South Wales Trunk Road Agent

Managing and Improving Motorways and Trunk Roads through South Wales

Asiant Cefnffyrdd De Cymru

Rheoli a Gwella'r Traffyrdd a'r Cefnffyrdd yn Ne Cymru

A40 Carmarthen to St Clears

WelTAG Stage Two Report

Yn gweithio ar ran Llywodraeth Cymru
Working on behalf of the Welsh Government

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A40 Carmarthen to St Clears

WelTAG Stage Two Report

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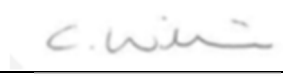
Checked:	Chris Williams		29/11/2021
Approved:	Jon Robinson		29/11/2021
South Wales Trunk Road Agent			
	Name	Signature	Date
Reviewed by:			

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1. Introduction

1.1. Overview

Atkins Limited have been commissioned by the South Wales Trunk Road Agent (SWTRA) to undertake a study of potential improvements along the A40 between Carmarthen and St Clears, under the Welsh Transport Appraisal Guidance (WelTAG) framework (2017). This follows the completion of a Stage One study that identified the key transport problems, set out Transport Planning Objectives (TPOs), and recommended a number of work packages for further consideration as part a Stage Two study. This WelTAG Stage Two study is considered as a safety driven study, on account of the transport problems that have been identified through Stages One and Two.

The A40 connects key settlements in west Carmarthen and Pembrokeshire to Carmarthen, and is a key section of the trunk road network, ultimately linking to the M4. The efficient and safe operation of this section is therefore of primary importance for the Welsh Government / SWTRA as the Strategic Highway Authority.

It is pertinent to note that WelTAG studies are being undertaken alongside the A40 Carmarthen to St Clears WelTAG Stage Two study for adjoining sections of the trunk road network.

The location of the scheme area is illustrated in **Figure 1-1**.

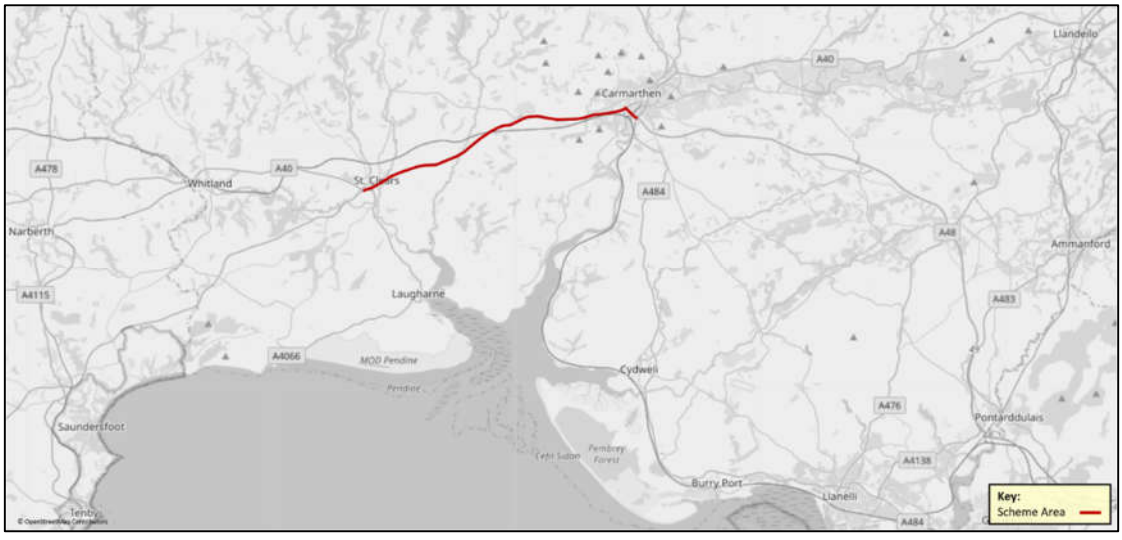


Figure 1-1 *A40 Carmarthen to St Clears WelTAG Scheme Area*

1.2. WelTAG Stages Two

WelTAG is an appraisal framework that covers the lifecycle of a potential intervention in the transport system, from an original assessment of the issues through to implementation and evaluation of a proposed scheme.

The WelTAG process is separated into five stages, which are presented in **Figure 1-2**.

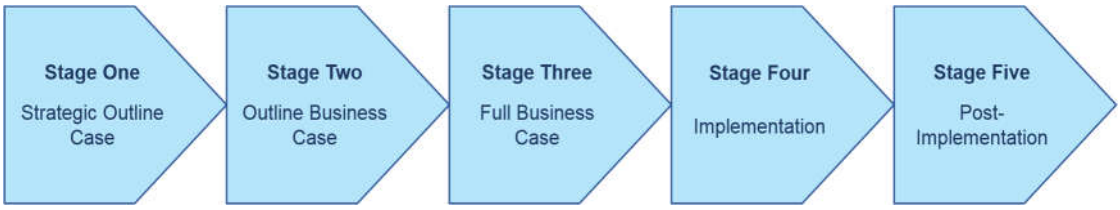


***Figure 1-2** WelTAG Process*

The purpose of a WelTAG Stage Two is to further examine the short-list of options proposed to address the transport problems identified. At the conclusion of WelTAG Stage Two, a preferred solution(s) should be identified to progress to WelTAG Stage Three.

Due to the corridor nature of this study, the potential measures have been considered at a proportionate level of detail, with a number of deliverable schemes recommended for consideration at Stage Three.

1.3. Well-being of Future Generations (Wales) Act

The Well-being of Future Generations (Wales) Act 2015 requires public bodies to consider the long-term impact of decision-making, to ensure the well-being of future generations is assessed within the decision-making process. The Act plays a fundamental role in shaping scheme appraisal in Wales, with WelTAG updated in 2017 to state that WelTAG studies should explicitly consider the well-being of future generations within the development and appraisal of potential interventions.

WelTAG outlines that the five ways of working, as set out in the Well-being of Future Generations (Wales) Act 2015, are required to be followed in order to ensure the long-term suitability of any potential intervention. This WelTAG study has been developed in line with the five ways of working, which are illustrated in **Figure 1-3** and described as follows:

1. Looking to the **long-term** so that we do not compromise the ability of future generations to meet their own needs;
2. Understanding the root causes of issues to **prevent** them from occurring or getting worse;
3. Taking an **integrated** approach so that public bodies look at all the well-being goals in deciding on their well-being objectives;
4. **Involving** a diversity of the population in the decisions that affect them; and
5. Working with others in a **collaborative** way to find shared sustainable solutions.

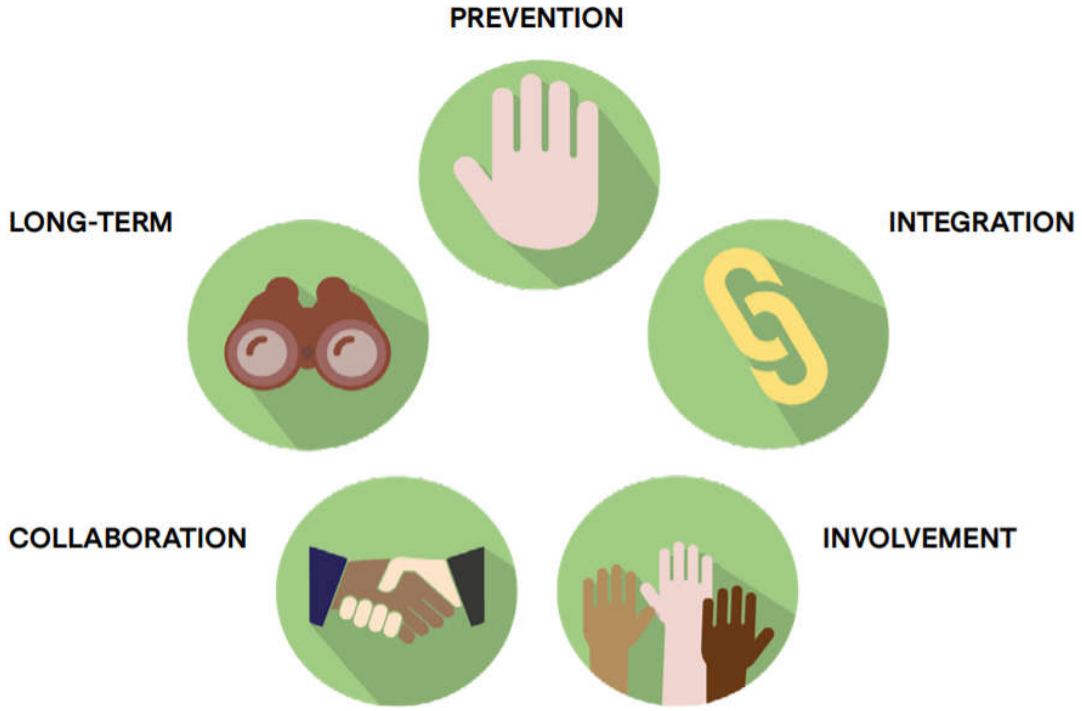


Figure 1-3 *Well-being of Future Generations (Wales) Act – Five Ways of Working*

Further to the five ways of working, the Well-being of Future Generations (Wales) Act 2015 identifies seven national well-being goals to ensure the sustainability of development and to safeguard the well-being of future generations. In addition to the national well-being goals, all public bodies are required as part of the Act to develop a set of local well-being goals to supplement the national goals.

Although WelTAG sets the requirements for the Well-being of Future Generations (Wales) Act 2015 to be explicitly considered within WelTAG studies, the specific details of how to reflect this in reality is not fully prescribed. In order to ensure consistency with WelTAG, Atkins have developed the WellApp Framework, which is a Well-being of Future Generations (Wales) Act Appraisal Framework that sets out the required considerations from the Act at the different stages of WelTAG.

The WellApp Framework, which includes the requirement for the five ways of working to be undertaken at all times, is provided in **Figure 1-4**.

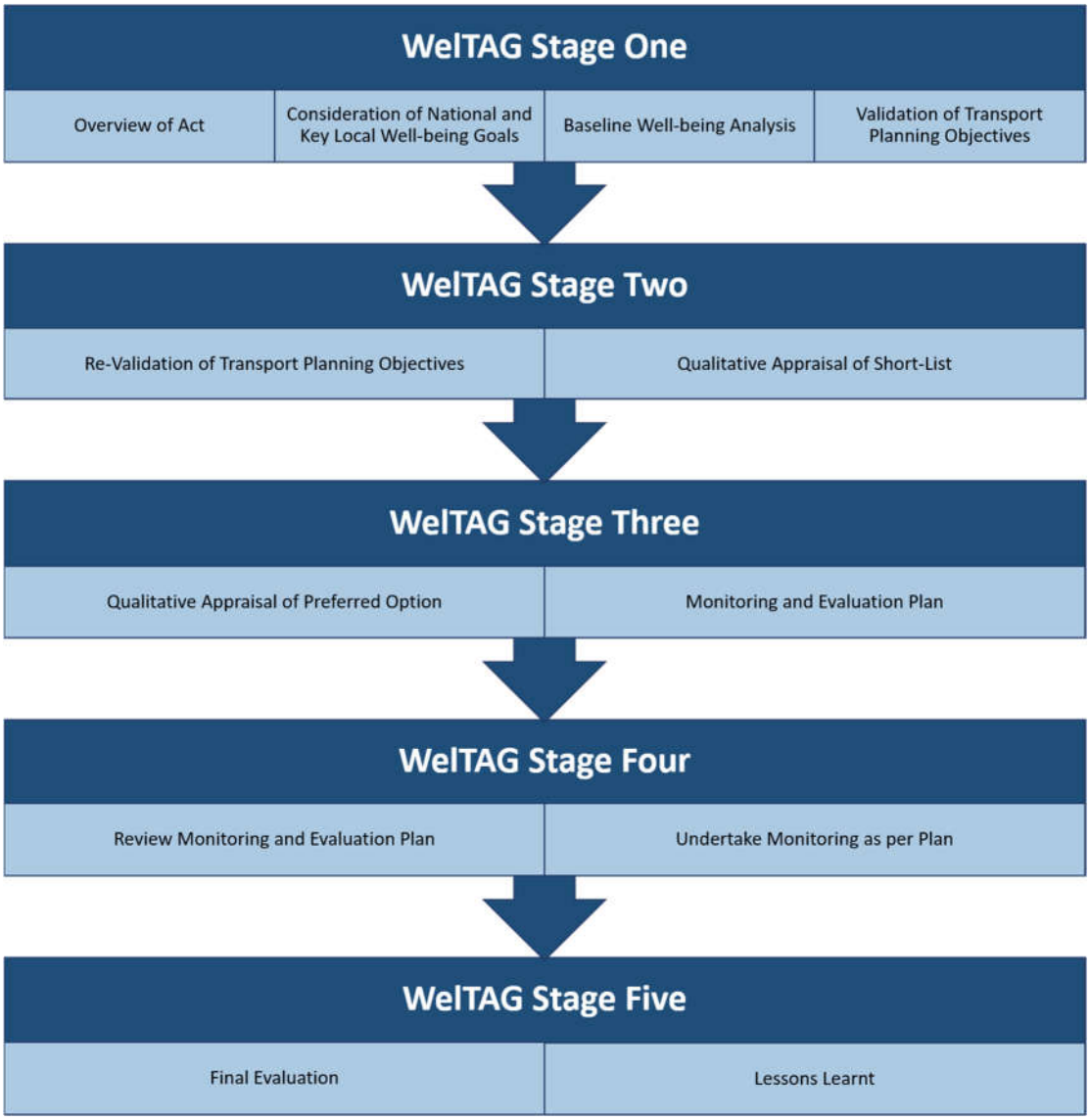


Figure 1-4 *WellApp Framework*

The two WellApp actions at WelTAG Stage Two are provided at the following locations:

- Re-Validation of Transport Planning Objectives – **Section 2.6.1**; and
- Qualitative Appraisal of Short-List – **Chapter 3**.

1.4. Seven-Point Scale

In line with WelTAG, the significance and scale of impacts has been scored in line with the following seven-point scale, using a combination of qualitative and quantitative analysis:

- Large Beneficial (+ + +);
- Moderate Beneficial (+ +);
- Slight Beneficial (+);
- Neutral (0);
- Slight Adverse (-);
- Moderate Adverse (- -); and
- Large Adverse (- - -).

1.5. Structure of Report

This WelTAG Stage Two report is structured in accordance with the Five-Cases model, in order to provide decision-makers with confidence that there is an established need for a scheme. This report is therefore structured as follows:

- **Chapter 2** summarises the **Strategic Case**;
- **Chapter 3** presents the **Transport Case**, which validates the findings of the assessments undertaken;
- **Chapter 4** provides a summary of the costs associated with the short-list options, demonstrating the **Financial Case**;
- **Chapter 5** sets out the **Commercial Case**, summarising the potential procurement options;
- **Chapter 6** outlines the potential routes to delivery and management strategy following construction, forming the **Management Case**; and
- **Chapter 7** provides the potential **Next Steps** and a **Summary and Conclusion**.

2. Strategic Case

2.1. Introduction

This Chapter outlines the case for change for the A40 Carmarthen to St Clears scheme area, building on the findings from the previous stage, and provides a summary of the legislative and policy context of the scheme. The process of developing options to assess at this stage of the study is also described.

2.2. Scheme Area

2.2.1. Overview

The A40 is a key route on the strategic highway network in south Wales, linking Fishguard in the west to Monmouth in the east, via a number of significant employment and residential settlements across the region. In the context of this study, the A40 is a key route between St Clears, onward links to the key strategic ferry ports in Pembrokeshire and important regional population centres such as Haverfordwest in the west, and Carmarthen in the east, linking to the A48 and subsequently the M4.

