



Amlwch to Gaerwen

Restoring Your Railway Strategic Outline Case

Transport for Wales

September 2022



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1. Overview

Context

In January 2020, the UK government pledged £500 million for the Restoring Your Railway Programme to deliver its manifesto commitment to start reopening lines and stations, as part of its Levelling-Up agenda. The Department for Transport (DfT) invited MPs, local councils and community groups across England and Wales to propose how they could use funding to reinstate local rail services, and restore stations and infrastructure.

The focus is on demonstrating the benefits of these schemes to the regeneration of local economies and communities, and improve access to jobs, homes and education.

A proposal to reopen the Amlwch to Gaerwen railway to passenger services on the Isle of Anglesey and connections to Gwynedd (e.g. Bangor) has received funding through the programme to develop a Strategic Outline Case (SOC) under the third round of the Ideas Fund.

Purpose of this Document

This document is a summary of the SOC prepared for Transport for Wales (TfW) that explores the transport connectivity options between Amlwch and Bangor. It has been developed in accordance with the Stage 1 Welsh Transport Appraisal Guidance (WelTAG) and follows the Five Case Business Case Model, comprising the:

- **Strategic Case** – setting out the case for intervention and investment within the context of local, regional and national policy, before identifying the set of objectives and longlist of options,
- **Economic Case** – covering rail and bus solutions, this case details the initial sifting process which utilises the WelTAG qualitative assessment criteria, to identify a short-list of options,
- **Financial Case** – outlining how the scheme could be funded,
- **Commercial Case** – outlining potential approaches to delivery,

- **Management Case** – setting out how the scheme could be progressed.

Using this model, the SOC explores the context of transport, wider socio-economic issues and challenges on Anglesey, and presents a range of possible transport solutions to address these, establishing a short-list of options for more detailed consideration through subsequent WelTAG stages.

The key issues and challenges are summarised in **Table 1**.

Table 1 – Key Issues and Challenges for the Corridor

Poor Accessibility	Levelling Up
Much of the study corridor experiences significant access-to-services deprivation.	The Isle of Anglesey falls into Levelling Up Category 2, while Gwynedd sits in Category 1 – most in need of investment.
Climate Emergency	Deprivation and Social Inequality
Transport emissions contribute: <ul style="list-style-type: none"> • 34% for the Isle of Anglesey, and • 39% for Gwynedd, of total emissions respectively; which is higher than the UK average of 27%.	Amlwch Rural Ward experiences higher levels of deprivation in terms of access to services, sitting in 10-20% most deprived. Llanfihangel Ysgeifiog, the LSOA in which Gaerwen sits, falls within the 20-30% most deprived and Bangor in the 30-50% most deprived.
Car Dependency	Low Productivity
Car travel forms 75-90% of the journey to work modal share in the study area, with Bangor being an exception (42%). Low mode share of public transport: 0-3% rail, 3-8% bus.	Gross Value Added (GVA) per head across the study corridor is significantly lower than the Wales average.

2. Strategic Case

This Strategic Case sets out:

- The case for change – describing why further investment in transport is needed in the area,
- The objectives for intervention – that need to be achieved with this investment,
- The long list of options – that were considered as potential solutions.

Case for Change

The case for change is built up from a review of relevant policy, the social, cultural, economic and environmental issues and challenges, patterns of travel demand, and existing public transport provision. These demonstrate the need for investment and inform the objectives for intervention.

Policy Context

Reopening the Amlwch to Gaerwen railway has strong strategic alignment with the local (Anglesey & Gwynedd), regional (North Wales) and national (UK and Wales) policy and strategy base. The key policy documents are listed in **Table 2** and are outlined below. Further detail is contained within the full SOC document.

National Policy

The Welsh Government, through Llwybr Newydd: the Wales Transport Strategy 2021, sets out the vision for an accessible, sustainable and efficient transport system. The priorities of the strategy are presented in **Figure 1**.

The Amlwch to Gaerwen scheme aligns strongly with the overarching transport strategy by potentially improving accessibility by public transport to employment and education opportunities, and encouraging modal shift away from the private car to support transport decarbonisation.

Table 2 – Policy Review

Published by	Scale	Title
Welsh Government	National (Wales)	Llwybr Newydd: the Wales Transport Strategy
		Well-being of Future Generations Act
		Labour / Plaid Cymru Deal
		Railways for Wales Case for Devolution
		Healthier Wales
		Net Zero Wales
		Taking Wales Forward; 2016-2021
		Prosperity for All: The National Strategy
	Prosperity for All: The Economic Action Plan	
	Regional	Moving North Wales Forward
Transport for Wales	National (Wales)	TfW Business Plan
		How we're developing Metro
Department for Transport	National (UK)	Decarbonising Transport: A Better, Greener Britain
HM Government	National (UK)	Levelling Up the United Kingdom
		Net Zero Strategy: Build Back Greener
Gwynedd Council	Local	Well-being Statement
Anglesey Council	Local	Plan 2017-2022
	Local	North Anglesey Economic Regeneration Plan
	Local	Destination Anglesey Management Plan

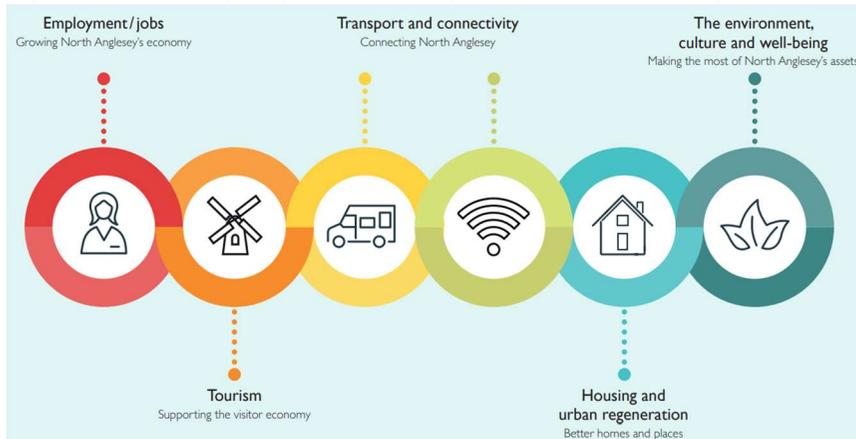
Figure 1 – Llwybr Newydd: the Welsh Transport Strategy 2021 - Priorities¹



Regional Policy

The North Anglesey Economic Regeneration Plan (2019)² identifies transport connections to the area as a challenge across North Anglesey. It also highlights that “Amlwch is relatively remote from the main transport networks with limiting road links”. The priority themes of the Economic Regeneration Plan are shown in **Figure 2**.

