester.

The role of further education institutions like Coleg Cambria in supporting the regional economy in North east Wales is should also be noted. In north west Wales, the development of the marine energy economy (including new tidal power proposals at Colwyn Bay) is also important as is the tourist economy which impacts rail services and presents opportunities for better access and further growth. With the exception of the border areas, north Wales has struggled to attract and retain higher quality private sector jobs and relies more heavily on the public sector. The North Wales Growth Deal^{xiv} developed with the North Wales Economic Ambition Board^{xv} will help address these issues and provide a foundation to align economic development with enhanced connectivity along the NWML corridor.

Primary Transport Issues in North Wales

Below represents a summary of the key transport issues that have been identified through the body of work undertaken in North Wales in the last few years

- High car dependency for many journeys leading to congestion & resulting air quality issue
- Only 2tph Chester to Crewe related to capacity and operational constraints at Chester Station
- Low line speeds on North Wales Main Line (NWML) (LT 90mph) & modest frequencies impacting services to Manchester, Liverpool, London and South Wales; Victorian signalling in some places
- The need to better serve Bangor which is the busiest station on the NWML in north Wales.
- Borderlands line underutilised with low service frequency; journey times are also relatively poor and uncompetitive with car; the lack of through services to Liverpool means it does not serve potential commuter market well despite proximity.



Welsh Government investments

Since 2001 the Welsh Government has funded in whole or in part, a number of significant enhancements, despite this being a non-devolved responsibility. Projects include:

- Vale of Glamorgan Line reopening
- Ebbw Valley reopening
- Loughor Bridge replacement and double tracking
- New stations (some with a UK Government contribution) at places like Energlyn, Pye Corner, Bow Street, Ebbw Town and station improvements across the network such as Gowerton
- North South journey time improvements
- Merthyr frequency enhancements.

Now, with the transfer of the Core Valley Lines (CVL) and as part of the new Wales and Borders franchise, Transport for Wales is delivering the next phase of the ambitious South Wales Metro. This £740m enhancement investment (with approximately £190m from UK Government and £160m from the EU) will deliver:

- Electrification of the valley lines.
- Faster and more frequent services using new tri-mode and tram-train rolling stock.
- New and improved stations.

This demonstrates what the Welsh Government and Transport for Wales are able to deliver with devolved powers and funding in respect of rail infrastructure.





Priority schemes into the 2020's...

Building on what the Welsh Government and Transport for Wales are already delivering, there are a range of schemes along the South Wales and North Wales mainline corridors that have been subject to initial development by WG, TFW and/or local authorities over the last few years.

These all focus on the need to deliver more rail capacity, shorter journeys, more service, more stations and integration with bus and active travel. The primary drivers are to enable more efficient labour markets, support sustainable economic development, our collective need to address the climate emergency and to provide more sustainable mobility choices.

Post Covid the opportunity to support the economy through infrastructure development is also a key consideration.

In summary, the primary proposals that have been subject to initial development and merit further scheme and option development through Outline Business Cases (OBC), include:

South Wales proposals

#1 South Wales Mainline (SWML)

To bring the SWML up to the same standard as the other "main lines" across the UK, requires a major upgrade in terms of line speed, capacity and electrification. This is essential to enable delivery of the Welsh Government's journey time and economic ambitions and to integrate with the UK Government's Western Gateway ambitions in south west England^{xvi}.

It will also help maximise the benefits of the investment in the Core Valley Lines which is now the responsibility of the Welsh Government. Key requirements include:

- Additional London and Bristol Temple Meads services to Cardiff, Swansea and West Wales
- New SWML/Relief Line local services and stations/interchanges including: Magor, Llanwern, Cardiff Parkway, Rover Way/Newport Rd, M4 Junction 34, Cockett and St Clears
- Carmarthen to become the parkway for West Wales supporting faster services from Cardiff all the way to Milford Haven using the Swansea District Line
- Addressing bottlenecks on Network Rail's network impacting the future development of services and Metros

(for example Park/Ebbw Junction, Cardiff West junction and the two track sections of the SWML west of Cardiff)