The scheme area considered at WelTAG Stage One is the 15km two-lane dual carriageway section of the A40 that runs between the Pensarn Roundabout in the east and the St Clears Roundabout in the west. This dual carriageway section of the A40 also includes the large at-grade Pont Lesneven Roundabout, which is located approximately 700m from the Pensarn Roundabout.

The scheme area is primarily rural in nature, except for at the eastern end where the road runs through the Johnstown area of Carmarthen, acting as the western gateway to the town. Further to the west, the scheme area provides access to a number of smaller settlements such as Bancyfelin and St Clears, and local businesses via primarily at-grade junctions.

As described in Section 2.8.1, this study considers the scheme area to the west of Carmarthen, consisting of the A40 between Travellers Rest (J6)[1] and the High Street Slips (J40) in St Clears. It should be noted that the remaining areas of the Stage One scheme area are the subject of separate WelTAG Stage Two studies.

The location of the scheme area is illustrated in **Figure 2-1**.

[1] Junction reference refers to the numbering of junctions provided in ***Table 2-1***.

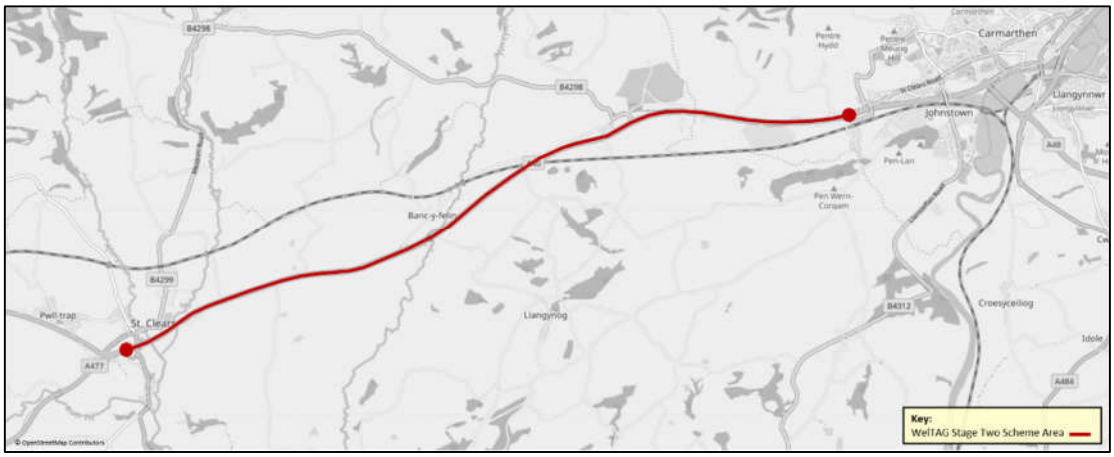


Figure 2-1 *A40 Carmarthen to St Clears Scheme Area*

2.2.2. Junctions

There are a significant number of minor at-grade junctions within the scheme area. The locations of the junctions within the scheme area are illustrated in **Figure 2-2**[2], with the form of the junctions summarised in **Table 2-1**[3].

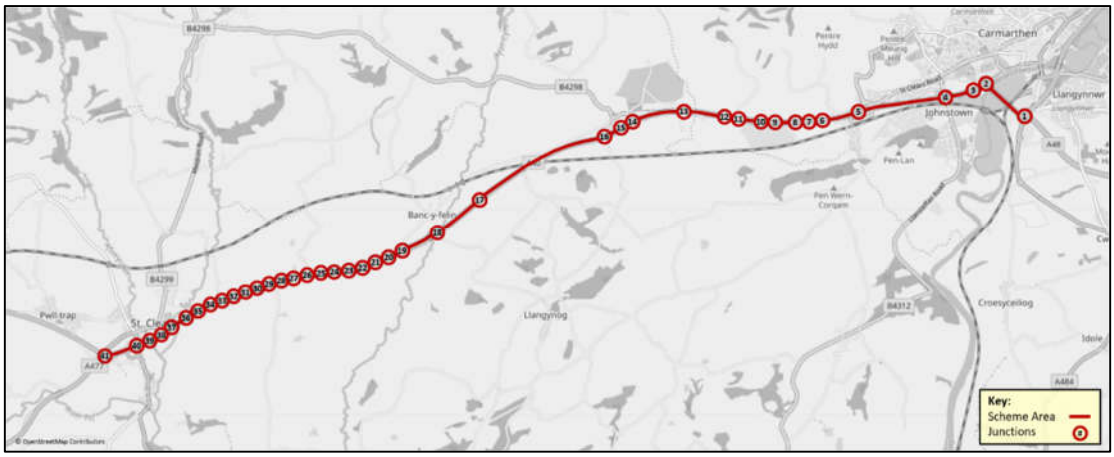


Figure 2-2 *Locations of Junctions*

[2] It should be noted that the scheme area illustrated in this figure refers to the scheme area assessed as part of the WelTAG Stage One study.

[3] The junctions not included within the scope of this WelTAG Stage Two study have been greyed out within the table.

Ref.	Name	Description	Ref.	Name	Description
J1	Pensarn Roundabout	Four-Arm Signalised Roundabout	J23	Private Access / Agricultural Access	Priority All Movement Crossroad
J2	Pont Lesneven Roundabout	Four-Arm Roundabout	J24	CLH Storage	Priority All Movement Junction
J3	B&Q	Priority Left-in / Left-out Junction	J25	Private Access	Priority Left-in / Left-out Junction
J4	Johnstown Slips	Grade-Separated Westbound Left-in / Left-out Slips and Eastbound On-Slip	J26	Bron-y-Gaer / Private Access	Priority All Movement Crossroad
J5	Travellers Rest	Grade-Separated Left-in / Left-out Slips	J27a	Private Access	Priority Left-in / Left-out Junction
J6	Market Hall Vets	Priority Left-in / Left-out Junction	J27b	Agricultural Access	Priority Left-in / Left-out Gated Access
J7	Private Access[4]	Priority Left-in / Left-out Junction	J28	Private Access / Eglwys Llanfihangel Abercowin	Priority All Movement Crossroad
J8	Western Power	Priority Left-in / Left-out Junction	J29a	Private Access	Priority Left-in / Left-out Junction
J9	Private Access	Priority All Movement Junction	J29b	Forge Restaurant, Lodge and Filling Station	Priority Left-in / Left-out Slips
J10	Carmarthen Showground	Left-in / Left-out Slips	J30	Agricultural Access	Priority Left-in / Left-out Gated Access
J11	Ffoshelig Coaches / Agricultural Access[5]	Priority All Movement Crossroad	J31	Private Access	Priority Left-in / Left-out Junction
J12	Tenby Road Filling Station	Priority Left-in / Left-out Slips	J32	Agricultural Access	Priority Left-in / Left-out Gated Access
J13	Golf Club / Private Access	Priority All Movement Staggered Crossroad	J33	Private Access	Priority Left-in / Left-out Junction
J14	Meidrim	Priority All Movement Junction	J34	Waunbricks	Priority All Movement Junction
J15	Agricultural Accesses	Priority All Movement Gated Accesses	J35	Agricultural Access	Priority Left-in / Left-out Gated Access
J16	Private Access / Bragty	Priority All Movement Crossroad	J36	Coast to Coast Caravans	Priority All Movement, Except for Right-Turn Out, Junction
J17	Agricultural Accesses	Priority All Movement Gated Accesses	J37	Pentre Road Slip	Eastbound On-Slip
J18	Private Access / Llangynog	Priority All Movement Crossroad	J38	Agricultural Access	Priority Left-in / Left-out Gated Access
J19	Bancyfelin	Priority All Movement Junction	J39a	Agricultural Access	Priority Left-in / Left-out Gated Access
J20	Private Access	Priority Left-in / Left-out Junction	J39b	Agricultural Access	Priority Left-in / Left-out Gated Access
J21	Private Access	Priority All Movement Junction	J40	High Street Slips	Grade-Separated Westbound Off and Eastbound On-Slips
J22	Private Access	Priority All Movement Junction	J41	St Clears Roundabout	Four-Arm Roundabout

***Table 2-1** List of Junctions*

[4] 'Private Access' refers to a minor road junction that provides access to private property.

[5] 'Agricultural Access' refers to junctions where a minor access (typically via a gated access) is provided to a field directly from the A40.

2.3. Schemes Under Development

2.3.1. Overview

In addition to this WelTAG study, it should be noted that there are a number of WG schemes now under development within the A40 Carmarthen to St Clears scheme area, but outside of this study. It is also pertinent to note that there are some studies being undertaken on the adjoining strategic road network links.

2.3.2. A40 Bancyfelin to St Clears Shared-Use Path

This WG funded scheme is located on the CCC Integrated Network Map (INM), which details proposed improvements to the active travel network over the next 15 years. It is considered that this scheme delivers an element of Option AT4 (Development of the CCC INM Routes) which was identified at WelTAG Stage One. The scheme is currently at the detailed design stage, with a funding commitment to construct the scheme secured, once the design is agreed.

2.3.3. Stabilisation of A40 Surrounding the Carmarthen Showground

Works to stabilise the ground in this location was included as part of Option VI19 (Stabilisation of the Carmarthen Showground Slips) at WelTAG Stage One. Since the Stage One element of this study was complete, ground investigations and potential solutions have been progressed outside of this WelTAG process; funding has been secured to continue with the ground investigation, with decisions on future resolutions dependent on the outcome of this.

2.3.4. A48 Cross Hands to Pensarn

In addition to the schemes summarised above, it should be noted that a WelTAG Stage Two study has been completed for the A48 between Cross Hands and Pensarn, directly to the east of Carmarthen.

As part of this, a range of potential options were investigated, with a preferred package of recommendations for further assessment, which included closure of a number of gaps in the central reservations, the construction of a grade-separated junction at Nantycaws, amendments to non-emergency stopping provision and bus laybys, and the rationalisation of pedestrian crossings.

2.4. Stakeholder Engagement

2.4.1. Overview

In line with the involvement and collaboration aspects of the five ways of working set out within the Well-being of Future Generations Act, the views of key stakeholders have been sought on the following from the WelTAG Stage One study:

- Transport Problems and TPOs;
- Work Packages;
- Any other options that require further consideration; and
- Any other comments for consideration.

The programme of engagement involved the distribution of engagement packs to a list of key stakeholders, that were primarily identified as part of the WelTAG Stage One study and agreed with Welsh Government and SWTRA. The full list of key stakeholders was inclusive of:

- CCC and Local Councils;
- Welsh Government's Area Manager, Road Safety Engineer, Highways Development Management Team and Climate Change Programme Manager;
- TfW;
- Emergency Services;
- Local Assembly Member and Member of Parliament;
- Sustrans;
- Public Transport Groups and Operators; and
- Environmental and Heritage Groups.

A snapshot of the engagement packs issued to key stakeholders is provided in **Figure 2-3**.

Figure 2-3 *Stakeholder Engagement Packs*

In addition to the stakeholder engagement, feedback has been sought from specific stakeholders during the process of developing the list of options. Detail as to the feedback received during option development is provided within the relevant sections in the following Chapters.

2.4.2. Stakeholder Feedback

A total of eight responses have been received from key stakeholders, with broad themes being summarised in

Table *2-2*.

Feedback Topic	Key feedback points
Transport Problems and Transport Planning Objectives	• It is a dangerous road, getting worse as the volume of traffic is increasing with holidaymakers. HGVs and agricultural machinery face difficult situations and cross overs are risky. • no safe/direct route for cyclists from St Clears to Carmarthen • bus travelling westbound from Bancyfelin has difficulty accessing A40 (B4298) • Slow farm traffic especially at peak times • Too many junctions and not well enough lit • Too many crossovers • Sub standard laybys and the inappropriate location of these along the A40 plus the restrictions to and limited active travel linkages. • Carmarthenshire Showground westbound exit/entry slips and access road, have geotechnical stability issues and should be investigated • Due to the high volumes of tourist traffic, speed of the road and mixture of heavy and agricultural vehicles the cross over sections throughout the route represent an area that should be looked at to minimise the risk of conflict of movements throughout the length of this study
Work Packages	• Work packages generally supported. • Improvements to the highway need to concentrate on safety issues
Other Options	• New bike path • Longer slip roads • Close some cross overs – eg permanent barrier westbound before London Road Filling Station • Make westbound right turn across carriageways to Bancyfelin safer (longer filter lane or 3rd lane/better signage) • A local business stated that any improvement would be very welcome.
Any Other Comments	• Any modifications to the site either eastbound or westbound could lead to a situation where vehicles would find another junction to u-turn which could lead to a more dangerous situation. • where opportunities are identified to reduce carbon impacts during the implementation and future maintenance of the preferred option(s),

Table 2-2 *Summary of Stakeholder Feedback*

2.5. Policy Context

Although a review of the national, regional and local policy context was undertaken as part of A40 St Clears to Carmarthen WelTAG Stage One, a refresh of the policy context has been undertaken in light of the latest issue of the Wales Transport Strategy (WTS) and the more focused scheme area.

The following policy documents have been considered:

- National:
  - Welsh Language (Wales) Measure and Welsh Language Act;
  - Active Travel (Wales) Act;
  - Planning Policy Wales (Edition 11, February 2021);
  - Technical Advice Note 18: Transport;
  - Well-being of Future Generations (Wales) Act;
  - Llwybr Newydd: the Wales Transport Strategy 2021;
  - National Transport Finance Plan 2018 Update;
  - Taking Wales Forward;
  - Future Wales – The National Plan 2040; and
  - The Clean Air Plan for Wales – Healthy Air, Healthy Wales.
- Regional:
  - Swansea Bay City Deal; and
  - Joint Transport Plan for South West Wales (2015-2020).
- Local:
  - Carmarthenshire Local Development Plan 2006-2021 and Carmarthenshire Deposit Local Development Plan 2018-2033.

It is considered that all policy documents are important in shaping the development of a preferred solution along the A40 corridor and have therefore been reviewed as part of the accompanying IAR. Notwithstanding, the review of the Well-being of Future Generations Act, the latest WTS and the Carmarthenshire Local Development Plan (LDP) has been included within this WelTAG Stage Two report, due to the principal importance of these policies.

2.5.1. Well-being of Future Generations Act

National Well-being Goals

The Well-being of Future Generations (Wales) Act 2015 sets out the requirement for all public bodies to utilise the five ways of working (as set out in **Section 1.3**) and always consider the seven national well-being goals (WBGs) in decision-making. The seven national well-being goals are illustrated in **Figure 2-4** and set out as follows:

WBG1 – A Prosperous Wales

This well-being goal recognises the need for an 'innovative, productive and low carbon society which recognises the limits of the global environment', resulting in the efficient and proportionate use of resources (including acting on climate change).

Furthermore, the goal encourages the development of a 'skilled and well-educated population in an economy which generates wealth and provides employment opportunities', creating a society which allows the population to 'take advantage of the wealth generated through securing decent work'.

WBG2 – A Resilient Wales

The 'resilient Wales' goal creates a vision for a nation which 'maintains and enhances a biodiverse natural environment with healthy functioning ecosystems'. Furthermore, these ecosystems are envisaged to support 'social, economic and ecological resilience and the capacity to adapt to change', with specific reference made to climate change.

WBG3 – A Healthier Wales

The 'healthier Wales' goal centres on the vision for a 'society in which people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood'.

WBG4 – A More Equal Wales

This goal focuses on achieving equality through a 'society that enables people to fulfil their potential no matter what their background or circumstances'. This includes, amongst other criteria, 'their socio-economic background and circumstances'.