Figure 2 – North Anglesey Economic Regeneration Plan - Priority Themes



Improving connectivity from Amlwch to Llangefni and Bangor, which are major employment, retail and service destinations for people from Amlwch would provide enhanced, affordable access to education and employment, which is seen as critical to addressing the issue of

younger people moving away from the area and supporting sustainable growth in the area.

Local Policy

The Anglesey and Gwynedd Joint Local Development Plan (2017)³ sets out the following issues to be tackled, which are relevant to the proposed scheme:

- Promote opportunities for people to live healthy lives and have reasonable **access to health care**, especially within an ageing population.
- Areas with high levels of various types of **deprivation**.
- Access to **facilities and community services**, leisure facilities and formal and informal entertainment along with access to the countryside.
- **Low productivity** (Gross Value Added, per capita) of the local economy.
- **Access to education** and appropriate training skills.
- A continued decline in the prosperity and **vitality of town centres** as places offering shopping, leisure, employment, and housing opportunities.
- Need to mitigate the effects of **climate change**, e.g., reduce greenhouse gas emissions, promote generating renewable energy and low carbon.
- The impression that parts of the area are **remote**.
- Areas with **poor telecommunications** and information and communications technology (ITC) connections.
- Problems with accessibility to services and facilities, in particular in rural areas because of a **lack of choice** in terms of modes of transport.

Improving connectivity between Amlwch and Gaerwen will help a higher number of people in rural areas access facilities in Llangefni and Bangor, and better access to employment centres will support the local economy.

¹ [Llwybr Newydd A New Wales Transport Strategy 2021: full strategy \(gov.wales\)](#)

² [North-Anglesey-Economic-Regeneration-Plan.pdf \(gov.wales\)](#)

³ [Anglesey-and-Gwynedd-Joint-Local-Development-Plan-Written-Statement.pdf \(llyw.cymru\)](#)

Social & Cultural Context

There is an aging population across the study area. This reinforces the need to reduce outward migration by young people through improved transport provision, and to ensure that as people age, they are well-served by public transport.

Llwybr Newydd: the Welsh Transport Strategy highlights the significant role that transport has to play in supporting culture across North Wales. The visitor economy, which contributes £1.2 billion in annual spend in North Wales is a key component of the regional economy that would be supported by improving access by public transport to some of the region's most attractive visitor locations.

Modal choice when travelling to places of employment and education is dominated by private vehicle use, and these trips represent 20% and 15% of all journeys completed in Anglesey and Gwynedd respectively. Very low levels of public transport use is a key pattern across the area, with high reliance on the private car demonstrated by **Figure 3**.

This further demonstrates the need to reduce reliance on private vehicles, and enhance access to education and employment opportunities by improving the public transport network.

Access to Services Deprivation⁴

Access to services deprivation (**Figure 4**) is high along the corridor: Amlwch Port falls within the 30-50% most deprived wards overall, while Amlwch Rural experiences higher levels of deprivation specific to access to services, sitting in the 10-20% most deprived.

Llanfihangel Ysgeifiog, the LSOA in which Gaerwen sits, falls within the 20-30% most deprived and Bangor in the 30-50% most deprived. Llangefni sits within three LSOAs; Cefni and Cygnar present lower levels of deprivation falling into the category of 50% least deprived, whereas Tudur lies within the other end of the spectrum in the 10-20% most deprived.

⁴ Note: percentiles refer to Wales only deprivation levels.

This reinforces the need to improve access to services through the provision of an integrated public transport network in the area.

Figure 3 – Journey to Work Modal Share (Census, 2011)

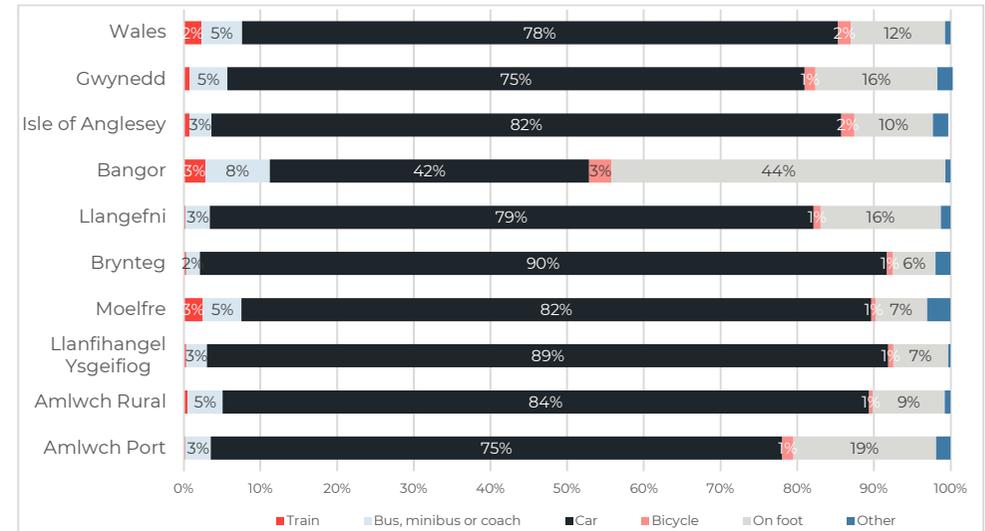
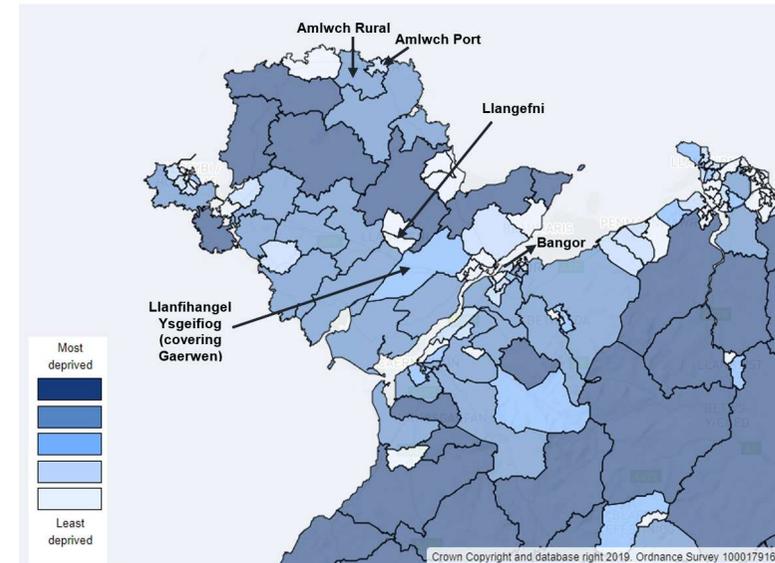