The Welsh Government has also set out some journey time ambitions:

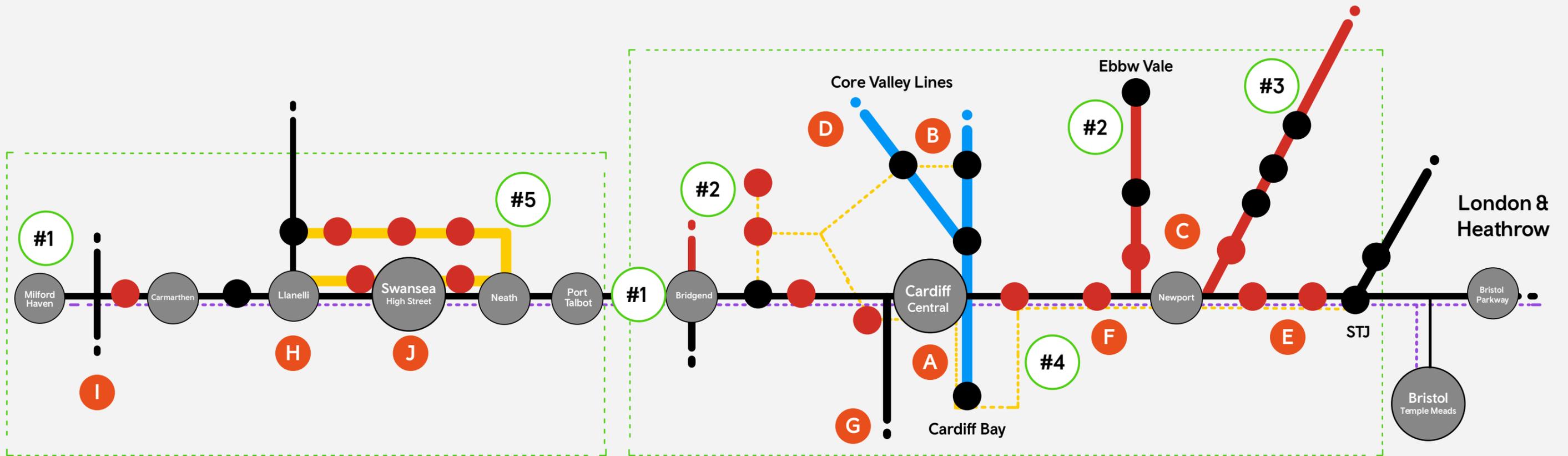
- 🕒 London > Cardiff **85 minutes**
- 🕒 Cardiff > Swansea **30 minutes**
- 🕒 Cardiff > Bristol Temple Meads **30 minutes**
- 🕒 Carmarthen > Cardiff **75 minutes**

In the interim a package of tactical measures are required (e.g. level crossing removal) to upgrade the SWML from Severn Tunnel Junction (STJ) to Milford Haven (inc. Swansea District Line and Relief lines) to more easily enable a mix of inter-city express and all stop commuter services.

All along this corridor there are significant development opportunities that will be influenced by these proposals; for example: Cardiff Parkway, Carmarthen and Newport, Cardiff and Swansea City Centres



SWML Corridor Priorities



- Primary rail lines/ express services
- Enhanced Marches, Ebbw Valley and Maesteg Line
- Metro areas
- Major stations
- Swansea Bay Urban Area Rail Metro
- Cardiff crossrail/NW corridor and Tram/Train on SWML
- New stations
- Transport related developments
- Enhanced SWML Intercity Services and Commuter Services

Figure 4

illustration, not all stations shown



To maximise the benefits of the investment required on the SWML, and that committed at Metro Central, there is also a need for the complementary development of integrated “feeder services” that connect and integrate with the additional SWML services. These are:

#2 Ebbw Valley & Maesteg Lines

Informed by the development work undertaken, significant investment is required to deliver 4tph Metro frequencies on the Ebbw Valley corridor (as is the case with the CVL) with additional stations and services to both Newport and Cardiff, and a spur to Abertillery. There are also significant network constraints impacting the ability to increase services on the Maesteg branch to more than 1tph.