WBG5 – A Wales of Cohesive Communities

The 'Wales of cohesive communities' goal seeks to achieve 'attractive, viable, safe and well-connected communities' for future generations in Wales.

WBG6 – A Wales of Vibrant Culture and Thriving Welsh Language

This goal focuses on the retention and projection of culture through the use of the arts and the Welsh language. It states that the overall goal consists of a 'society that promotes and protects culture, heritage and the Welsh language, and which encourages people to participate in the arts, and sports and recreation'.

WBG7 – A Globally Responsible Wales

This goal outlines the importance of improving the 'economic, social, environmental and cultural well-being' at a county-wide level in Wales. Furthermore, it promotes the 'positive contribution to global well-being' as a result of being economically, socially, environmentally and culturally responsible in Wales.

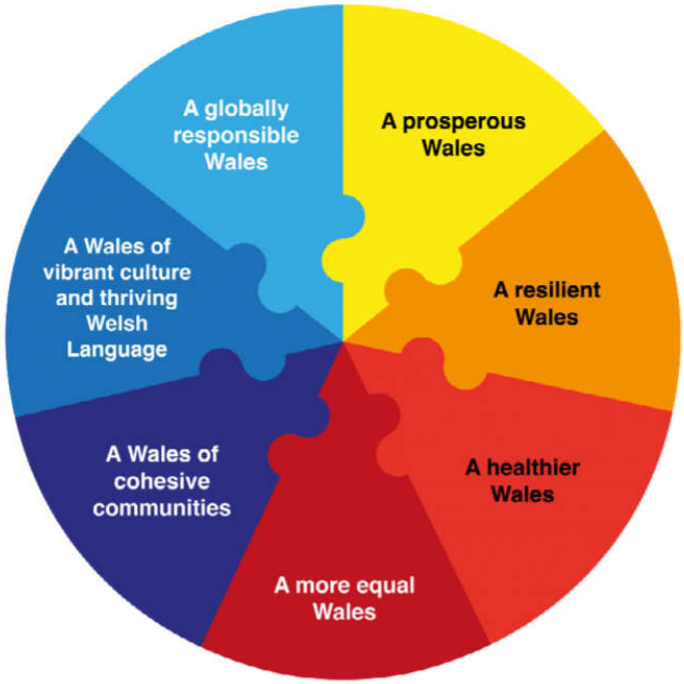


Figure 2-4 *Seven National Well-being Goals – Well-being of Future Generations (Wales) Act*

Local Well-being Goals

In addition to the seven national well-being goals, the Well-being of Future Generations (Wales) Act 2015 sets out the requirement for all public bodies to adopt local well-being goals (LWBG) for their organisations. Within Carmarthenshire, as set out within the Carmarthenshire Well-being Plan[6], the Carmarthenshire Public Services Board has identified the following four well-being goals for the county:

LWBG1 – Healthy Habits

Ensure people have a good life and make healthy choices about their lives and environment.

LWBG2 – Early Intervention

Make sure that people have the right help at the right time; as and when they need it.

LWBG3 – Strong Connections

Provide and maintain strongly connected people, places and organisations that are able to adapt to change.

LWBG4 – Prosperous People and Places

Maximise opportunities for people and places in both urban and rural parts of the county.

[6] Carmarthenshire Public Services Board (2018) *Carmarthenshire Well-being Plan: The Carmarthenshire We Want – 2018-2033.* Available online: http://www.wales.nhs.uk/sitesplus/documents/862/Carmarthenshire%20Well-being%20Plan%20final%20290118.pdf

2.5.2. *Llwybr Newydd: Wales Transport Strategy*

A new WTS was published in 2021, setting out Welsh Government's vision for an accessible, sustainable and efficient transport system, which can contribute to a more prosperous, green and equal society.

The WTS is centred around the principle of achieving an integrated approach to transport, which will ensure that transport can address key issues to deliver wider commitments, through the following four pathways:

- Decarbonisation;
- Equality;
- Integrated Journey Planning; and
- Rural Transport.

The WTS sets out three short-term key priorities and four longer-term well-being ambitions for the transport system in Wales. The priorities and ambitions of the WTS have been developed with reference to the Sustainable Transport Hierarchy illustrated in **Figure 2-5**.

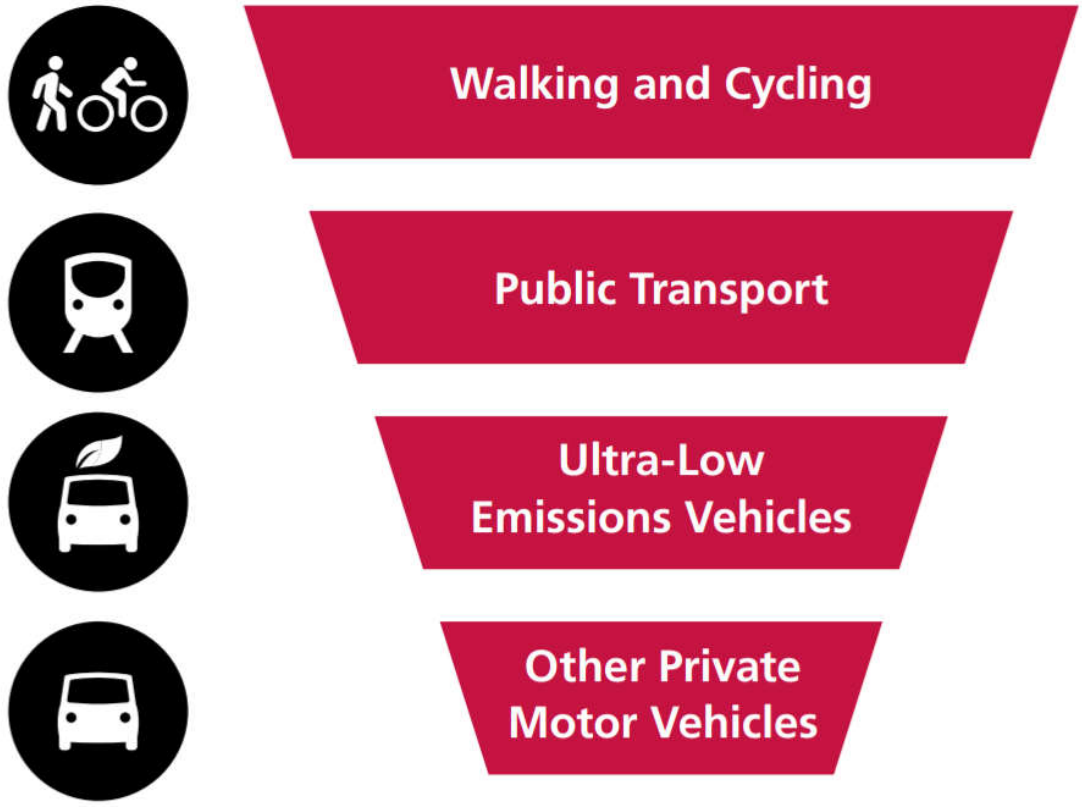


Figure 2-5 *Sustainable Transport Hierarchy – Wales Transport Strategy 2021*

The three key priorities and four well-being ambitions of the WTS are summarised in **Table 2-3**.

Ref.	Headline	Description
Priority 1	Bring services to people in order to reduce the need to travel.	Welsh Government will plan ahead for better physical and digital connectivity, more local services, more home and remote working and more active travel, to reduce the need for people to use their cars on a daily basis. This will be achieved through: • Supporting **remote working** so people can work from an office near their home one or more days a week; • Locating **new public services** close to where people live; • Building new workplaces and homes close to public transport and designing new developments to be **walk and cycle friendly** from the outset; • Ensuring a **joined-up approach to infrastructure investment decisions** across Welsh Government and in regional planning; • Maximising the use of land **close to transport hubs**; • Improving access to **fast and reliable broadband**; and • Setting aside land for **multi-modal hubs** to transfer long-haul freight to smaller vans or e-cargo bikes for last-mile deliveries.
Priority 2	Allow people and goods to move easily from door to door by accessible, sustainable and efficient transport services and infrastructure.	Welsh Government will aim to achieve a shift away from private car use to more sustainable transport modes for the majority of journeys, as well as investing in low-carbon, accessible, efficient and sustainable transport services and infrastructure that enable more people to walk, cycle, use public transport and user low-emissions vehicles. It is intended that Welsh Government will achieve this through providing reliable, efficient and affordable transport services that people want to use, can use and do use. In addition to the above, Welsh Government will seek to provide safe, accessible, well-maintained and managed transport infrastructure, through continuing to make best use of existing transport infrastructure, as well adapting existing infrastructure to adapt to climate change. Furthermore, transport infrastructure will be future-proofed to adapt to climate change and facilitate more sustainable transport choices, whilst where new transport infrastructure is required, the Sustainable Transport Hierarchy will be utilised.
Priority 3	Encourage people to make the change to more sustainable transport.	Welsh Government will encourage people to change their travel behaviour to use low-carbon sustainable transport, through making sustainable transport more attractive and more affordable, as well adopting innovations that make it easier to use. This will be achieved through: • Developing a range of **behaviour-change projects** to encourage smarter travel choices; • **Transforming the customer experience** of public transport; • Moving away from individual vehicle ownership to **shared solutions**; • Developing a framework for **fair and equitable road-user charging** in Wales and investigating other disincentives to car use; • Using new revenue sources to fund large improvements in **public transport services and active travel facilities**; • **Reducing the cost of sustainable travel** through a range of initiatives; • Supporting digital innovations and looking at options for a transport 'open data' store to **improve journey planning**; • Getting buy-in at a local level by engaging with communities to design transport interventions that **meet local needs** and circumstances; and • Using education, campaigning, marketing and other tools to **transform the image** of active travel and public transport.
Well-being Ambition 1	Good for People and Communities.	It is intended to develop a transport system that contributes to a more equal and healthier Wales, that everyone has the confidence to use. This Well-being Ambition will be achieved through targeting the following three areas: **Equality** Welsh Government will make transport services and infrastructure accessible and inclusive by aiming to remove the physical, attitudinal, environmental, systemic, linguistic and economic barriers preventing people from using sustainable transport. These barriers will be removed through undertaking a range of actions, including adopting best practice on inclusive design and through staff training and service standards. **Health** Improvements will be made to air quality and environmental noise associated with transport, through pursuing modal shift, encouraging more active travel, greater use of public transport and low-emissions vehicles, and by creating close links between land-use planning and transport; in line with the commitments set out in the **Clean Air Plan for Wales: Healthy Air, Healthy Wales** and the **Noise and Soundscape Action Plan**. In addition, Welsh Government will contribute to higher activity levels through making healthy transport options more attractive, affordable, prominent, and accessible; in line with the commitments set out in **A Healthy Weight, A Healthy Wales**. **Confidence and Safety** Welsh Government want everyone to feel confident, safe, secure and welcome using sustainable transport modes, which will be achieved through improving journey planning information, using digital approaches, and addressing personal safety of public transport.

Ref.	Headline	Description
Well-being Ambition 2	Good for the Environment.	A transport system will be developed that delivers a significant reduction in greenhouse gas emissions, maintains biodiversity and enhances ecosystem resilience, and reduces waste. This Well-being Ambition will be achieved through targeting the following three areas: **Greenhouse Gas Emissions** A reduction in greenhouse gas emissions from transport will be achieved through reducing demand, supporting low-carbon services and infrastructure, and through modal shift in line with the UK Climate Change Committee recommendations, commitments on net zero and through the five-yearly **Wales Carbon Budgets**. **Biodiversity and Ecosystem Resilience** Maintaining and enhancing biodiversity, as well as increasing ecosystem resilience through transport and infrastructure projects will be achieved through managing the existing transport network and through the design and delivery of transport interventions, in line with the **Natural Resources Policy**. **Waste** Better use of existing transport infrastructure will be made to reduce waste associated with transport, through reducing the need for new infrastructure.
Well-being Ambition 3	Good for the Economy and Places in Wales.	Welsh Government will develop a transport system that contributes to wider economic ambitions and helps local communities, supports a more sustainable supply chain, uses the latest innovations and addresses transport affordability. This Well-being Ambition will be achieved through targeting the following four areas: **Cohesive Communities** Welsh Government want a transport system that helps local communities by meeting the needs of different parts of Wales, including rural areas. In line with the **Future Wales – the National Plan 2040**, Welsh Government will use the Sustainable Transport Hierarchy when planning new developments and transport solutions, tailored to the needs of different communities and parts of Wales. **Innovation** Welsh Government will support operational, technological and digital innovations that enable and encourage more people to use sustainable transport, which could mean that people do not always need to own a car. Of particular note, it is outlined that digital innovations will be embraced and that there is an aspiration that Wales will be a centre for innovative technology such as hydrogen, electric and hybrid design and production that reduces carbon emissions from transport. **The Distribution of Goods** It is intended to work with businesses and the UK Government to create a more sustainable system of distributing goods in Wales, which will involve encouraging more freight by rail, planning for the future of the Welsh supply chain through logistics hubs, innovations and shared transport solutions, and working with relevant sectors to address the impact of increases in last-mile deliveries. **Affordability** Welsh Government will make sustainable transport options more affordable through taking affordability into account in planning new transport interventions. It is acknowledged that for some people – particularly those in rural areas – there may be fewer transport choices and therefore there may be a need to provide alternatives such as shared car schemes or other options that meet the particular needs of these communities.
Well-being Ambition 4	Good for Culture and the Welsh Language.	Welsh Government will deliver a transport system that supports the Welsh language, enables more people to use sustainable transport to get to arts, sport and cultural activities, and protects and enhances the historic environment. This Well-being Ambition will be achieved through targeting the following three areas: **The Welsh Language** Welsh Government will help the Welsh language to thrive through encouraging commercial and third sector operators to increase the use of Welsh on services and in the workplace, in transport information and digital services, in addition to aiming for equality of provision in transport access to Welsh-language education. **Arts, Sport and Culture** It is intended that more people can enjoy arts, sports and natural / cultural heritage in Wales using sustainable transport, through joining up planning for transport and major events, and working with Visit Wales to promote transport heritage attractions, in line with the **Welcome to Wales – Priorities for the Visitor Economy 2020-2025** document. **Historic Environment** The historic environment will be protected and enhanced in transport asset management, operations and interventions, in line with statutory planning policies and the **Priorities for the Historic Environment**.

Table 2-3 *Key Priorities and Well-being Ambitions – Wales Transport Strategy*

A comparison of the Well-being Ambitions with the seven national well-being goals of the Well-being of Future Generations Act is illustrated in **Figure 2-6**.

Figure 2-6 *Ambitions and the Seven Well-being Goals – Wales Transport Strategy 2021*

The WTS also outlines how Welsh Government will achieve the commitments set out within the strategy, as summarised as follows:

1. **Investing Responsibly –** give priority to funding projects and programmes that meet the priorities and ambitions of the WTS, as well as investing in improving the maintenance and management of existing assets. It is also identified that Welsh Government will invest in improving road safety, where appropriate;
2. **Delivery and Action Plans –** work with partners to turn the WTS into action, which includes developing the National Transport Delivery Plan (being developed by Transport for Wales (TfW)), based on a Statement of Funds Available following the next UK Comprehensive Spending Review, preparing Regional Transport Plans, and considering solutions identified by the South East Wales Transport Commission (SEWTC);

3. **Cross-Cutting Delivery Pathways –** develop delivery pathways for the four key cross-cutting areas of decarbonisation, equality, integrated journey planning and the rural offer, which will list the specific commitments of the WTS to the four areas and what needs to be done to achieve them;
4. **Working in Partnership –** work effectively with the UK Government on shared responsibilities, as well as working with and strengthening relationships with a range of other organisations in the sector, including Local Authorities, the National Infrastructure Commission and TfW;
5. **Updating Our Policies and Governance –** update existing guidance and policy to reflect the ambitions and priorities of the WTS, including an update to TAN 18: Transport, as well as explore any other governance improvements; and
6. **Skills and Capacity –** build capacity and skills within Welsh Government, in partners such as Local Authorities and in delivery organisations.