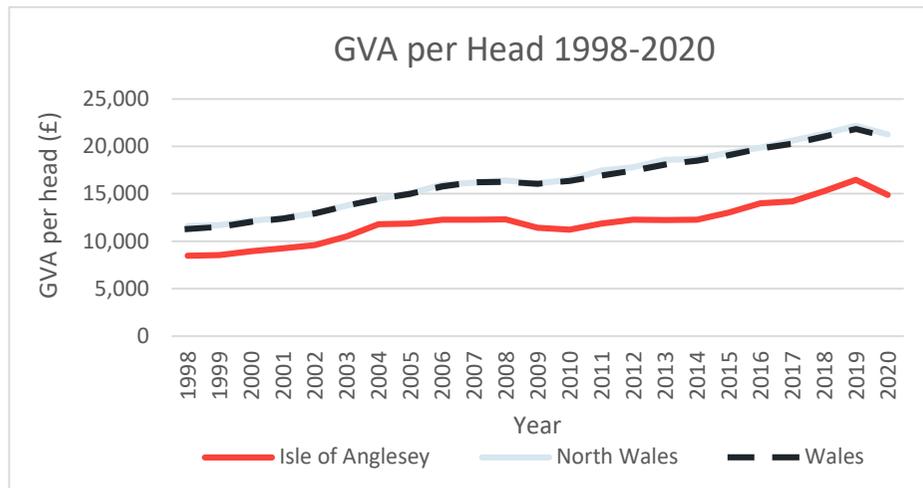
Figure 4 – Welsh Index of Multiple Deprivation: Access to Services Deprivation



Economic Context

- An increase in journey times results in reduced productivity, contributing to the GVA per head across the study area being **significantly lower** than the Wales average.
- Anglesey consistently lags behind in economic productivity when compared to the North Wales region and Wales as a whole.
- The majority of people seek employment in the area they live, reflecting in part a lack of connectivity to wider employment opportunities.
- Travel demand for commuting between the Isle of Anglesey and Gwynedd is high, with Anglesey presenting the largest proportion of out-commuters (with these commuting to Gwynedd).
- Key employment sites and areas with growth potential are located in North Anglesey and Bangor, highlighting the importance of connectivity between these locations and the towns in-between to the local economy.

Figure 5 – GVA per head 1998 - 2020



Catchment

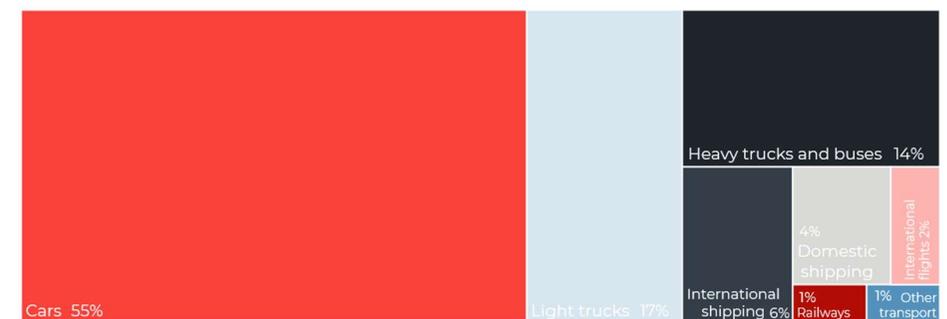
- Amlwch and Gaerwen each have catchments of below 500 within 20 minutes, meaning that the public transport network is not easily accessible or that there is a minimal catchment area within the immediate vicinity of the interchanges.
- Bangor has a significant catchment that suggests opportunity to provide further rail connections to bolster its status as a key interchange in North Wales.
- Llanfairpwllgwyngyll and Llangefni have 20-minute catchments of above 2,000 and above 1,000 respectively, suggesting that new public transport infrastructure would support sustainable connectivity to employment, education, and leisure opportunities for many.

Environmental Context

It is critical that Wales works to reduce its carbon emissions in order to meet its Net Zero targets (Net Zero by 2050) and contribute to the UK's overall Net Zero target.

Transport is the third highest emitting sector in Wales, and therefore this proposal for a public transport corridor between Amlwch and Gaerwen would contribute to achieving Net Zero targets through encouraging modal shift and reduced reliance on the private car, which currently dominates Welsh travel.

Figure 6 – Wales Transport Sector Emissions in 2019



There are a number of environmentally sensitive environments within the study area, which coincide with some of the most significant visitor destinations. Therefore, sustainable access options are needed to ensure adequate protection of these designations, and the continued enjoyment of the natural environment.