Delivering enhanced connectivity of the Ebbw Valley, which is facing significant economic challenges, to both Cardiff and especially Newport will help support further development and regeneration in and around Ebbw Vale itself.

#3 Marches Line

Introduction of metro frequency services on the Marches line as far as Abergavenny, with further new stations at places like Caerleon where demand justifies. This is important for places like Pontypool which, like Ebbw Vale, is dealing with some serious economic challenges. More commuter services to Pontypool and Abergavenny and new stations will also help provide sustainable travel options to new developments like Mamhilad urban village and Sebastopol.

#4 Cardiff Crossrail (and NW Corridor)

The Cardiff Crossrail programme will upgrade and connect existing underutilised rail assets to enable 4tph on all the rail lines in Cardiff (e.g. Coryton and City Lines). This will provide much of the city access to high quality and frequent public transport services that integrate with SWML as well as connecting a number of major mixed used and/or brown field developments (e.g. Cardiff Bay,

Arena, Parkway, Plas Dwr, GE Life Science Hub). The route will also connect Splott and Tremorfa to the Metro, areas within the top 10% of Welsh Index of Multiple Deprivations (WIMD))^{xvii}.

The full extent of Crossrail extends west via the “NW Corridor” to Rhondda Cynon Taf (RCT) and a potential interchange with the SWML at Pontyclun. Subject to further analysis, CVL tram-train operations could also be extended east from the bay line via Roath dock and tidal sidings onto the relief lines to Cardiff Parkway, Newport or even Severn Tunnel Junction. This presents an opportunity to deliver more rail capacity on the SWML Corridor by avoiding the network constraint through Cardiff Central and to the west.

#5 Swansea Bay Urban Area Metro

To augment the additional SWML services to West Wales, TfW have initiated the initial development of an urban rail metro making better use of the Swansea District Line (SDL) with new stations and direct local services to both Swansea and Neath. This will require new infrastructure to connect the SDL and main line, an enhanced Swansea High Street and a number of new local stations.

There is an opportunity to align this programme with public sector relocations to town/city centres (eg DVLA) and major economic development and regeneration initiatives in Swansea and Neath. The Metro will also help support more sustainable and public transport connected residential development, around new stations on this network. As with the CVL, this investment provides a basis for continued development and expansion of a Swansea Bay Metro over the next 10 to 20 years.



North Wales proposals

#6 North Wales Main Line

To bring the NWML up to the same standard as the other “main lines” across the UK, requires a major upgrade in terms of line speed, capacity and electrification. This is essential to enable delivery of WG journey time and economic ambitions, and to integrate with the UK Government’s Northern Powerhouse. Key requirements include:

- Reduced stop main-line intercity services to reduce journey times
- All stop commuter services between Llandudno and Crewe/Wrexham and Holyhead and Llandudno Junction
- More service from North Wales across to Manchester and Leeds.
- New Stations at Holywell and Broughton

The Welsh Government has also set out some journey time ambitions:

- 🕒 Llandudno > Crewe **60 minutes**
- 🕒 Holyhead > Chester **60 minutes**

In the interim a rolling package of tactical measures to upgrade all the lines in North Wales to more easily enable a mix of intercity express and all stop commuter services (so removing level crossings, single track sections, etc).

#7 Crewe-Chester-Wrexham-Shrewsbury

There is pressing need to address capacity and reliability for services through Chester station; similarly plans for the integration of HS2 at Crewe must not disadvantage Welsh rail services.

The corridor between Chester and Shrewsbury via Wrexham needs enhancement to double track, remove level crossings and introduce new stations at Wrexham North and South aligned with new ‘all stop’ commuter services.

#8 Borderlands: Wrexham-Liverpool

The poor relation of the Welsh rail network is the Borderlands line. Beyond the contracted 2tph, there is an early need to enhance the infrastructure to avoid skip stop, introduce a new station at Deeside Industrial Estate and extend services to Birkenhead. Beyond that a major enhancement is needed.

This will include speed and capacity upgrades of entire line and more importantly integration of Merseyrail south of Bidston to deliver 4tph and direct services into Liverpool. As important this project could stimulate a range of development (especially housing) around stations on the line.