In addition to setting out the key priorities, ambitions and cross-cutting pathways, the WTS presents mini-plans which set out how specific transport sectors and modes will deliver the priorities set out in the Strategy. The mini-plans include details of how Welsh Government will work with partners to achieve the priorities and ambitions of the WTS for specific transport sectors and modes, in addition to how the five ways of working will be embedded within decision making relating to specific transport sectors and modes.

Of specific relation to this study, it is noted that the mini-plan for roads, streets and parking identifies that Welsh Government will continue to upgrade, improve and future-proof the road network, investing in schemes that support road safety, resilience and journey reliability.

A summary of the WTS' mini-plans is illustrated in **Figure 2-7**.

Figure 2-7 *Summary of Mini-Plans – Wales Transport Strategy 2021*

2.5.3. Carmarthenshire Local Development Plan

The LDP was adopted in December 2014, superseding the previous Unitary Development Plan. This document guides development in the Authority up until 2021.

At a council meeting on January 10th, 2018 it was agreed to prepare a revised LDP for Carmarthenshire (2018-2033). The preparatory process for an LDP is expected to be completed in 3.5 years. Once adopted, the revised LDP will be used as the basis for guiding future investment programmes and plans.

Within the current adopted LDP, there are several sites that have been allocated for significant development near the settlements of Carmarthen such as West Carmarthen (mixed-use development with up to 1,100 units) and Pibwrlwyd (employment, leisure and education) however none within the scheme area of this WelTAG Stage Two

2.5.4. Summary of Policy Context

A review of the relevant policy indicates that current policy emphasises the importance of considering all road users in the development of transport schemes; noting the Sustainable Transport Hierarchy. Consideration has been given to provision for active travel users as part of this WelTAG process, with changes to the public rights of way (PRoW) network as part of closing or improving at-grade pedestrian crossings.

It is also noted with the mini-plan for roads, streets and parking that Welsh Government will continue investing in schemes that support road safety, resilience and journey reliability, and therefore it is considered that the options under consideration on the A40 are in line with the WTS.

2.6. Case for Change

2.6.1. Transport Problems

The transport problems identified as part of the WelTAG Stage One study are summarised in **Table 2-4**.

Ref.	Transport Problem	Rationale
TPR1	Cross-carriageway manoeuvres at minor road junctions.	Feedback from stakeholders suggests that there is an existing safety concern where minor roads join the A40, particularly for right-turning vehicles crossing oncoming traffic. Some stakeholders also raised concerns about HDVs and agricultural vehicles, which have been observed overhanging the central waiting area when crossing the carriageway.
TPR2	Inadequate layout of minor road junctions.	A number of stakeholders have suggested that there is insufficient acceleration / deceleration space on entry / exit to / from the A40 and therefore it is considered that the length of slip-road is often inadequate for merging / diverging traffic. In addition to this, the number of direct private and agricultural accesses onto the A40 has been raised as a safety concern by stakeholders.
TPR3	Notable collision clusters.	There are a number of collision clusters located within the scheme area, with particularly high collisions rates at Pont Lesneven and in the vicinity of Bancyfelin.
TPR4	Inconsistent slow-moving vehicles.	Stakeholder feedback has suggested that the presence of a number of slow-moving vehicles (typically associated with agriculture) increases the perceived risk of collision, which is considered to be exacerbated by an increase in tourist traffic during the summer months. It is also noted that a number of recorded collisions involved slow-moving agricultural vehicles.
TPR5	Sub-standard laybys.	The majority of laybys within the scheme area are sub-standard. Due to the layout of the laybys, vehicles are required to reduce their speeds significantly on the mainline A40, which could increase the potential for collisions.
TPR6	Highway drainage and surfacing.	Stakeholder feedback has suggested that there are instances when standing rainwater is present within the scheme area, while there are a number of locations where the A40 falls within a flood zone.
TPR7	Limited active travel linkages.	The existing cycleway provision does not link into any dedicated infrastructure between the Meidrim (J14) and Private Access / Eglwys Llanfihangel Abercowin (J28) junctions, where there is considered to be a gap in the existing active travel infrastructure provision. In addition, it has been identified that there are two established PRoW which cross the A40 at-grade, which may be considered a safety concern for pedestrians.
TPR8	Limited safe and convenient bus infrastructure and services.	It has been identified that there is currently no bus layby provision at a number of the designated bus stops within the scheme area. It is also noted that there is limited bus service provision in the western area of the scheme area, which is exacerbated by the layout of the Bancyfelin (J19) junction which has led to bus services no longer routing through this junction due to the perceived unsafe manoeuvre.
TPR9	Peak period delay to the east of the Johnstown Slips.	Traffic data and feedback from stakeholders suggests that there is peak period congestion at the eastern end of the scheme area, which can primarily be attributed to the Pensarn Roundabout (J1), Pont Lesneven Roundabout (J2) and the Johnstown Slips (J4) westbound off-slip.

Ref.	Transport Problem	Rationale
TPR10	Seasonal traffic.	Traffic data and stakeholder feedback suggests that the scheme area suffers from some seasonal vehicle delay, particularly during the summer month of August.
TPR11	Poor scheme area resilience.	Feedback from stakeholders has suggested that there is a lack of diversion routes which potentially reduces the resilience of the scheme area to deal with issues such as collisions and scheduled maintenance closures.
TPR12	Limited access to electric vehicle infrastructure.	There is currently limited electric vehicle charging opportunities in the vicinity of the scheme area, which is considered as a barrier to enabling the uptake of electric vehicles in the region.

***Table 2-4** Transport Problems identified at WelTAG Stage One*

Further consideration has been given to these transport problems, with regards to understanding whether the problems are prevalent within the section of the Stage One scheme area that is being considered as part of the work packages included within this WelTAG Stage Two.

2.6.2. TPR1 – Cross-Carriageway Manoeuvres

It was identified at WelTAG Stage One that cross-carriageway manoeuvres present a potential safety concern along this section of the A40, due to the nature of the at-grade junctions, frequency of minor junctions, notable traffic demand and speed.

Further analysis has been undertaken of collisions statistics at each of the junctions over the most recent 10-year period, and it has been identified that 12 of the collisions recorded included, or were associated with a cross-carriageway manoeuvre. Cross carriageway manoeuvre collisions were recorded at:

- J8 Western Power (1 slight);
- J9 Private Access (1 slight);
- J11 Ffoshelig Coaches / Agricultural Access (1 serious, 1 fatal);
- J14 Meidrim (1 slight);
- J18 Private Access / Llangynnog (1 slight, 2 serious);
- J19 Bancyfelin (1 slight, 1 serious); and
- J28 Private Access / Eglwys Llanfihangel Abercowin (2 slight).

This perceived safety concern was also highlighted within both the Stage One and Stage Two stakeholder feedback, and it is considered that appropriate measures to reduce the potential for cross-carriageway collisions should be further investigated as part of this WelTAG Stage Two study. It is considered that reducing the conflict points across the corridor, by minimising carriageway crossing opportunities, will significantly reduce the potential for these types of collisions within the scheme area.

2.6.3. *TPR2 – Inadequate Layout of Minor Road Junctions*

A review of the existing junction layouts and their compliance with key design standards set in Design Manual for Roads and Bridges (DMRB) has been carried out. The assessment considered the following:

- Forward Visibility – From Right Turn Island;
- Horizontal Visibility from Minor Arm (Right-Turn);
- Horizontal Visibility from Minor Arm (Left-Turn);
- Width of Central Reservation;
- Right Deceleration Lane Length; and
- Corner radii.

The review of standards has identified that a number of junctions within the scheme area are non-compliant against current key standards, and collisions have been recorded at a large number of the junctions. Whilst it is acknowledged that some of the minor access junctions are collision free over the last 10 years, it should be noted that the low level of demand at these could be a contributing factor. However, stakeholder feedback has highlighted slow turning vehicles at minor accesses as a perceived issue, and could lead to a negative perception of the corridor in terms of safety and journey quality.

With the above in mind, it is considered that the layouts of the junctions within the scheme area contribute to the potential for collisions and therefore present potential safety concerns, and improvements should be considered on safety grounds as part of this WelTAG Stage Two study.

2.6.4. *TPR3 – Notable Collision Clusters*

At WelTAG Stage One, it was identified that there were a number of collision clusters within the scheme area, with particular clusters identified at a number of the junctions such as in the vicinity of the Bancyfelin junction (J19). To provide a further review of these clusters, data has been analysed for a 10-year period within the study area, with a particular focus on those that are at, or within the vicinity of a junction.

It should be noted that the collision data only records collisions resulting in a casualty and therefore does not capture damage-only collisions and near misses experienced within the scheme area.

A summary of the total recorded collisions at, or close to a junction, within the scheme area is provided in **Table 2-5**, with the locations of all collisions within the study area, including those between junctions illustrated in **Figure 2-8**.

Area of Analysis	Severity			Total
	Slight	Serious	Fatal	
A40 Market Hall Vets (J6) to St Clears	31	15	3	***49***

Table 2-5 *Collision Data Summary (2011-2020)*

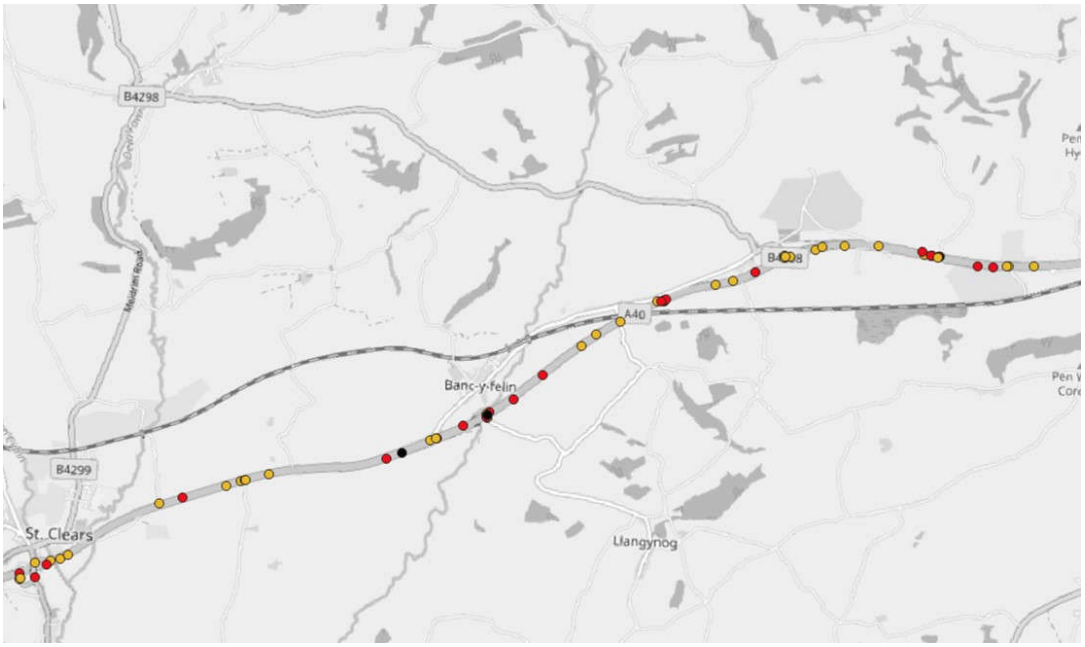


Figure 2-8 *Locations of all Collisions (2011-2020)*

There are a number of collision clusters within the scheme area, namely at the following locations:

- Ffoshelig Coaches / Agricultural Access (J11) to Tenby Road Filling Station (J12) – three slight, three serious and one fatal collision;
- Meidrim junction (J14) – four slight collisions;
- Private Access / Llangynog (J18) to Private Access (J21), including Bancyfelin (J19) – five slight, four serious, and two fatal collision; and
- High Street Slips (J40) – three slight and two serious collisions.

A summary of the collisions is provided as follows:

Fatal Collisions

Three fatal collisions have been recorded within the scheme area.

Of the fatal collisions it is not possible to ascertain the causation for the AC00416 fatal collision. This being said, the collision occurred at 2300 on a wet winter night and therefore the surrounding atmosphere could have played a role in causing the collision.

The second fatal collision (A002018) can be attributed to driver error, mistaking the access to the Tenby Road Filling Station (J12) as the Ffoshelig Coaches / Agricultural Access (J11) junction.

Following this fatal collision, temporary signage has been installed on the A40 westbound to ensure drivers understand that no access can be obtained to the Tenby Road Filling Station (J12) from the westbound carriageway. The temporary signage on the A40 westbound in the vicinity of the Ffoshelig Coaches / Agricultural Access (J11) junction is shown in **Figure 2-9**.

Figure 2-9 *Temporary Signage – A40 Westbound*

The third fatal collision (AF00820) occurred since the completion of the Stage One report and involved a pedestrian and a vehicle. Contributory factors include alcohol impairment and the pedestrian wearing dark clothing at night. It is noted that there is no existing crossing in this location, although an existing PRoW runs to the northern extent of the junction. No further detail is provided at the time of writing.

Serious and Slight Collisions

It is considered that a range of causation factors are applicable to the serious and slight collisions, with the following of particular note:

- Excessive speeds;
- Agricultural vehicles;
- Unsafe manoeuvres;
- Driver error; and
- Aggressive driver behaviour.

Although the serious and slight collisions are dispersed across the scheme, it is noted that there is a cluster of collisions located between the Ffoshelig Coaches / Agricultural Access (J11) and Tenby Road Filling Station (J12) junctions, as well as between the Private Access / Llangynog (J18) and Private Access (J21) junctions.

It is also noted that a significant number of serious and slight collisions occurred in the vicinity of the minor road junctions. It is therefore considered that the location of these minor road junctions could contribute to the number of collisions within the scheme area.

Collision Data (2020)

Within the above review consideration has been given to the collision data in 2020 to understand whether any additional safety risks have been identified and to understand the potential impacts of the COVID-19 pandemic.

A total of 10 collision were recorded within the scheme area in 2020, with six slight, three serious and one fatal collision recorded, as referenced above.

In terms of the serious collisions, it is noted that one collision (at the Carmarthen Showground (J10) junction) involved an on-road cyclist colliding with kerbing and falling onto a concrete area (A036020), with the other collisions involving vehicles along the route.

With the above analysis in mind, it is considered evident that there are notable collision clusters within the scheme area and therefore further consideration should be given to safety improvements along the route.

2.6.5. TPR4 – Inconsistent Slow-Moving Vehicles

It was identified during stakeholder engagement that Slow-moving vehicles within the scheme area are perceived as a safety concern and to potentially contribute to increased journey times during peak times.

Whilst there is no available data to evidence this issue, stakeholder feedback is considered an important element of this study and it is considered likely to be a contributory factor to the issues identified above. This being said, it is considered that the impact of slow-moving vehicles can be addressed as part of investigating solutions to other transport problems, such as TPR1, TPR2, TPR3, TPR10, and TPR11.

2.6.6. TPR5 – Sub-Standard Laybys

A total of 10 westbound and eight eastbound laybys have been identified as being located within the scheme area. The locations of the laybys within the scheme area are illustrated in **Figure 2-9**. It should be noted that bus laybys are considered as part of TPR8.