Rail

- Existing rail provision on Anglesey is extremely sparse, and there are no direct rail services between Amlwch, Llangefni and Bangor.
- The former Anglesey Central Railway corridor presents an opportunity to re-provide services to locations such as Llangefni and Amlwch from the North Wales Mainline.
- Bangor station experienced an overall increase in entries and exits between 2004 and 2019, before decline resulting from the Covid-19 pandemic. This demonstrates that there is potential demand for connections to and from Bangor station.
- Across Wales, patronage had been increasing prior to the pandemic. At a local and regional level, patronage had been declining from 2011, a trend that is reinforced by the lack of rail infrastructure on the Isle of Anglesey.
- Bangor station has the provision for a fully accessible multi-modal interchange, supporting sustainable connectivity for all.

Bus

- Key bus stops on existing routes between Amlwch and Bangor are lacking shelters, seating provision, information boards, and cycle parking facilities, creating accessibility and multi-modal challenges.
- Wales has seen a steady decline in bus patronage of around 14% from the average between 2010 and 2019, prior to the impact of the pandemic.
- Distance travelled by bus (in all of Wales) in 2019-2020 has declined by 28.2% to 88.8 million vehicle kilometres from 2009-2010, where distance travelled was 125 million vehicle kilometres.

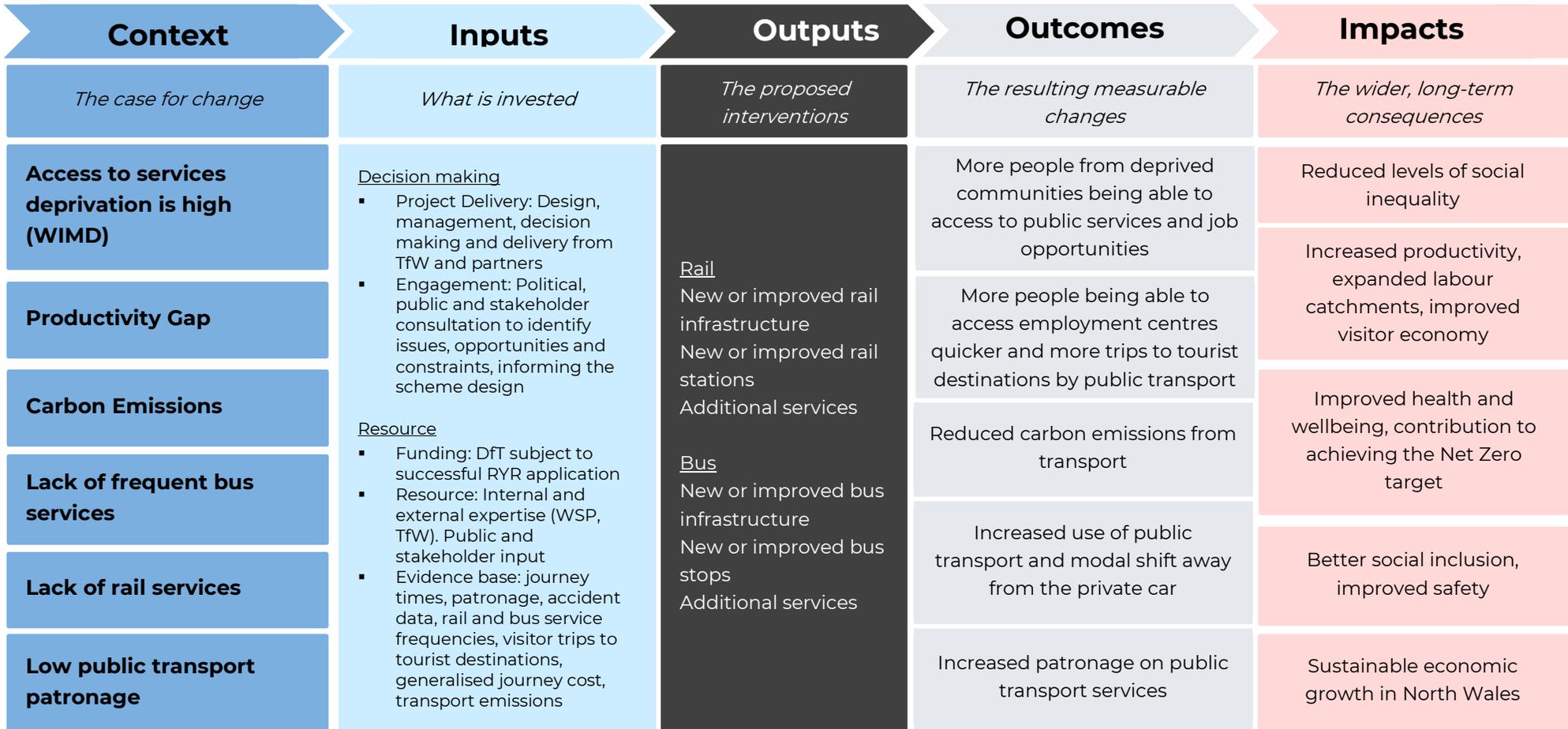
- The Welsh Government is considering a new approach to bus service provision driven by public need rather than relying on market demand.
- Bus service frequency is variable across the study area, however, is notably poor between Gaerwen and Bangor, with less than one service per hour, including at peak times.
- The journey between Amlwch and Bangor takes almost twice as long by bus than by car, with only a marginal cost saving, making bus an unattractive alternative for this route.

Objectives for Intervention

The objectives for intervention have been derived through a logic mapping process, presented in **Figure 7**. This process starts by highlighting the context, considering the impact and change that potential intervention is intended to achieve.

The objectives that result from this process are shown at the base of the logic map.

Figure 7 – Logic Map and Objectives for Intervention



The Objectives for Intervention

1. Improve journey times by public transport between population centres and key employment opportunities, thereby supporting socioeconomic growth in North Wales.
2. Reduce carbon impacts and greenhouse gas emissions from transport, thereby adapting to the impact of climate change.
3. Better connect local communities by public transport between Amlwch and Bangor to core public services including educational opportunities.
4. Create an integrated sustainable transport network that is safe, reliable and affordable, providing a realistic alternative to the private car.
5. Support the visitor economy in North Wales by improving public transport accessibility to key destinations.
6. Support delivery of the North Wales Metro proposals.