#9 Innovation

Whilst not directly related to the NWML and SWML, TfW is exploring the potential to apply different rail standards on other corridors in Wales to assess whether innovation in rail standard may allow the development of rail solutions that would not be possible with traditional Heavy Rail. This will, potentially, enable new options for North-South connectivity in the west of the country.

NWML Corridor Priorities

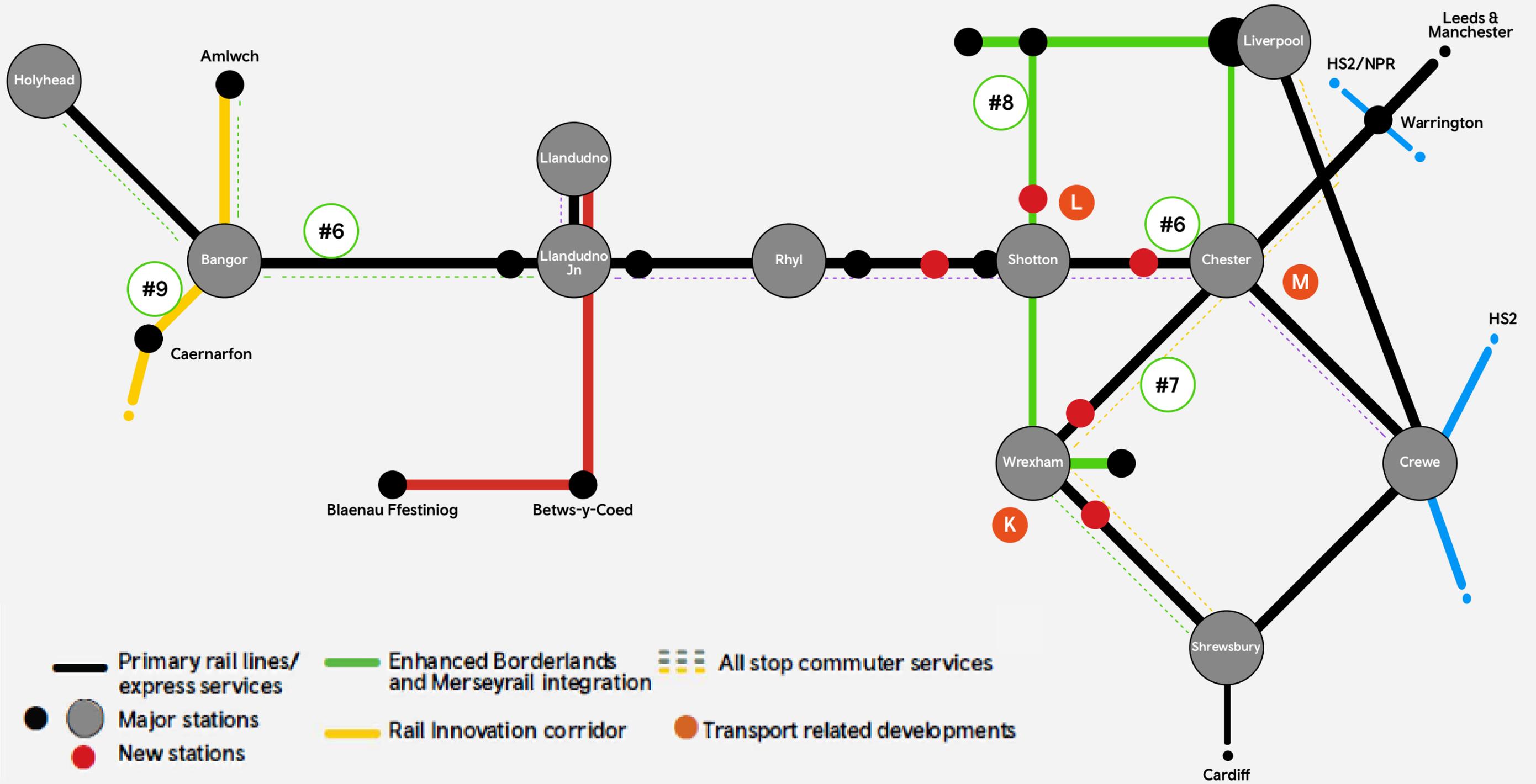


Figure 5

illustration, not all stations shown

South East Wales transport commission

Earlier this year Lord Burns (who is leading the South East Wales Transport Commission) published his emerging conclusions^{xviii}. There is significant overlap between those emerging findings and the proposals which the Welsh Government wishes to pursue. It is worth restating some of the key finding from Lord Burns' executive summary:

"Congestion on the M4 is largely a peak-hours problem, predominantly associated with commuting. A relatively small increase in traffic leads to a disproportionate increase in congestion. It is not a resilient motorway and the problems spill over onto the Newport road network, especially during incidents.

The M4 is largely used for regional, medium-distance travel, with many trips starting or ending in the cities of Cardiff, Newport and Bristol. Most journeys are over medium or long distances; there are relatively few short-distance journeys on the motorway.

Many people do not have good transport alternatives to the motorway. The combination of the rail, bus and active travel networks do not accommodate the range of the journeys that people are undertaking, particularly commutes.

All of the rail, bus and active travel networks are offering insufficient services. The individual modes are also poorly integrated, in relation to interchange, timetables and ticketing. This limits the value of each part. There is insufficient regional coordination.

Land use decisions with respect to homes, offices and retail parks have contributed to congestion and, on the current trajectory, this looks set to continue. At the same time, the population of the region's cities is projected to rise considerably. Without action, this will place additional pressure on the motorway.

If we are to alleviate congestion, we need to create attractive and viable alternatives for people. Until these exist, it is very difficult to solve the problem sustainably.

Of course, the COVID-19 epidemic has radically changed the situation – the question is for how long. Traffic is at a much lower level and we expect congestion to be less problematic while social distancing is in place.

In the long term, a substantive and sustained increase in remote working could have a meaningful impact on reducing traffic. However, our view remains that in order to function efficiently, the region requires additional, non-car transport options"

Key facets:

Three key facets of a response set out by the commission that the Welsh Government is supportive of, in principle, are:

- The development of a public transport grid across South East Wales with a mix of integrated express rail, local rail and bus services which is consistent with the commission's "network of alternatives".
- Demand management measures, including road charging (to more fairly apportion the significant external costs of car use: carbon emissions, road accidents, air quality and urban sprawl based induced demand).
- Planning policy and especially land use decisions to encourage and incentivise more transit-oriented development.





Overarching strategic benefits of emerging proposals

Transport cannot exist in isolation of the wider economy, so the Welsh Government and TfW have identified a range of high-level benefits for the various Strategic Cases for the main rail routes across Wales, including:

Economic Benefits

- Enhanced connectivity between key economic centres like Swansea, Cardiff and Bristol will help create more efficient labour markets and bring forward new mixed use and housing development around existing and new stations along this corridor; this is very much in keeping with the Welsh Government's desire to encourage regeneration and transport oriented development at/near stations across the network
- The Welsh Government have previously estimated Transport User Benefits of £2Bn are likely; a figure that is likely to be higher when the full range of schemes set out, and agglomeration and Wider Economic Benefits are included.

Environmental and Wellbeing Benefits

- Given the urgency required to address the climate emergency, these measures provide the radical increase in public transport capacity required to reduce currently very high levels of car use. Across Europe cars are the biggest contributor (even if all electric) to transport carbon emissions (~60%), which is the only sector that has increased its carbon footprint since 1990^{xix}

- Reduced car use can also improve health outcomes from fewer road accidents (125,000 each year in the UK, 25,000 serious injuries and 1,700 fatalities^{xx}) and improved air quality to reduce the current estimated 30,000 premature deaths per year^{xxi} caused by air pollution.

Transport System Benefits

- The proposals set out will deliver a more flexible and efficient railway, able to operate a mix of express and integrated local commuter services
- Offering more attractive rail services to more people will significantly improve efficiency of rail operations and reduce subsidy per passenger.