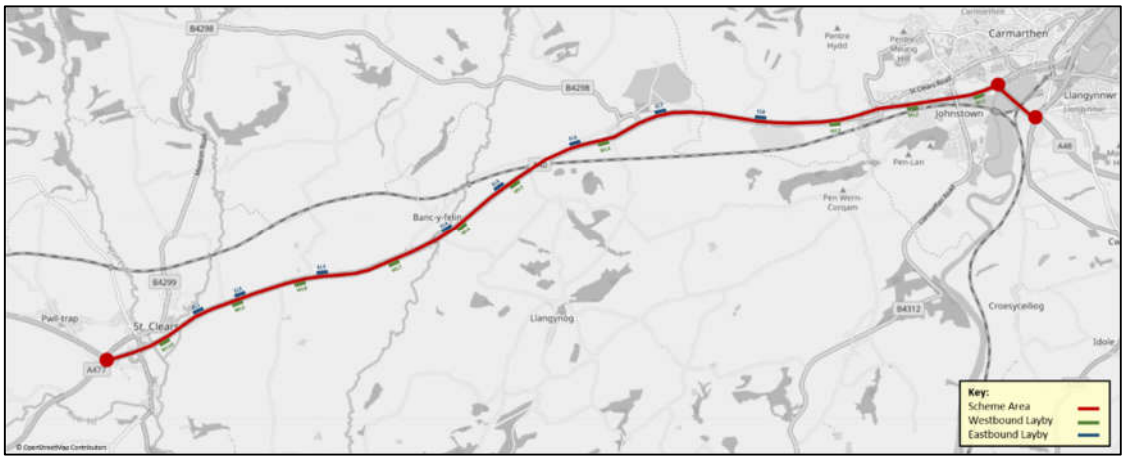


Figure 2-10 *Location of Laybys*

A review of the laybys within the scheme area was undertaken at WelTAG Stage One, with it identified that the vast majority of the facilities do not adhere to current standards for new laybys set out in DMRB CD 169[7], primarily due to the lack of a segregation island. It should be noted that further consideration to the layout of laybys has been undertaken as part of the development of options, as summarised in **Section 2.8.4**.

With this in mind, it is considered that improvements to layby provision could reduce the potential for collisions and have potential benefits to journey quality within the scheme area, and should therefore be further investigated.

2.6.7. TPR6 - Highway drainage and surfacing

Highway drainage has been identified within the stakeholder engagement undertaken at WelTAG Stage One as a transport problem along this section of the strategic road network. However, it is considered that this should be further investigated as part of the maintenance programme, and has therefore measures to address this transport problem have not been further investigated as part of this WelTAG study.

[7] Design Manual for Roads and Bridges (2019) *The design of laybys, maintenance hard standings, rest areas, service areas and observation platforms*. Available online: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol6/section3/CD%20169%20The%20design%20of%20lay-bys%20-web.pdf

2.6.8. TPR7 – Limited Active Travel Linkages

Existing Infrastructure Provision

The active travel infrastructure located adjacent to the A40 within the WelTAG Stage One scheme area is shown in **Figure 2-11**.

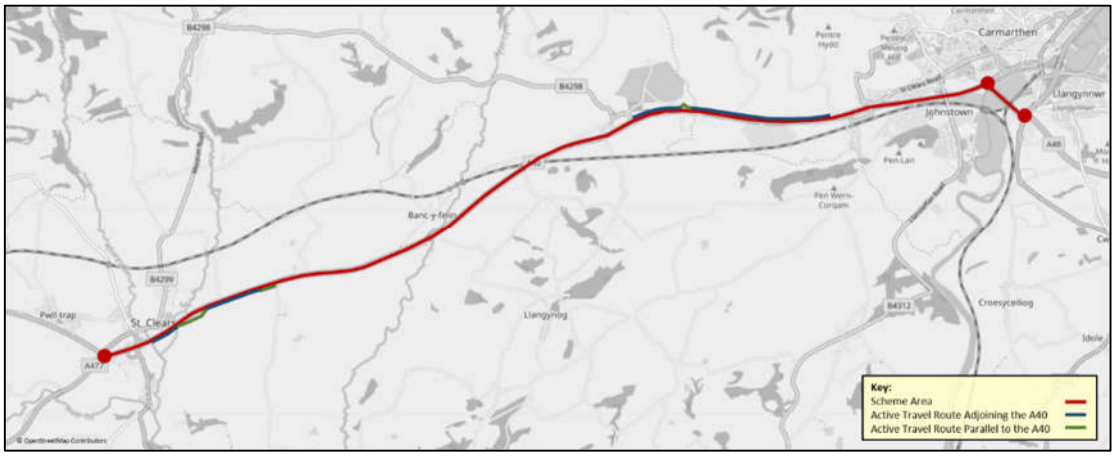


Figure 2-11 *Existing Active Travel Infrastructure Provision*

Within the scheme area, there are two active travel routes that adjoin or travel parallel to the A40. The eastern route is a shared-use path (SUP) that adjoins the northern side of the A40 linking between the residential dwellings just west of the Travellers Rest (J5) junction and the Meidrim (J14) junction.

The western route is a dedicated cycleway that adjoins the southern side of the A40 and forms part of Route 4 of the National Cycle Network (NCN4). The cycleway runs from the Private Access / Eglwys Llanfihangel Abercowin (J28) junction to in the vicinity of the High Street Slips (J40).

It is considered that the current provision is principally utilised for leisure journeys, although it is acknowledged that development of the routes and linkages between them could encourage some users to undertaken utility journeys[8] by pedal cycle.

[8] Leisure journeys relate to ad-hoc journeys made by active travel modes for the enjoyment, whereas utility journeys relate to journeys made for the purpose of getting to a destination, such as work.

In addition to the SUP and cycleway recorded within the scheme area, the following dedicated active travel provision has been identified as intersecting the WelTAG Stage One scheme area:

1. Grade-separated (underpass) crossing provision on the A48 arm of the Pensarn Roundabout (J1), which is part of NCN Route 4;
2. Pedestrian footpaths either side of the River Towy, that intersect the scheme area via grade separated underpasses at Pont Lesneven;
3. Uncontrolled crossing provision on the minor Tesco Delivery arm of the Pont Lesneven Roundabout (J2), between a local footway;
4. The NCN also intersects the scheme area at the Johnstown Slips (J4) overbridge;
5. SUP provided along the Travellers Rest (J5) overbridge; and
6. At-grade uncontrolled active travel crossing provision, that links to NCN Route 4, in the vicinity of the Pentre Road Slip (J37).

It should be noted that the provision outlined in points one to four are located to the east of this WelTAG Stage Two scheme area and have therefore not been further considered as part of this study.

Active Travel (Wales) Act

The Active Travel (Wales) Act places a legal requirement on Local Authorities to map, plan, improve and promote active travel routes. The requirements include production of an Existing Route Map (ERM), detailing all existing walking and cycling routes that have undergone an audit and meet the required active travel guidance, and an INM, which sets out CCC's 15-year vision for improving walking and cycling routes across the Authority.

A review of the ERM has identified that there is a reasonable provision for active travel users within the scheme area, considering the nature of the scheme area as a strategic dual carriageway road. This being said, it is acknowledged that the ERM does not identify any active travel routes within the central area of the scheme area, away from the built-up areas of Carmarthen or St Clears.

The CCC INM active travel designations of direct relevance to the scheme area are summarised in **Table 2-2**.

Area	Ref.	Location	Term	Type	Detail
Carmarthen	C14	Pont Lesneven (J1-J2) underbridge	Short-Term	Pedestrian / Cycle	SUP link to the existing cycle network.
	C9	Johnstown Slips (J4) overbridge	Short-Term	Cycle	Existing on-road cycling provision requires surface upgrade.
	C12	South of Johnstown Slips (J4) overbridge	Medium-Term	Pedestrian / Cycle	Improved SUP link to the educational facilities to the south of the Johnstown Slips (J4).
	C2	Travellers Rest (J5) junction	Medium-Term	Cycle	On-road cycle provision requires upgrading to provide cycle infrastructure separated from vehicle traffic.
	C1	West of Travellers Rest (J5) junction	Short-Term	Cycle	As the cycle track alongside the A40 failed the ERM assessment, it requires upgrading including maintaining foliage.
Bancyfelin (non-built-up area)	SC7	Meidrim (J14) junction to Bancyfelin (J19) junction, away from the A40	Aspirational	Cycle	Aspirational cycleway through Bancyfelin to link to SC4 / SC5 and east towards Carmarthen.
Llangynog (non-built-up area)	SC6	Sarnau overbridge (in the vicinity of the railway overbridge) to Private Access / Llangynog (J18) junction, away from the A40	Aspirational	Cycle	Aspirational cycleway through Llangynog to link to SC4 / SC5 and east towards Carmarthen.
St Clears	SC5	Private Access / Llangynog (J18) junction to Private Access / Eglwys Llanfihangel Abercowin (J28) junction	Aspirational	Cycle	Aspirational cycleway to link to SC4 and east to Carmarthen, details for the scheme to be agreed with Welsh Government.
	SC4	Private Access / Eglwys Llanfihangel Abercowin (J28) junction to High Street Slips (J40)	Short-Term	Cycle	Existing cycleway to be improved, subject to agreement with Welsh Government.
	SC2	East of High Street Slips (J40) – Afon Cynin underbridge	Short-Term	Cycle	Existing cycleway to be improved, subject to agreement with Welsh Government.

***Table 2-6** INM Active Travel Routes*

It is understood from a combination of the CCC INM and further engagement with CCC that there is an aspiration from the Local Authority to develop a continuous cycleway between Carmarthen and St Clears, making part-utilisation of the existing cycleway provision adjacent to the A40.

It should also be noted that INM routes C14, C9, and C12 are located to the east of the WelTAG Stage Two scheme area and have therefore not been considered further as part of this study. It is intended that these routes will be considered in further as part of the A40 Carmarthen Gateway WelTAG Stage Two study, which will consider improvements to the A40 to the east of the Travellers Rest (J5) junction.

Public Rights of Way

In addition to the existing provision of active travel routes, there are two occurrences where public PRoW intersect the scheme area. The crossing provision at both PRoW summarised as follows:

1. On the northern arm of the Private Access / Llangynog (J18) junction, with no crossing provision linking across the A40; and
2. Intersecting the A40 in the vicinity of the Pentre Road Slip (J37) via an uncontrolled crossing provision.

It should be noted that a combination of stakeholder feedback at WelTAG Stage One and anecdotal evidence from site visits suggests that the second PRoW is currently utilised by pedestrians.

Although no surveys have been undertaken, due to the rural nature of the corridor, it would be expected that the crossings primarily serve leisure journeys, although it is noted that the second PRoW could serve some utility active travel journeys to the sites accessed adjacent to the Coast-to-Coast Caravans junction (J36).

It is noted that Table 12.1 within the Active Travel Act Guidance[9], presented in **Figure 2-12**, for reference, indicates that at-grade crossings are suitable for few people, in relation to roads with a speed limit greater than 60mph. Due to the traffic demand along this route, Table 12.1 also suggests that uncontrolled at-grade crossings are suitable for few people at all speed limits and therefore it is considered that the suitability of the existing crossing provision should be reviewed.

[9] Welsh Government (2021) *Active Travel Act Guidance*. Available online: https://gov.wales/active-travel-act-guidance

Table 12.1 – Suitable crossings for speed/vehicle flows

Speed Limit	Total traffic flow to be crossed (AADT)	Maximum number of lanes to be crossed in one movement	Uncontrolled	Pedestrian Entry Treatment or Cycle Priority	Zebra or Parallel	Signal Control	Grade separated
≥ 60mph	Any	Any					
40 mph and 50 mph	> 10000	Any					
	6000 to 10000	2 or more					
	0-6000	2					
	0-10000	1					
≤ 30mph	> 8000	> 2					
	> 8000	2					
	4000-8000	2					
	0-4000	2					
	0-4000	1					

Provision suitable for most people.

Provision not suitable for all people and will exclude some potential users and/ or have safety concerns.

Provision suitable for few people and will exclude most potential users and/or have safety concerns.

Notes:
1. Table suggests appropriate treatments for a stand-alone crossing of a two-way carriageway. It is a guide only, and individual locations should be assessed on a case by case basis.
2. If the actual 85th percentile speed is more than 10% above the speed limit the next highest speed limit should be applied.
3. The recommended provison assumes that the peak hour motor traffic flow is no more than 10% of the 24 hour flow.

Figure 2-12 *Active Travel Act Guidance on Suitability of Crossings by Road Type*

2.6.9. TPR8 – Limited Safe and Convenient Bus Infrastructure and Services

There are eight designated bus stops that have been located within the scheme area, with six westbound bus stops and two eastbound bus stops. The locations of the bus stops are illustrated in **Figure 2-13**.

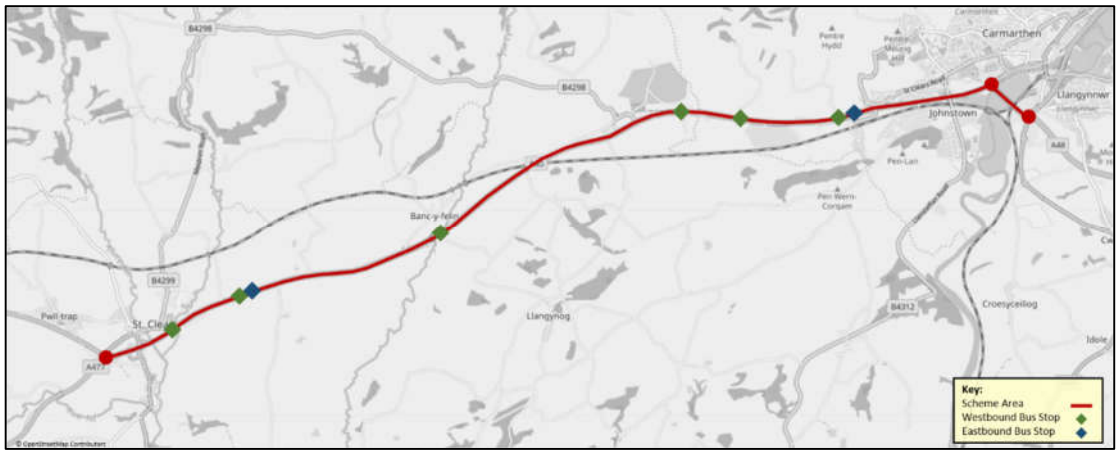


Figure 2-13 *Locations of Bus Stops*

Bus Services

The highest frequency of bus services within the WelTAG Stage One scheme area is to the east of the Travellers Rest (J5) junction. This is due to this area of the scheme area being located adjacent to Carmarthen town centre, linking to the east and areas to the west of the town. It is however noted that this is located to the east of the scheme area considered as part of this study.

To the west of the Travellers Rest (J5) junction, with this WelTAG Stage Two scheme area, the frequency of bus services significantly reduces, with a total of 15 services recorded in each direction every day. Due to the lack of bus services, it is considered that public transport is not currently a realistic mode of travel for residents living in the rural areas to the west of the scheme area; although it is acknowledged that the frequency of bus services in rural areas are typically lower than more urban areas such as Carmarthen.

Of the services to the west of the Travellers Rest (J5) junction, it is understood from stakeholder engagement that the westbound 222 service previously accessed the villages of Sarnau and Bancyfelin before re-joining the A40; however, following safety concerns identified by the bus operators, relating to visibility while making the right-turn movement from the Bancyfelin junction(J19), the westbound service has ceased to operate through Bancyfelin and Sarnau. There is therefore considered to be constraints within the scheme area that act as barriers to bus services operating within the adjoining rural settlements of Bancyfelin and Sarnau.

Bus Laybys

Within the scheme area, a total of three (two westbound and one eastbound) bus stops include the provision of dedicated bus laybys. A review of the bus laybys within the scheme area, in the context of current standards set out win CD 169, is provided in **Table 2-7**, with the locations of the bus laybys illustrated in **Figure 2-14**.