Long List of Options

A long list of options has been developed to identify the range of interventions available to address the issues and problems identified in the case for change, and meet the objectives for intervention.

An initial review of transport demand on Anglesey was undertaken to identify potential corridors for the long list of options which identified the importance of Llangefni and Bangor as destinations from Amlwch.

Rail Options

The rail options considered comprise:

- Option 1 - reinstating the former Amlwch to Gaerwen alignment, calling at the former station locations,
- Option 2 - an alternative rail route between Amlwch and Gaerwen, via a new alignment calling at the towns along the north-eastern coast of Anglesey.

For both options, services would call at Llangefni, the county town of Anglesey, and connect to the North Wales Mainline to continue to Bangor.

Bus Options

Bus options which mirror these rail routes have been considered to assess how a bus option would compare to rail, with increased, regular service frequencies and improvements to bus infrastructure.

Incremental Rail and Bus Options

Recognising the high capital cost of new rail infrastructure, a series of smaller rail schemes are also included in the long list, which could be incrementally staged to form a full route to Amlwch.

Table 3 lists the long list of options with further detail regarding the options, rolling stock assumptions and service frequencies found in the main SOC report. Active travel options have not been included within the long list, although they could be considered alongside any of the options at a later stage.

Table 3 – Long List of Options

Ref	Option	Description
Full Route Options		
1a	Rail Option 1	Reinstatement of the former alignment between Amlwch and Gaerwen, connecting into the North Wales Mainline to serve Bangor (28km new route)
1b	Rail Option 2	A new alignment between Amlwch and Gaerwen via a coastal route, connecting into the North Wales Mainline to serve Bangor (32km new route)
2a	Bus Option 1	An inland bus route from Amlwch to Bangor via Llangefni, broadly following Rail Option 1
2b	Bus Option 2	A coastal bus route from Amlwch to Bangor via Llangefni, broadly following Rail Option 2
Incremental Rail Options		
3a	Spur to Llangefni	A 7km spur from the North Wales Mainline ending at Llangefni, along the former alignment
3b	Extension to Llangwyllog / Llanerch-y-medd / Rhosgoch	A spur from the North Wales Mainline along the former (Rail Option 1) alignment, ending at Llangwyllog (total 11.3km) / Llanerch-y-medd (total 17.6km) / Rhosgoch (total 23.0km)
3c	Extension to Benllech / Moelfre / Pen-y-sarn	A spur from the North Wales Mainline along the new coastal (Rail Option 2) alignment, ending at Benllech (total 17.8km) / Moelfre (total 21.4km) / Pen-y-sarn (total 28.7km)
Incremental Bus Options		
4a	Service to Llangefni	A bus route from Bangor to Llangefni broadly following Option 3a
4b	Service to Llangwyllog / Llanerch-y-medd / Rhosgoch	An inland bus route from Bangor, via Llangefni ending at Llangwyllog / Llanerch-y-medd / Rhosgoch broadly following Option 3b
4c	Service to Benllech / Moelfre / Pen-y-sarn	A coastal bus route from Bangor, via Llangefni ending at Benllech / Moelfre / Pen-y-sarn broadly following Option 3c

Figure 8 – Rail Options

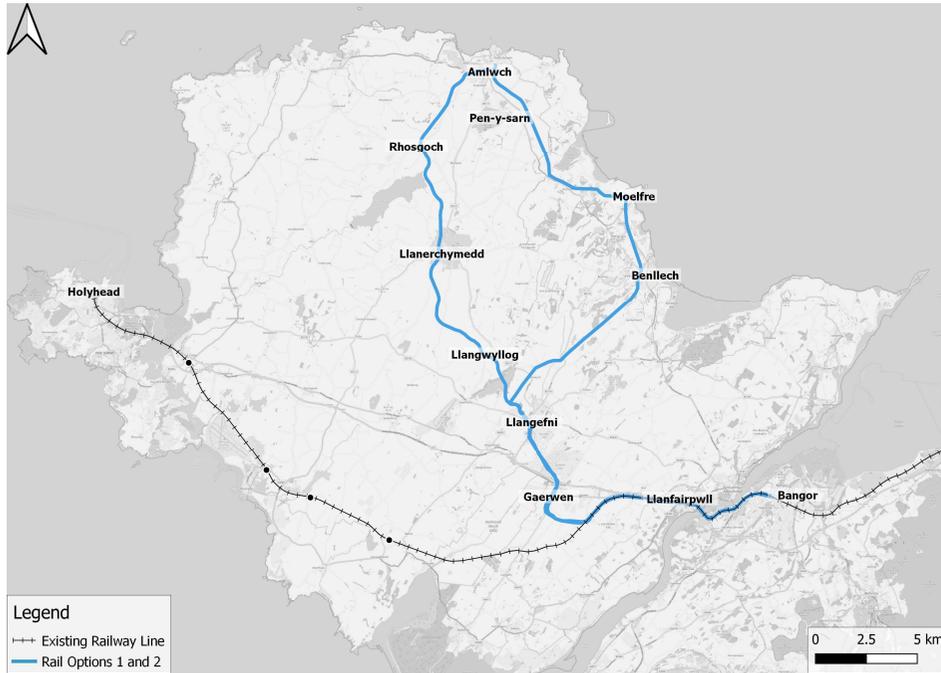
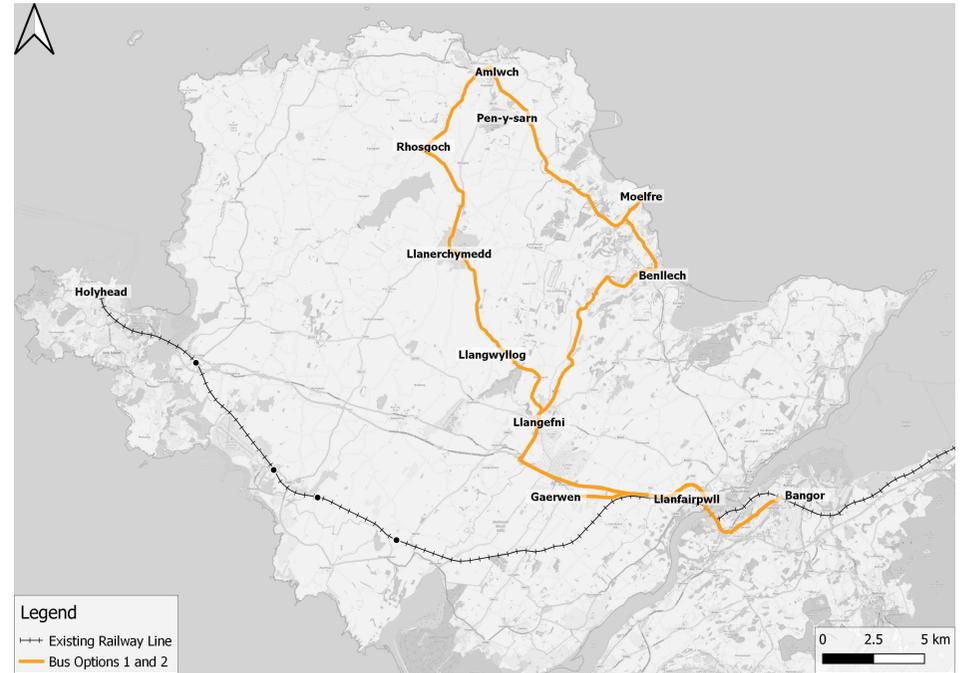