Transport led economic development and regeneration opportunities

Beyond those higher level benefits, there are number of significant development opportunities and economic activities along both the SWML and NWML corridors that are dependent on, or whose impact can be enhanced through improved rail services and connectivity all the way from Bristol to Milford Haven and Holyhead to Chester. Some of these are part of the City and Growth Deals based around Cardiff Capital Region, Swansea Bay and North Wales, they include:

Cardiff Capital Region Projects

- As part of the **Cardiff Crossrail** there are several major contingent developments. For example, at **Cardiff Central/Central Quay(A)** and **Cardiff Bay(A)** including more residential, hotel, commercial and a potential Higher Education Institute. There is also the prospect at GE/Forest Farm for a **Life Sciences Innovation Park(B)** anchored by GE and the Wales Genomics Centre.
- Delivering more commuter service into Newport City Centre from across the region will help support the development of the **Newport Knowledge Quarter(C)** with partners including Alacrity, Alacrity Cyber, USW Cyber school and Airbus. There is also an opportunity to consider the re-location of the UK Government's facilities (such as the Patent Office and ONS) to a location in Newport city centre.

- The schemes set out will enhance the accessibility of the **Nantgarw/Treforest Industrial Estate(D)** and help bring forward a major mixed use regeneration project including more residential; this augments the relocation of the Department of Work and Pensions (DWP) adjacent to the new Metro stations planned at Nantgarw.
- New SWML commuter services and a new station at Llanwern will connect **Llanwern/Glan Llyn(E)** residential development to the rest of the region and help bring forward further development sites near the station.
- The new station in development at Cardiff Parkway provide the opportunity for more "mixed use" development at **Hendre Lakes(F)^{xxii}**, this site is at the heart of the corridor between Newport and Cardiff which is already a regional centre for Compound Semiconductors (CS)^{xxiii} (inc. SPTS, Newport Wafer fab, IQE, Cardiff University)
- Enhanced connectivity to **Cardiff Airport/St Athan(G)** will help support a major centre for the development of lithium-ion battery and storage technologies for the automotive sector. British Volt at Bro Tathan has set out its intent to support up to 4,000 jobs supported by the UK Government's Department for Business Energy and Industrial Strategy (BEI)/UK Battery Industrialisation Centre.

Swansea Bay and West Wales Projects

- Enhanced intra/regional connectivity will help the development of a **Life Science and Wellbeing Village(H)** in Llanelli. This unique facility includes a Community Health hub comprising of Clinical Delivery & Research Centre; a Wellbeing Skills Centre linked to modern clinical practice and service delivery; a Wellness Hub comprising leisure facilities, assisted living and affordable housing.
- **Pembroke Dock Marine(I)** will establish a centre for marine engineering focussed on low carbon energy combined with research, development and innovation support. Pembroke Dock Marine will expand on an energy and engineering cluster attracted to world-class natural geography and energy resources, a high skill supply chain, port infrastructure and National Grid availability.
- **The Swansea City and Waterfront Digital District(J)** project, at the heart of a wider regeneration initiative, includes a 3,500-seat digital arena able to host a range of events and conferences. The Digital Village and Box village and Innovation Precinct at University of Wales Trinity Saint David provides incubation and co-working space for start-ups and small businesses. Better transport connectivity from across the wider region will enhance the impact of these developments.

North Wales Projects

- The **Wrexham Gateway(K)^{xxiv}** regeneration project which includes academic, commercial and sporting themes, will benefit from the enhanced public transport connectivity proposed across north Wales and north west England.
- **Deeside Industrial Park and Airbus(L)** and the wider aerospace cluster will benefit from increased accessibility and access to a larger pool of labour, through enhancement to the Borderlands line, additional North Wales Mainline commuter services and new stations at Deeside Industrial Estate and Broughton.
- There are significant regeneration benefits (as well as rail operations benefits) for the implementation of the comprehensive proposals at and around **Chester Station(M)**



The funding gap...