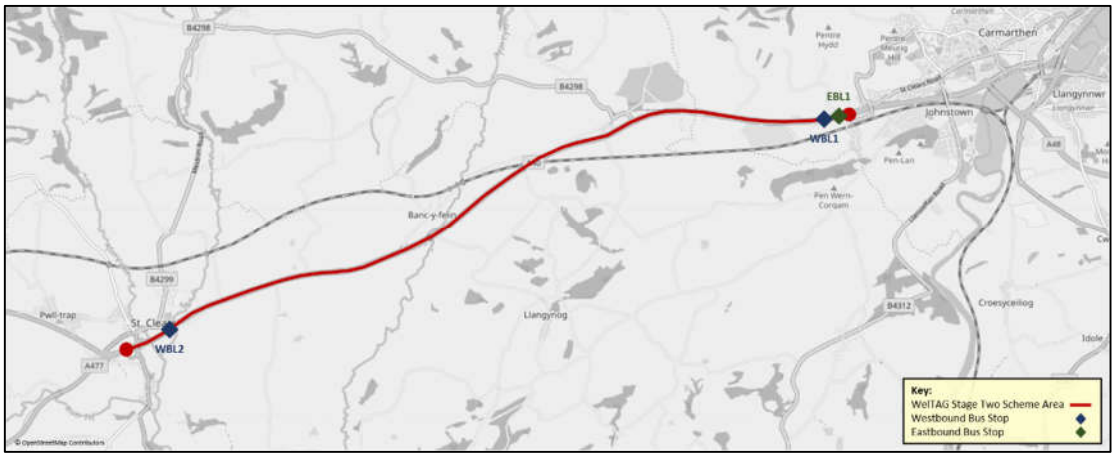


Figure 2-14 *Locations of Bus Laybys*

In addition to the above, two bus stops (one westbound and one eastbound) are located in parking laybys within the scheme area. There is currently no signage or road markings to identify the locations of the bus stops within the parking laybys, although it is noted that online journey planning resources designate both as bus stops. It should be noted that there is no reference in CD 169 to providing bus stops within parking laybys; however, as the bus stops are located in laybys WL9 and EL2, which are both Type B laybys that are not appropriate for this road type, it is considered that the provision of the bus stops in these locations present a safety concern.

The remaining bus stops (three westbound) are located adjacent to the A40, without any parking or bus layby. It should however be noted that there is currently no signage or road markings to identify the locations of the remaining bus stops, although it is noted that online journey planning resources designate both bus stops. It is considered that these three bus stops are currently unsuitable for the scheme area, posing a safety concern if buses were to stop in these locations.

Layby	Stopping Area Width			Merge Taper Length			Diverge Taper Length		
	Recorded Width	Standard	Compliance	Recorded Length	Standard	Compliance	Recorded Length	Standard	Compliance
Eastbound									
EBL1		3.5m	✓		25.0m	✓		45.0m	×
Westbound									
WBL1		3.5m	×		25.0m	✓		45.0m	✓
WBL2	6.3m	3.5m	✓	17.7m	25.0m	×	32.4m	45.0m	×

Table 2-7 *Existing Bus Layby Provision – CD 169*

2.6.10. TPR9 – Peak Period Delay to the East of the Johnstown Slips

This transport problem refers to peak period delay to the east of the scheme area considered as part of this study. This will be considered further as part of a separate WelTAG Stage Two study; no further consideration has been given to this transport problem as part of this study.

2.6.11. TPR10 – Seasonal Traffic

It was suggested by stakeholders at WelTAG Stage One that increases in traffic demand during the peak summer season contributes to increased journey time delay. This was informed by a review of Traffic Wales data at Stage One, with further analysis utilising the INRIX database undertaken as part of this WelTAG Stage Two study.

Traffic Wales

The following information has been extrapolated from the Traffic Wales data, noting only westbound data was available:

- **Daily Traffic** – the daily traffic flow by the month of the year; and
- **Diurnal Traffic Profile** – the diurnal traffic profile in the winter months (October 1st – March 31st) compared with the summer months (April 1st – September 30th).

Daily Traffic

The Traffic Wales daily traffic by month data is illustrated in **Figure 2-15**.

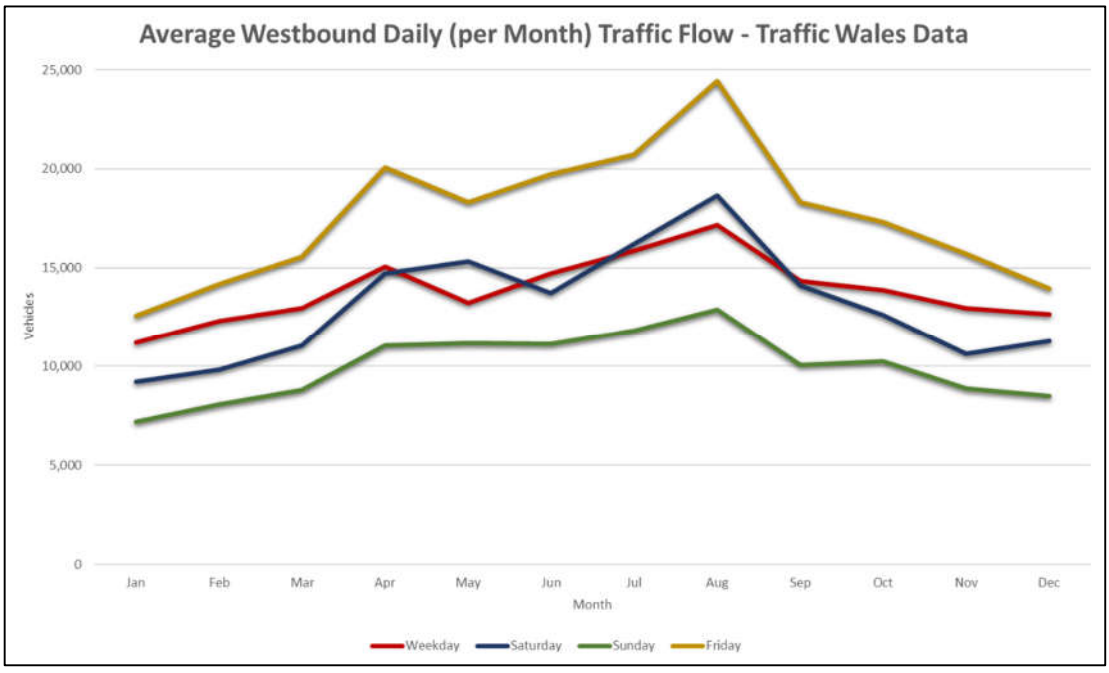


Figure 2-15 *Traffic Wales – Daily Traffic by Month*

According to the Traffic Wales data, the daily traffic demand is typically higher within the scheme area in the summer months (April – September) than the winter months (October – March). For all scenarios, the highest average daily traffic demand was recorded in the peak tourist summer month of August, suggesting that tourist traffic impacts on traffic demand within the scheme area.

Diurnal Traffic Profile

The average diurnal traffic profiles calculated from the Traffic Wales data are illustrated in **Figure 2-16**.

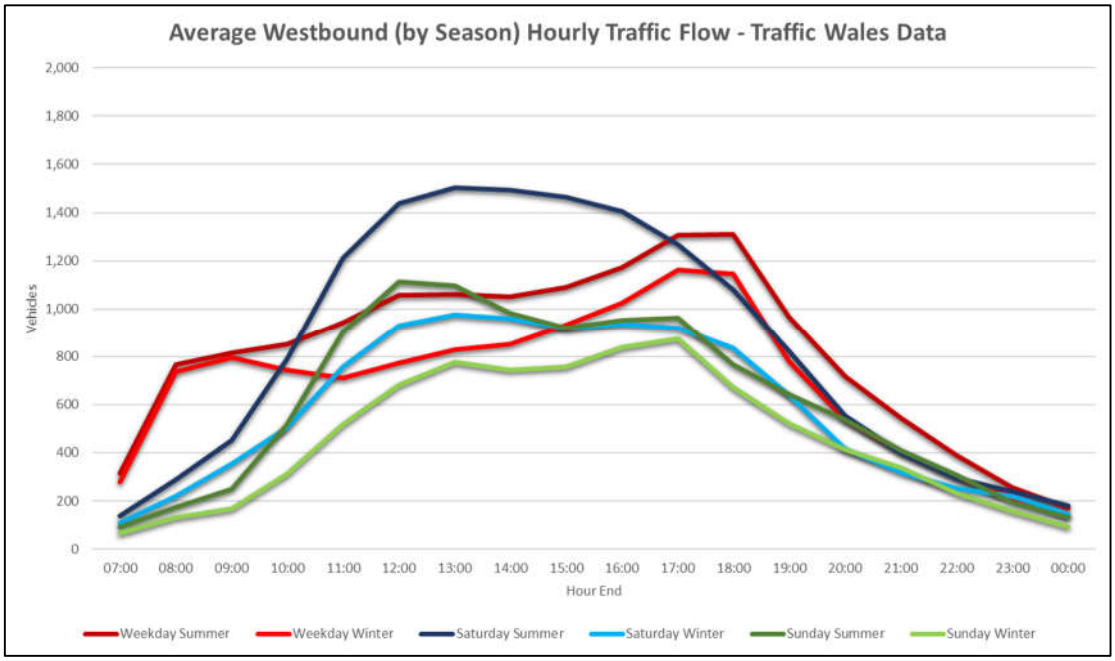


Figure 2-16 *Traffic Wales – Diurnal Traffic Profiles*

The traffic demand across the day is higher every hour in the summer months compared to the winter months, demonstrating the impact of tourist traffic on demand within the scheme area. It is also noted that the increase in traffic demand during the summer months is notable on Saturdays and Sundays. Of particular note, the traffic demand on Saturdays during the summer months is considerably larger than during the winter months, with the average traffic demand per hour larger than the summer weekday peak hour of demand between 1100 and 1600.

It is therefore considered that tourist traffic has a significant impact on traffic demand within the scheme area.

INRIX

Welsh Government has provided access to the INRIX Roadway Analytics tool, which is a database that utilises anonymous data from connected vehicles to provide traffic data, analytics, and visualisations for key roads and corridors. Speeds and journey times within the scheme area have been assessed in order to identify whether there are any prominent areas of congestion.

INRIX data has been interrogated to better understand the traffic flow patterns and trends along the A40 between Carmarthen and St Clears, noting it is possible to interrogate the date by time, day, month and year.

To support interpretation of the results, the study area has been divided into separate sections / links (east to west) with speeds analysed both eastbound and westbound:

- L1 Travellers Rest to Meidrim;
- L2 Meidrim to Bancyfelin;
- L3 Bancyfelin to Pentre; and
- L4 Pentre to High Street Slips.

Figure 2-17 compares the average speed over three years (2016-2019) (in blue) with speeds during the summer peak from 1st of July to the 1st of September 2019 (in orange) for each of the links. The data indicated that average speeds are lower by approximately 20kph between 10:00 – 14:00 from Meidrim to Travellers Rest (L1) on the eastbound carriageway during the summer period, and there is also a more pronounced variability in journey time, indicated by the larger shading of orange..

It is considered that this could be attributed to increased holiday traffic resulting in congestion the approach to Pont Lesneven Roundabout in Carmarthen. It is also considered notable that there is no other notable reduction in average speeds or increase in variability across the rest of the corridor, and therefore the impact of seasonal traffic appears to be concentrated on the Carmarthen Gateway area. It is important to note that this is outside of the study area considered in this report and is subject to a separate WelTAG study. More detailed images of the graphs summarised in **Figure 2-17** for each link can be found in the IAR.

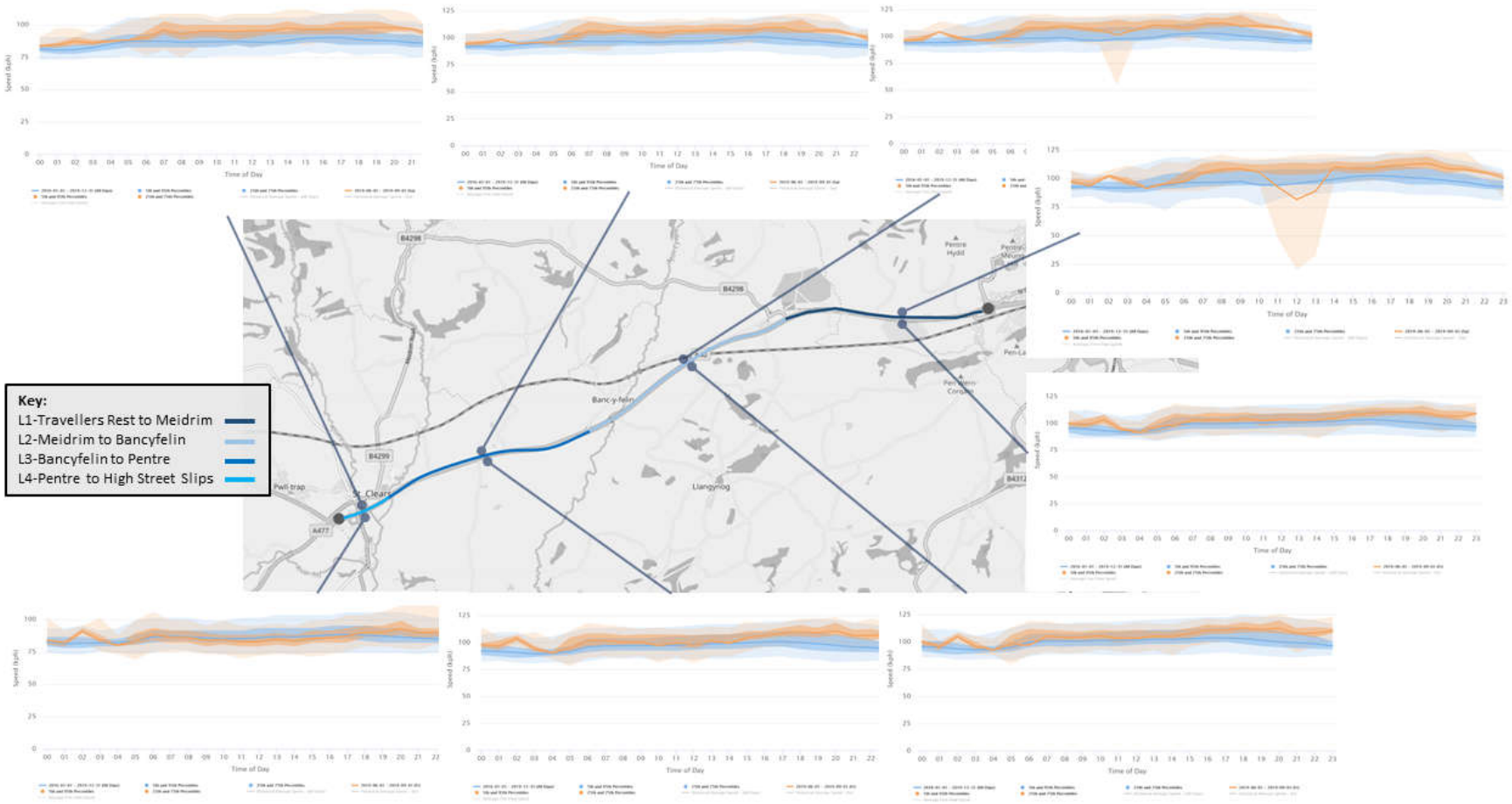


Figure 2-17 *Typical traffic speed, compared to summer peak using Inrix.*

2.6.12. TPR11 – Poor Scheme Area Resilience

Due to the rural location of the scheme area, between the settlements of Carmarthen and St Clears, combined with significant topographical challenges to the north and south, there is a limited number of alternative routes should a collision or congestion occur within the scheme area. On this basis, it is considered that the scheme area is not resilient to change.