Figure 9 – Bus Options



3. Economic Case

This section describes how each long list option performs against a set of assessment criteria and guides the short-listing of options for further consideration at this stage.

Option Assessment Criteria

The option assessment criteria used at this stage comprise:

Scheme Objectives

The scheme objectives established through the development of the Strategic Case (in **Figure 7** above).

WelTAG Impacts

The WelTAG guidance recommends considering the social, cultural, environmental and economic impacts of each option. Based on the WelTAG recommendation and the DfT TAG, the assessment criteria have been defined in **Table 4**.

Critical Success Factors

The HM Treasury Guide to Developing the Project Business Case 2018 defines critical success factors as the attributes essential for successful delivery of the project, against which the initial assessment of the options for the delivery of the project have been appraised, alongside the spending objectives.

The Guide provides a starting point for identifying and agreeing the critical success factors based on the Five Case Model. Those have been tailored to the scheme to arrive at the assessment criteria set out in **Table 5**.

Table 4 – Option Assessment Criteria – WelTAG Impacts

WelTAG Criteria	Impacts relevant to the scheme
Social and Cultural	<ul style="list-style-type: none"> • Safety • Severance • Reliability and resilience • Journey quality • Access to transport services • Personal accessibility
Environmental	<ul style="list-style-type: none"> • Biodiversity • Landscape and townscape • Noise • Local air quality • Historic environment • Carbon and other greenhouse gas (GHG) emissions • Resilience and adaption in terms of climate change
Economic	<ul style="list-style-type: none"> • Journey time • Journey time reliability • Resilience

Table 5 - Option Assessment Criteria - Critical Success Factors (CSFs)

HM Treasury Key CSFs	Description
Potential Value for Money	How well the option optimises public value (social, economic and environmental), in terms of the potential costs, benefits and risks.
Supplier capacity and capability	How well the option: <ul style="list-style-type: none"> • matches the ability of potential suppliers to deliver the required services, and • is likely to be attractive to the supply side.
Potential affordability	How well the option: <ul style="list-style-type: none"> • can be funded from available sources of finance, and • aligns with sourcing constraints.

Options Appraisal

The appraisal of the long list against these criteria shows that **each of the options** would improve on existing public transport journey times, with rail providing quicker journeys than by bus. The inland routes are shorter and therefore quicker than the coastal routes.

The catchment data shows that both the **inland and coastal routes** would provide similar levels of accessibility (population within 20/40/60 minutes) to the key destinations of Llangefni and Bangor, with rail options providing a **larger catchment** than bus options, due to the quicker journey times.

The trip estimates indicate that greater patronage would be achieved by the **coastal route** than via the former route due to the larger populations served, and significantly higher by rail than by bus, as shown in **Table 6**. This demand increases with higher service frequencies.

Construction along the former corridor would have fewer **environmental impacts** than the coastal route, and would avoid potential resilience issues and risks associated with proximity to the coast, and mining and quarrying activities.

Bus options are assumed to use **existing infrastructure** and so could potentially be delivered sooner and at lower cost than rail-based options.

The full options appraisal is contained within the TfW SOC.

Table 6 – Trip Estimates

Trips per day (16h)	0.5 tph	1 tph	2 tph
Rail Option 1 Inland Route	652	1,002	1,280
Rail Option 2 Coastal Route	1,118	1,692	2,108
Bus Option 1 Inland Route	254	277	300
Bus Option 2 Coastal; Route	473	508	542
Rail spur to Llangefni	113	195	271
Bus spur to Llangefni	46	52	58

Scheme Costs

Illustrative capital costs shown in **Table 7** have been developed for the rail options based on the current level of design. These include direct and indirect construction costs, design and project management costs, and optimism bias (56%). Land and Network Rail possession costs are currently excluded, and ongoing operational costs are covered within the Financial Case.

Table 7 – Capital Cost Estimates

Capital Cost Estimates, £m Q3 2022	Heavy Rail	Light Rail
Rail Option 1 Amlwch to Gaerwen – Inland Route	144.3	93.1
Rail Option 2 Amlwch to Gaerwen – Coastal Route	531.6	202.9
Incremental Option – Gaerwen to Llangefni	34.2	22.5

These estimates demonstrate that the reuse of the former (inland) route will require significantly less investment than a new alignment, which also takes a longer route. The heavy rail estimate for the former route is slightly less than the lower range benchmark rate calculated by the Campaign for Better Transport⁵ (£153m - £284m), whereas the

⁵ [case-for-expanding-rail-network.pdf \(bettertransport.org.uk\)](https://www.bettertransport.org.uk/case-for-expanding-rail-network.pdf)

coastal route is significantly more expensive due to extensive civils works required, including a tunnel.