In restating the strategic case for rail investment in Wales, we also need to acknowledge the lower level of rail enhancement investment in Wales vs the rest of the UK network. Enhancements improve the capability, capacity, reliability of the rail network. So, the limited share of such investment in Wales, over a prolonged period, has led to relatively less attractive services, attracting fewer passengers leading to lower modal share and higher subsidies vs the rest of the UK. This is different from the Operations, Maintenance and Renewal Spend (OMR) which is about maintaining the network's current capability and reliability.

Whilst any commitment to the funding of rail in Wales by the UK Government is welcome, for example recent commitment re: Cardiff Central and the work re: Great Western Mainline Electrification(GWEP), we cannot ignore the impact of the long term underfunding of enhancement to Wales' rail network. This is impacting Wales' economic performance given the known links between connectivity and economic activity, especially efficient labour markets.

In broad terms, when one includes Crossrail and HS2 we estimate that across the UK between 2001 and 2029 there have or will be, at least £100Bn^{xxv} of UK Government funded rail enhancements. Over the same period, we estimate generously that the total of rail enhancement in Wales funded by UK Government is of the order of £2.2Bn. This figure also includes a Barnett consequential of £755m resulting from an increase in the DfT budget at the 2015 spending review, and the entirety of costs for the electrification of the Severn Tunnel and so a Wales Route based allocation.

A more proportionate share of total UK Government investment in Wales over the same period would be of the order of £5Bn if based on population (~5%) or £10Bn, if based on the length of the Wales route (~10% of the UK network). As a comparator, the equivalent Welsh Government investment over the same period is about £1Bn on what, now excluding (since March 2020) the Core Valley Lines (CVL), is a non-devolved area.

Any UK Government levelling up agenda that the Welsh Government could support has to include a major overhaul in how rail scheme development, funding and delivery is discharged in Wales. The transfer of the CVL to the Welsh Government, which has in effect devolved some of the rail network to Welsh Government, perhaps provides a catalyst. Without significant change very few of the emerging proposals set out here are likely to proceed.



Who we are

Set up by the Welsh Government as a not-for-profit company in 2015, Transport for Wales (TfW) is driving forward the Welsh Government's vision of a high-quality, safe, integrated and affordable transport network.

A reliable, accessible and low-carbon network of which the people of Wales can be proud. Everything TfW does supports the achievement of Welsh Government policies and is aligned with the Welsh Government's policy framework as well as the well-being goals set out in the Well-being of Future Generations (Wales) Act 2015.

Better public transport underpins sustainable economic growth and also offers real benefits for people, improving access to employment opportunities and achieving stronger integration of education, health and other services.

TfW is building a sustainable transport network fundamental to a thriving Welsh economy now and in future. The transfer of the Core Valleys Lines railway infrastructure from Network Rail to TfW in March 2020 was a key milestone and has enabled TfW to start building the South Wales Metro.

Added to this, since 2018 the Welsh Government and TfW have also developed strategic business cases for investment in Wales' rail network. TfW is also working hard to improve the quality and consistency of the evidence underpinning transport decision-making and investment in Wales.

This document summarises the strategic cases for priority rail schemes in North and South Wales.

Better public transport underpins sustainable economic growth and also offers real benefits for people





Table 1 Summary of schemes and Economic Development Sites.

Rail Schemes	Economic Development Sites
#1 South Wales Main Line (SWML) Upgrade	A Cardiff Central, Central Quay and Cardiff Bay
#2 Ebbw Valley And Maesteg Lines Upgrade	B GE Life Science Innovation Park
#3 Marches Line Upgrade	C Newport Knowledge Quarter
#4 Cardiff Crossrail (& NW Corridor	D Nabtgarw/Treforest Industrial Estate
#5 Swansea Bay Urban Area Rail Metro	E Llanwern/Glan Llyn
#6 North Wales Main Line (NWML) Upgrade	F Hendre Lakes/Cardiff Parkway
#7 Crewe-Chester-Wrexham-Shrewsbury	G Cardiff Airport/St Athan Business Park
#8 Borderlands: Wrexham-Liverpool	H Life Science and Wellbeing Village
#9 Innovation	I Pembroke Dock Marine
	J Swansea City and Waterfront District
	K Wrexham Gateway
	L Deeside Industrial Park and Airbus
	M Chester Station

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