In the occurrence that a collision occurs within the scheme area, SWTRA have designated diversion routes for traffic from the A40. The official routes follow the trunk road network which, in the case of the A40 from Carmarthen to St Clears, could result in a very circuitous diversion for all vehicles via Llandeilo, Llandovery, Builth Wells and Aberystwyth. At this point, Heavy Goods Vehicles (HGVs) follow a different path to all other vehicles due to an HGV size limit in Lower Town Fishguard; HGVs are diverted at Cardigan Roundabout to follow an official diversion route fully sign posted on the A478 county road, whereas all other vehicles continue using the trunk road onto Fishguard and Haverfordwest. There are also informal routes available that follow principal county roads, which may be suitable to accommodate diverted traffic on an ad hoc basis in the case of an emergency, however it is noted that these are not managed by SWTRA. It is also noted that there is a lack of an informal route between Carmarthen and Meidrim.

With this in mind, it is considered that the scheme area is currently not effective in dealing with incidents along the route and the lack of alternative routes ensures that any incidents along the route have a detrimental impact on the flow of traffic in the region.

2.6.13. TPR12 – Limited Access to Electric Vehicle Infrastructure

The Electric Vehicle Charging Strategy for Wales[10] has set out a vision that by 2025, all users of electric cars and vans in Wales will be confident that they can access electric vehicle charging infrastructure when and where they need it. As part of this, it is proposed that a rapid charging network is provided across the strategic road network, with charging points provided at a distance of approximately every 20 miles.

A review has identified that there are currently limited electric vehicle charging opportunities in the vicinity of the scheme area, with only the Tenby Road Filling Station providing electric vehicle charging points within the scheme area itself, although it is acknowledged there are additional charging points provided in Carmarthen and St Clears at either end of the scheme area.

It is set out within the Electric Vehicle Charging Strategic for Wales that TfW will take the lead in developing rapid charging on the strategic road network.

[10] Welsh Government (2021) *Electric Vehicle Charging Strategy for Wales*. Available online: https://gov.wales/electric-vehicle-charging-strategy-wales

With the above in mind, no further consideration has been given to the provision of electric vehicle provision within the scheme area as part of this study and workstream as this programme will be taken forward as part of other workstreams with ongoing dialogue feeding into future stages of this report.

2.6.14. Validation of Transport Problems

Based on the review above, several of the transport problems identified in the Stage One study are not considered appropriate for further consideration within this WelTAG Stage Two study. A summary of the relevance of each of the transport problems to this WelTAG Stage Two study is provided in **Table 2-8**.

Ref.	Transport Problem	Relevant to WelTAG Stage Two Scheme Area	Rationale
TPR1	Cross-carriageway manoeuvres at minor road junctions.	✓	A review of collision data has identified a number of collisions along this section associated with cross-carriageway manoeuvres and therefore options to address this transport problem have been further investigated as part of this study.
TPR2	Inadequate layout of minor road junctions.	✓	The number of direct private and agricultural accesses onto the A40 has been raised as a safety concern by stakeholders, and a review of the junctions has identified that the vast majority are sub-standard in the context of current standards.
TPR3	Notable collision clusters.	✓	There are a number of collision clusters located within the scheme area, and therefore improvements to safety have been further investigated as part of this study.
TPR4	Inconsistent slow-moving vehicles.	×	It is considered that measures that may alleviate this problem will likely be consistent with other transport problems and therefore addressing this issue specifically has not been further investigated.
TPR5	Sub-standard laybys.	✓	The majority of laybys within the WelTAG Stage Two scheme area are sub-standard, in the context of CD 169, and therefore the transport problem is relevant to this study.
TPR6	Highway drainage and surfacing.	×	Improvements to highway drainage and surfacing are considered to form part of ongoing maintenance therefore has not been considered further as part of this study.
TPR7	Limited active travel linkages.	✓	There is considered to be an opportunity to improve active travel routes within and adjoining the scheme area.
TPR8	Limited safe and convenient bus infrastructure and services.	✓	It has been identified that the existing bus stop provision for buses is inappropriate for this road type, whilst the layout of the Bancyfelin junction (J19) has been identified by the bus operators as a significant safety concern.
TPR9	Peak period delay to the east of the Johnstown Slips.	×	This transport problem is located outside of the scheme area and is therefore being addressed separately.
TPR10	Seasonal traffic.	✓	The Traffic Wales and INRIX data suggests that seasonal increases in traffic impacts on journey times towards the eastern extent of the corridor, which is outside of this WelTAG Stage Two. Therefore, no specific consideration has been given to this issue as part of this study. This being said, it is considered that any measures that improve safety within the scheme area will have a positive impact on the effects of seasonal traffic on communities surrounding the route
TPR11	Poor scheme area resilience.	✓	It has been identified that there are a lack of alternative routes surrounding the scheme area and therefore the route is not effective in dealing with incidents, which has a detrimental impact on the flow of traffic in the region.
TPR12	Limited access to electric vehicle infrastructure.	×	It is considered that this transport problem is being addressed a national level by TfW, on behalf of Welsh Government, and at a county level by CCC.

***Table 2-8** Transport Problems – Relevance to WelTAG Stage Two Scheme Area*

2.6.15. Impact of Transport Problems on Well-being

The Well-being of Future Generations (Wales) Act is considered a key legislation that needs to be explicitly considered during the WelTAG process. On this basis, consideration has been given to how the identified transport problems impact on the national and local well-being goals.

A summary of the impacts of the transport problems on the national and local well-being goals is provided in **Table 2-9**.

It is evident that the transport problems within the scheme area have a notable adverse impact on well-being. Of particular note, it is considered that the increased potential for collisions has a significant adverse impact on the prosperity of the area, in addition to increasing carbon emissions through increased journey times, in the occurrence of collisions along this section of the strategic highway network.

Well-being Goals		Transport Problems						
		TPR1	TPR2	TPR3	TPR5	TPR7	TPR8	TPR11
		Cross-carriageway manoeuvres at minor road junctions.	Inadequate layout of minor road junctions.	Notable collision clusters.	Sub-standard laybys.	Limited active travel linkages.	Limited safe and convenient bus infrastructure and services.	Poor scheme area resilience.
WBG1	A Prosperous Wales	-	-	-	-	0	-	-
WBG2	A Resilient Wales	-	-	-	-	0	-	-
WBG3	A Healthier Wales	-	-	-	-	-	-	0
WBG4	A More Equal Wales	0	0	0	0	-	-	0
WBG5	A Wales of Cohesive Communities	-	-	-	0	-	-	-
WBG6	A Wales of Vibrant Culture and Thriving Welsh Language	0	0	0	0	0	0	0
WBG7	A Globally Responsible Wales	-	-	-	-	-	-	-
LWBG1	Healthy Habits	0	0	0	0	-	-	0
LWBG2	Early Intervention	0	0	0	0	0	0	0
LWBG3	Strong Connections	-	-	-	0	-	-	-
LWBG4	Prosperous People and Places	-	-	-	-	0	-	-

Table 2-9 *Consideration of Transport Problems' Impacts on Well-being Goals*

2.6.16. Summary of Case for Change

It is considered that the review of the previous stage and an assessment of the problems in the context of the A40 scheme area for this specific WelTAG Stage Two has identified a case for change for further consideration in this location, specifically in the context of:

- Unsuitable junction layouts in the context of the high-speed nature of the road;
- Adverse impacts on well-being, primarily applicable to the potential for collisions;
- Sub-standard public transport infrastructure provision;
- Limited active travel provision; and
- Poor scheme area resilience and ability to accommodate seasonal traffic.

2.7. Transport Planning Objectives

The setting of TPOs, which are utilised in the assessment of identifying the preferred and most appropriate solution, is outlined as a key output of the strategic case within WelTAG. TPOs were identified as part of the WelTAG Stage One study for the A40 St Clears to Carmarthen scheme area and are outlined in **Table 2-10**.

Ref.	Transport Planning Objective	Rationale
TPO1	Improve safety for vehicle users, without having a significant adverse impact on the environment.	There appears to be an existing issue with road safety within the scheme area, supported by collision data and through feedback from stakeholders and observations during site visits. In addition to collision data, stakeholder feedback suggests that there is currently an issue with highway drainage and surfacing, that could potentially pose a safety risk. It is also considered that improving safety along the corridor will reduce the potential for incidents within the scheme area, improving the resilience of the corridor.
TPO2	Minimise the safety risk for active travel users within the scheme area.	It has been identified that the current active travel provision is limited and is not considered to be in line with the current Active Travel Act Guidance. In addition, it is considered that the presence of existing SUPs / cycleways attracts some active travel users (primarily leisure users at this stage) to utilise the route, which presents a safety concern, and therefore measures should be investigated to improve safety for pedestrians and cyclists along the route.
TPO3	Improve access by all transport modes, without having a significant adverse impact on the environment.	Whilst it has been noted that journey time delay within the scheme area is primarily associated with delay emanating from the large at-grade roundabouts at either end of the scheme area, it is considered that collisions have a detrimental impact and affect the accessibility of surrounding communities, particularly during the peak season. In addition, it is noted that access is currently limited by sustainable modes of travel such as walking, cycling and public transport, and therefore improvements to these could provide a benefit. It is also noted that the proposed development of the new West Wales Hospital and other strategic development aspirations could impact on traffic flows within the scheme area, and therefore future-proofing the resilience of the route is of utmost importance.
TPO4	Improve the operational efficiency of the strategic highway network, without having a significant adverse impact on the environment.	It is considered that there are areas of the scheme area that appear inefficient in terms of the operation, which may impact on safety and resilience. Therefore, it is considered appropriate to seek to improve the operational efficiency of the strategic highway network.
TPO5	Consider the future-proofing of the scheme area to enable delivery of emerging aspirational strategic and local schemes relating to public transport and electric vehicles.	There is an aspiration to develop the South-West Wales Metro, being driven by the four regional Local Authorities (including CCC), and it is considered important that any potential intervention allows for the future development of this strategic plan. In addition, it is understood that there is an emerging local and national Electric Vehicles Strategy, which any potential intervention should not act as a barrier to.

***Table 2-10** Transport Planning Objectives*

2.7.1. Verification of Transport Planning Objectives

The TPOs have been considered in the context of the identified transport problems, the well-being goals, and the priorities and well-being ambitions of the WTS, to identify where the TPOs cover the aspects identified; as shown in **Table 2-11**. It is considered that the TPOs area appropriate for this scheme area as they are shown to cover all transport problems, well-being goals, and the priorities and well-being ambitions of the WTS.

.

Criteria		Transport Planning Objectives				
		TPO1	TPO2	TPO3	TPO4	TPO5
		Improve safety for vehicle users, without having a significant adverse impact on the environment.	Minimise the safety risk for active travel users within the scheme area.	Improve access by all transport modes, without having a significant adverse impact on the environment.	Improve the operational efficiency of the strategic highway network, without having a significant adverse impact on the environment.	Consider the future-proofing of the scheme area to enable delivery of emerging aspirational strategic and local schemes relating to public transport and electric vehicles.
Transport Problems						
TPR1	Cross-carriageway manoeuvres at minor road junctions.	✓				
TPR2	Inadequate layout of minor road junctions.	✓	✓			
TPR3	Notable collision clusters.	✓				
TPR5	Sub-standard laybys.	✓				
TPR7	Limited active travel linkages.		✓	✓		
TPR8	Limited safe and convenient bus infrastructure and services.	✓	✓	✓		✓
TPR10	Seasonal traffic.	✓	✓	✓	✓	
TPR11	Poor scheme area resilience.	✓		✓	✓	✓
Well-being goals						
WBG1	A Prosperous Wales	✓		✓	✓	✓
WBG2	A Resilient Wales	✓				✓
WBG3	A Healthier Wales	✓	✓			✓
WBG4	A More Equal Wales		✓	✓	✓	✓
WBG5	A Wales of Cohesive Communities	✓	✓	✓	✓	✓
WBG6	A Wales of Vibrant Culture and Thriving Welsh Language					
WBG7	A Globally Responsible Wales	✓	✓	✓		✓
LWBG1	Healthy Habits		✓			✓
LWBG2	Early Intervention			✓	✓	✓
LWBG3	Strong Connections	✓	✓	✓	✓	✓
LWBG4	Prosperous People and Places	✓		✓	✓	✓
Wales Transport Strategy						
WTSP1	Bring services to people in order to reduce the need to travel.			✓		
WTSP2	Allow people and goods to move easily from door to door by accessible, sustainable and efficient transport services and infrastructure.		✓		✓	✓
WTSP3	Encourage people to make the change to more sustainable transport.		✓			✓
WBA1	Good for People and Communities.		✓			✓
WBA2	Good for the Environment.	✓	✓			✓
WBA3	Good for the Economy and Places in Wales.	✓		✓	✓	✓
WBA4	Good for Culture and the Welsh Language.					✓

Table 2-11 *Verification of Transport Planning Objectives*

2.8. Development of Options

2.8.1. Overview

This section provides a summary of the process of developing the short list of options for further consideration as part of this WelTAG Stage Two study.

A long list of options was derived at WelTAG Stage One following a review of the transport problems within the scheme area and completion of a GG142 Walking Cycling and Horse-Riding Assessment and Review (WCHAR)[11].

The long list options were subsequently assessed against the TPOs identified, which was considered to be an appropriate assessment framework at WelTAG Stage One in the context of the Well-being of Future Generations Act. This assessment enabled a number of options, such as major reallocation of road space and significant capacity enhancements, to be discounted at WelTAG Stage One.

A key output of the WelTAG Stage One was the identification of work packages which determined which short list options should be further investigated as part of this WelTAG Stage Two study, or as part of wider workstreams. The work packages identified at WelTAG Stage One that are separate to this study, are summarised as follows:

- WelTAG Stage Two studies specifically investigating improvements at Carmarthen Western Gateway, the Pensarn Roundabout and the St Clears Roundabout;
- Strategic review of active travel provision, which will assist in identifying significant gaps in active travel provision as well as identifying active travel routes that could support CCC's development of the INMs;
- Review of electric vehicles provision, which will form part of the work being undertaken by TfW as part of the roll-out of rapid charging on the strategic road network;
- Travel Demand Strategy for the region, which could be further developed as part of the Swansea Bay City Region;
- Lorry Parking Strategy, which could be combined with the Lorry Parking Strategy recommended for further consideration by the M4 J35 Pencoed to J49 Pont Abraham WelTAG Stage One study; and
- Rail Freight Strategy, which could be combined with the Rail Freight Strategy recommended for further consideration by the M4 J35 Pencoed to J49 Pont Abraham WelTAG Stage One study.

[11] Standards for Highways (2019) *GG 142 – Walking, cycling and horse-riding assessment and review*. Available online: https://www.standardsforhighways.co.uk/dmrb/search/5f33456d-32f9-4822-abf6-e12510f5c8dc

In addition to the above, following completion of the WelTAG Stage One study, the following interventions have been expedited and are being progressed as part of separate workstreams to this study:

- Ground investigation to inform options for the stabilisation of the slips in the vicinity of the Carmarthen Showground and Travellers Rest (Option VI19 of WelTAG Stage One);
- Design of a SUP between Bancyfelin and St Clears, which is included on the CCC INM. This formed part of Option AT4 and has therefore not been further investigated as part of this option within this study;
- Provision of parking restrictions at the layby adjacent to the Forge Filling Station, which was included as Option VI20 at WelTAG Stage One;
- Introduction of signage indicating no access to filling station in a westbound direction in advance of the Ffoshelig Coaches / Agricultural Access junction (J11), which was included as Option VI26 at WelTAG Stage One.