A light rail specification would allow for cost reductions for both routes, predominantly due to a reduction in civil infrastructure achieved through steeper gradients possible for light rail vehicles.

An incremental option would only build part of the route and would therefore be delivered at a lower initial cost (but may result in a higher total cost due to multiple construction phases).

Value for Money & Affordability

Establishing Value for Money (VFM) is about finding the best way to use public resources to deliver policy objectives. All the long list options presented in **Table 3** are expected to bring about benefits that will contribute to resolving the social, economic and transport related issues and challenges that have been outlined in the Strategic Case to a lesser or greater degree, dependent on the scale of the intervention.

A BCR has not been calculated at this stage, however the cost estimates show that the rail options come with the highest capital and operational costs but are expected to deliver the highest benefits.

Incremental rail options provide the opportunity to stage the delivery of a full route with lower costs of implementation and operation.

A bus option is assumed to use existing infrastructure and therefore would have lower upfront infrastructure costs but are likely to deliver lower benefits than rail options.

Short-List & Further Analysis

At this stage there is not a clear preferred option as there will be a trade-off between demand and costs. The rail options typically perform better than the bus options as they bring greater connectivity benefits and achieve a higher potential modal shift.

The coastal route would cost significantly more to construct than reusing the former alignment but the demand analysis indicates that it would also have higher patronage and revenue.

Further analysis of the demand is required at the next stage using the North Wales Transport Model to validate these findings as a simplified model has been used in this analysis.

The short-listed options are therefore:

- Rail Option 1 – the full inland route from Amlwch to Gaerwen
- Rail Option 2 - the full coastal route from Amlwch to Gaerwen
- Bus Option 1 – the inland bus route
- Bus Option 2 – the coastal bus route

The incremental options display a significantly lower level of demand and should be considered as interim stages for the full scheme.

Both heavy and light rail options should be considered as there is significant opportunity for cost savings to be achieved through a light rail solution.

Figure 10 – Extract from Appraisal Table for Short-listed Options

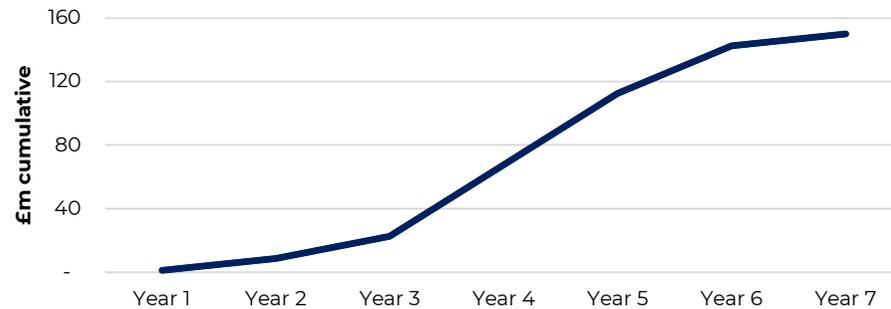
Criteria	Option 1			Option 2			
	a (inland) - heavy rail	a (inland) - light rail	b (inland) - bus	a (coastal) - heavy rail	a (coastal) - light rail	b (coastal) - bus	
Objectives	Improve journey times by public transport between population centres and key employment opportunities, thereby supporting socioeconomic growth in North Wales.	++	++	+	++	++	+
	Reduce carbon impacts and greenhouse gas emissions from transport, thereby adapting to the impact of climate change.	++	++	+	++	++	+
	Better connect local communities by public transport between Amlwch and Bangor to core public services including educational opportunities	++	++	+	++	++	+
	Create an integrated sustainable transport network that is safe, reliable and affordable, providing a realistic alternative to the private car.	++	++	+	++	++	+
	Support the visitor economy in North Wales by improving public transport accessibility to key destinations.	++	++	++	+++	+++	+++
	Support delivery of the North Wales Metro proposals.	+++	+++	+	+	+	+
	WelTAG Impacts	Social & Cultural	++	++	+	++	++
Environmental		-	-	0	-	-	0
Economic		++	++	+	++	++	+
Critical Success Factors	Potential Value for Money	+	+	0	+	+	0
	Supplier Capacity and Capability	++	+	++	++	+	++
	Potential Affordability	--	-	++	--	--	++

4. Financial Case

Budget Profile & Risks

An indicative budget profile for the capital costs is shown in **Figure 11** for Rail Option 1. The timescales align with the outline programme contained in **Table 10** in the Management Case, and is based on approximately two years of further development before construction commences.

Figure 11 – Indicative Budget Profile – Rail Option 1



Key budget risks at this stage relate to:

- Securing development funding,
- Maturity of the design and cost estimates (partially mitigated by application of optimism bias).

Operating Costs

Illustrative annual operating costs shown in **Table 8** have been estimated based on a unit rate for a range of frequencies and vehicle kilometres travelled. These figures are higher than shown in the Better Value Rail (BVR) toolkit guidance and so are considered conservative at this stage. Station operational costs are added to these in **Table 9**, based on £58,000pa per station (following the BVR toolkit).

Table 8 – Vehicle Operating Cost Estimates

Vehicle Operating Cost (£m per annum)	0.5 tph	1 tph	2 tph
Rail Option 1 Inland Route (Heavy Rail)	1.4	2.8	5.6
Rail Option 1 Inland Route (Light Rail)	1.1	2.2	4.4
Rail Option 2 Coastal Route (Heavy Rail)	1.5	3.1	6.1
Rail Option 2 Coastal Route (Light Rail)	1.2	2.4	4.9
Rail Spur to Llangefni (Heavy)	0.6	1.3	2.5
Better Value Rail Toolkit guidance	n/a	1.5 – 2.2	2.3 – 3.5

Revenue & Funding Streams

Illustrative revenue estimates have been calculated from the forecast number of trips, as shown in **Table 9**. The data shows that revenues are not expected to increase as rapidly as operating costs for higher service frequencies.

These estimates also show that an ongoing subsidy will be required as revenues are not expected to cover the operational costs – this position aligns with other services operated in Wales and across the UK. Options for funding will be explored with Welsh Government and the DfT at the next stage.

Table 9 – Mid-Point Revenue Estimates & Funding Shortfall

£m per annum	0.5 tph	1 tph	2 tph
Rail Option 1 Inland Route Revenue	1.2	1.8	2.1
Vehicle & Station Operating Costs	1.7	3.1	5.8
<i>Rail Option 1 Funding Shortfall</i>	<i>(0.5)</i>	<i>(1.3)</i>	<i>(3.7)</i>
Rail Option 2 Coastal Route Revenue	2.0	3.0	3.6
Vehicle & Station Operating Costs	1.8	3.3	6.4
<i>Rail Option 2 Funding Surplus / Shortfall</i>	<i>0.2</i>	<i>(0.3)</i>	<i>(2.8)</i>

5. Commercial Case

Procurement Strategy

At this stage, there are a number of options available for the development, delivery, and operation of the project as summarised in this section.

Further work will be required to refine the procurement strategy and contractual arrangements as the design develops.

Development / Design Phase

Multiple organisations can provide development and design services to TfW and can be procured through competitive tender processes. Specialist firms may be required for novel aspects, such as innovative rolling stock solutions.

The next stage in the development of the scheme, the WelTAG Stage 2 Outline Business Case would be delivered through the existing TfW Engineering Consultancy Services (ECS) framework.

TfW has mature governance arrangements in place for project development and would remain the client for the scheme with continued Network Rail involvement.

The scheme would follow Network Rail's development and delivery requirements through the application of the TfW Plan of Work stages (shown in **Appendix A**), which align with Network Rail's PACE process.

Delivery Phase

Infrastructure

Construction of new permanent way infrastructure, stations, bridges, crossings, railway systems, and the connection to the existing North Wales Mainline will be required to operate the services.

These works could be delivered through Network Rail (or its successor), by a contractor, or by TfW, should TfW wish to undertake the role of Infrastructure Manager for the operational phase.

Rolling Stock

Rolling stock options for a new service between Amlwch and Bangor have been considered which cover scenarios from operating diesel rolling stock (per the North Wales Mainline) to more innovative options. These comprise:

- Expanding existing TfW fleets;
- Legacy DMU cascades;
- Battery retrofitted legacy EMUs;
- Innovative solutions (e.g. tram-trail, RVLR).

Each would require a different procurement approach with differing levels of complexity. The decision on rolling stock type, particularly if a different fleet is introduced, will also have implications for stabling and maintenance locations which may require additional servicing infrastructure.

Operational Phase

Infrastructure Manager

Responsibility for management of the infrastructure will either be held by Network Rail (or its successor), or could be undertaken by TfW (or its contractors), similar to the Core Valley Lines.

Services

Since February 2021, rail services in Wales have been operated by TfW Rail as a nationalised operator. The new rail service would therefore likely be delivered by TfW, but could also be contracted out to another operator.

6. Management Case

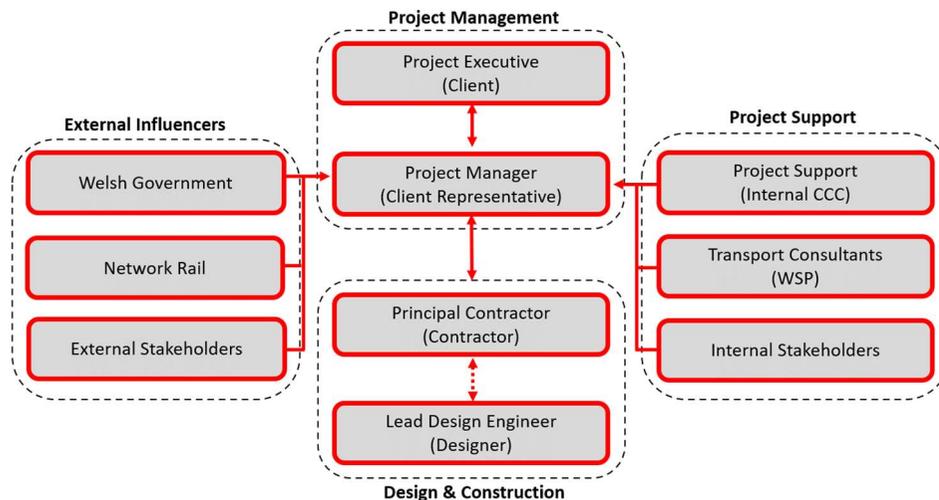
Governance & Structure

TfW, working on behalf of Welsh Government has led the development of this SOC and will continue in this role for the development phase.

Should delivery funding be secured, the project would be taken forward under the TfW North Wales Metro Programme which is delivering rail, bus and active travel improvements across North Wales.

An example governance structure for the project management and delivery of this project is shown in **Figure 12** below.

Figure 12 – Organisation Structure



A decision on the next steps following the submission of this SOC will be taken by the RYR Panel, comprising representatives from DfT, HM Treasury and MHCLG.

Programme & Delivery Plan

Further development funding is required to develop the Business Case through the Welsh Transport Appraisal Guidance (WelTAG) Stages Two and Three (OBC and FBC).

Indicative timescales are shown in **Table 10** below, subject to funding and further refinement:

Table 10 – Programme for Delivery

Milestone	Dates / Approximate Durations
Submission of SOC	September 2022
WelTAG Stage Two - OBC	12 months
WelTAG Stage Three - FBC	12 months
Construction Phase	3 – 4 years
Services Operational	~ 6 years

Key Risks

A risk register has been developed to capture risks identified at this stage of the project, which will be reviewed, updated and managed by the project team as the scheme develops. The key risks at this stage are:

- Technical risks:
 - Timetabling or capacity works on the existing mainline (i.e. crossover / additional platform at Bangor) may be required to operate a 1 tph service with the December 2022 timetable – to be reviewed further at OBC stage
- Funding risks:
 - DfT approval required to proceed post-SOC stage
 - Ongoing subsidy funding will be required

Appendix A – TfW Plan of Work