The agreed short list options for further consideration as part of this WelTAG Stage Two study are outlined in **Table 2-12**.

Ref.	Description
	Active Travel
AT1	Improvements to the existing SUP and cycleway within the scheme area.
AT2	Provision of an active travel route adjacent to the carriageway between the Meidrim and Bancyfelin junctions.
AT3	Improvements to the CCC ERM routes, where appropriate.
AT4	Development of the CCC INM routes.
AT5	Closure of PRoW crossing the A40 and identification of suitable alternative routes.
AT6	Improvements to the PRoW crossing the A40.
AT7	New crossing opportunities for pedestrians and cyclists within the scheme area.
AT8	Improvements to active travel linkages to the bus stops.
AT9	Removal of signage directing cyclists along the previous alignment of NCN4.
AT11	Introduction of a Traffic Regulation Order prohibiting the use of A40 by pedestrians.
AT12	Introduction of signage warning drivers of active travel users.
	Public Transport
PT3	Improvements to junction layouts to facilitate the safe movement of buses at the Meidrim and Bancyfelin junctions.
PT4	Bus vehicle actuated (VA) warning signs at the Meidrim and Bancyfelin junctions.
PT7	Improvements to the existing bus stop infrastructure provision.
	Vehicle Infrastructure
VI1	Introduction of targeted speed limit restrictions along the A40.
VI3	Introduction of speed enforcement cameras.
VI4	Re-configuration of cross-carriageway manoeuvre opportunities at minor road junctions.
VI5	Closure of minor road junctions.
VI6	Improved configuration of minor road junctions.
VI8	Closure of, or amendments to, the laybys within the scheme area.
VI20	Restrictions and rationalisation of parking opportunities for HGVs adjacent to the A40.
VI22	Road safety improvement measures at the High Street Slips.
VI26	Improved westbound signage in the vicinity of the Tenby Road Filling Station.
VI27	Introduction of improved, or new, agricultural vehicle warning signs.
VI29	Introduction of street lighting, where appropriate.
VI30	Improvements to alternative and diversion routes.
VI31	Introduction of a hard shoulder.
VI33	Introduction of noise mitigation and/or improvement measures.
	Highway Technology
SH1	Introduction of VA warning signs.
SH3	Introduction of variable information boards.
SH6	Introduction of autonomous vehicle infrastructure.

Table 2-12 *Short List Options for Consideration*

2.8.2. Active Travel

Overview

This Chapter describes the process undertaken to derive a list of interventions associated with the short list of options identified at WelTAG Stage One for active travel. The interventions developed have subsequently been utilised in the assessment of options to identify a preferred package of solutions within the scheme area.

The active travel options progressed to WelTAG Stage Three will be developed in line with relevant DMRB guidance, Active Travel Act Guidance, and following the principles set out within Procedure and Advice Guidance (PAG) 115/20: Active Travel and Trunk Road Improvement Schemes.

For reference, the short list active travel options are summarised as follows:

- **AT1 –** Improvements to the existing SUP and cycleway within the scheme area;
- **AT2 –** Provision of an active travel route adjacent to the carriageway between the Meidrim and Bancyfelin junctions;
- **AT3 –** Improvements to the CCC ERM routes, where appropriate;
- **AT4 –** Development of the CCC INM routes;
- **AT5 –** Closure of PRoW crossing the A40 and identification of suitable alternative routes;
- **AT6 –** Improvements to the PRoW crossing the A40;
- **AT7 –** New crossing opportunities for pedestrians and cyclists within the scheme area;
- **AT8 –** Improvements to active travel linkages to the bus stops;
- **AT9 –** Removal of signage directing cyclists along the previous alignment of NCN4;
- **AT11 –** Introduction of a Traffic Regulation Order prohibiting the use of A40 by pedestrians; and
- **AT12 –** Introduction of signage warning drivers of active travel users.

It should be noted that Option AT8 has been considered as part of Option PT7, as it relates to access to the bus stops within the scheme area.

Shared-Use Path and Cycleway Improvements (AT1)

It has been noted within the GG142 assessment that there may be an opportunity to improve the existing SUP which connects Meidrim to Carmarthen, running adjacent to the existing A40 carriageway.

Consideration has been given to Active Travel Act Design Guidance to review the suitability of the exsiting SUP provision, as shown in **Figure 2-18**.

Figure 2-18 *Existing A40 SUP and Table 11.1 of the Active Travel Act Design Guide*

The guidance suggests that the provision suitable for most people, with reference to the nature of the road, is a fully kerbed cycle track. A review of the existing route has found that whilst there are some sections where there is either VRS or narrow verge separating the SUP from the main carriageway, it is largely sub-standard along its length. With the alignment to the WTS and consideration of minimising the safety risk for active travel users within the scheme area in mind, it is suggested that this **AT1 should be taken forward for detailed consideration at WelTAG Stage Three**, with no further appraisal included as part of this WelTAG Stage Two study.

Meidrim to Bancyfelin Active Travel Route (AT2)

The review of the existing active travel provision within the scheme area has identified a potential gap in the committed provision along the A40, as shown in **Figure 2-19**.

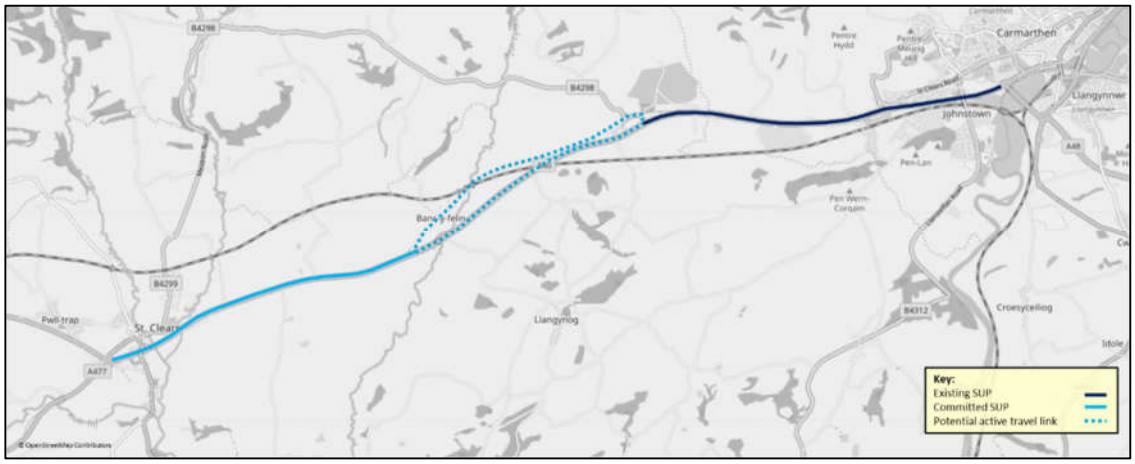


Figure 2-19 *Overview of Existing and Committed Active Travel Provision*

It is noted that this potential gap is identified on the CCC INM (ref: SC7). Due to this existing gap in the active travel network, consideration has been given to potential alignments to connect the committed SUP to the west of Bancyfelin with the existing SUP to the east of Meidrim, namely:

- Active travel link through Bancyfelin and along the parallel county road network; and
- Active travel link along the A40 between Bancyfelin and Meidrim.

An initial review of the potential routes has identified two significant constraints associated with A40 bridge structures over an unclassified road and the rail line along the A40 route, which would likely affect the deliverability of this potential alignment.

Whilst it is acknowledged that there are also constraints on the county route through Bancyfelin, such as a rail underbridge, it is considered that minor road narrowing could be implemented to facilitate a cycle route, which would also provide an element of traffic calming within the village setting. It is also pertinent to note the lower levels of traffic that would be routeing along the county route than the main A40, making the route more attractive to both leisure and potential active travel users. Therefore, it is considered that the active travel link through Bancyfelin should be **progressed as the AT2 option, for detailed consideration at WelTAG Stage Three**, with no further appraisal included as part of this WelTAG Stage Two study.

Improvements to Existing Route Map (AT3) / Development of Integrated Network Map (AT4)

It has been noted that there is an opportunity to improve the wider active travel network within the scheme area, with reference to the CCC ERM and INM. It is pertinent to note that the measures discussed within AT1 and AT2 are investigating measures to improve and develop the ERM and INM, respectively, within the context of the trunk road corridor. It has been identified that there are no other at-grade ERM or INM provision within the scheme area, and therefore further investigations as to the development of these wider routes has been recommended for progression as part of wider workstreams.

Therefore, **no further consideration of AT3 and AT4 for are included within this WelTAG Stage Two,** with the wider network being recommended under a separate works package.

Public Rights of Way and Crossing Opportunities (AT5, AT6 & AT7)

As referred to in Section 2.6.8 consideration has been given to the Active Travel Act guidance in determining the suitability of the existing crossing provision. The guidance suggests that at-grade crossings are suitable for few people, in relation to roads with a speed limit greater than 60mph.

With this in mind, a range of options have been considered at each of the PRoW, summarised as follows:

- Crossings are retained in their current form, with vegetation clearance being programmed into the regular SWTRA maintenance schedule;
- PRoW stopped up, extinguished, and re-routed as appropriate; and
- Crossing points are improved either at-grade or grade-separated.

With regards to the potential improvements reference has been made to the guidance provided in CD 377[12], which sets out the minimum requirements for vehicle restraint systems (VRS) for pedestrian facilities on a dual carriageway.

The standard detail for VRS' associated with pedestrian facilities on dual carriageways is presented in **Figure 2-20**.

[12] Standards for Highways (2021) *CD 377 – Requirements for Road Restraint Systems*. Available online: CD 169 - The design of lay-bys, maintenance hardstandings, rest areas, service areas and observation platforms - DMRB (standardsforhighways.co.uk)

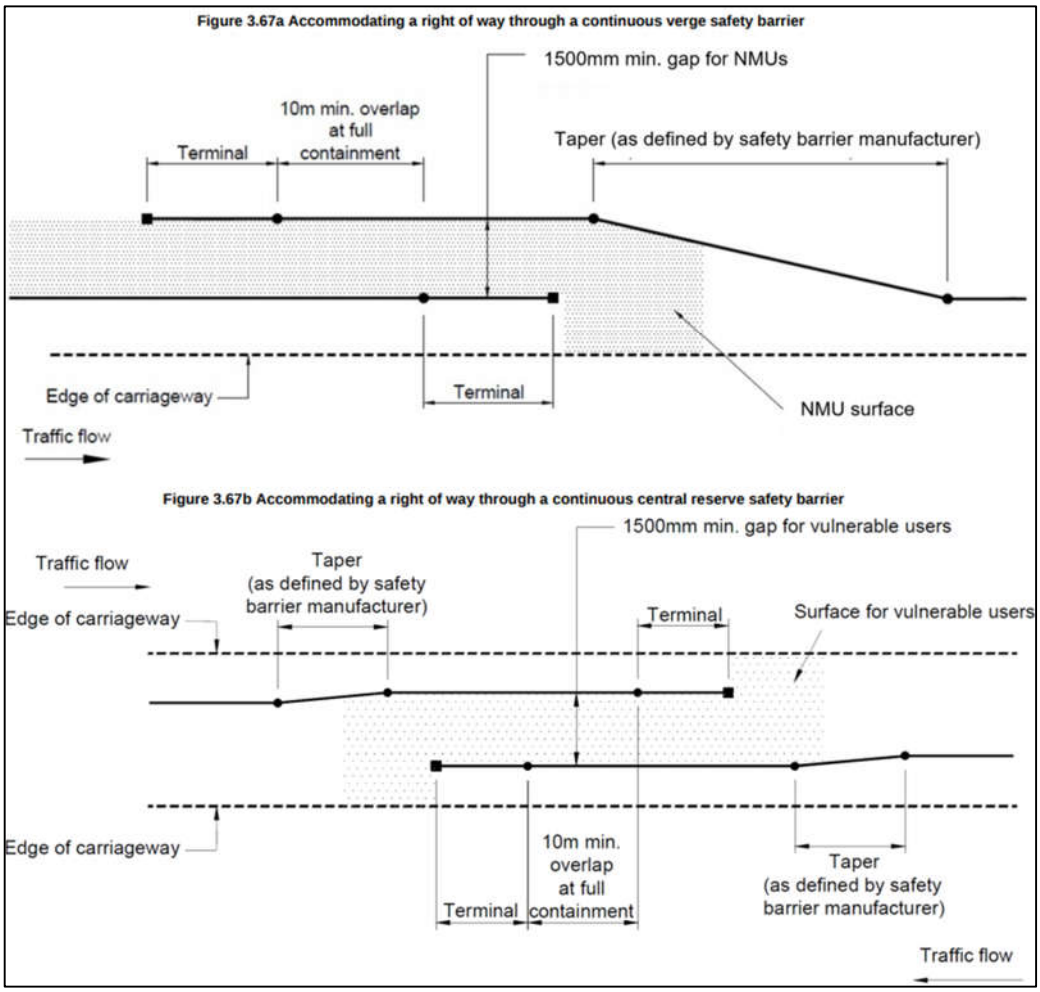


Figure 2-20 *Vehicle Restraint Systems – Pedestrian Facilities (CD 377)*

In order to further investigate the existing provision at the PRoW crossings, as summarised in **Table 2-13**, a review has been undertaken of the following:

- **Purpose –** summary as to whether there is a clear purpose for the route, such as connecting settlements to the north and south of the A40;
- **Adjoining Provision –** investigating whether there is any formal pedestrian provision adjoining the A40 providing onward connectivity;
- **Usage –** the anticipated usage of the route based mainly on visible condition;
- **Horizontal Visibility –** the level of horizontal visibility achievable from the crossing location based on satellite imagery;
- **Vertical Visibility –** the level of vertical visibility achievable from the crossing location based on engineering judgement and site observations;
- **Central Reservation Width –** the available existing width within the existing central reserve, compared with the standard of 4.41m set out in CD 377; and
- **Proximity to Alternative / Grade-Separated Crossing** – summary of whether there is a grade-separated crossing located within the vicinity of the PRoW, providing a safer alternative route.

Criteria	PRoW Ref	
	63/32	63/33
Purpose	Connects St Clears to individual properties to the south in addition to onwards leisure routes.	Potential connection as part of longer PRoW between small settlements
Adjoining Provision	Connects to highway link to the north in St Clears and established footpath to the south through rural villages	Connects to highway links through rural villages
Usage	Observed usage	Limited evidence of usage, with overgrown vegetation obstructing the style on the northern side of the carriageway
Horizontal Visibility	Reasonable visibility crossing north to south, but potential for south to north visibility being obscured in a west facing direction due to alignment of carriageway	Reasonable
Vertical Visibility	Reasonable	Reasonable
Central Res Width	Below recommended standard for at-grade crossing	N/A due to presence of vehicular junction
Proximity to Grade-Separated Crossing	Underpass provided approximately 350m west, though feedback on the CCC ATNM consultation indicates it is often closed.	No formal crossing in the vicinity

Table 2-13 *Review of PRoW crossing*

The review indicates that there is a need for the crossing points at, or close to, the existing locations. Whilst it is noted that no collisions have been recorded between vehicles and pedestrians within the scheme area, it is considered that improvements should be developed (i.e. retaining crossings in their current form has been omitted as an option at this stage).

It is noted that there could be an opportunity to create a grade-separated crossing point at PRoW 63/33, adjacent to where a fatal pedestrian collision occurred in 2020, by utilising an existing underpass connecting fields to the north and south of the A40, as shown in **Figure 2-21**.

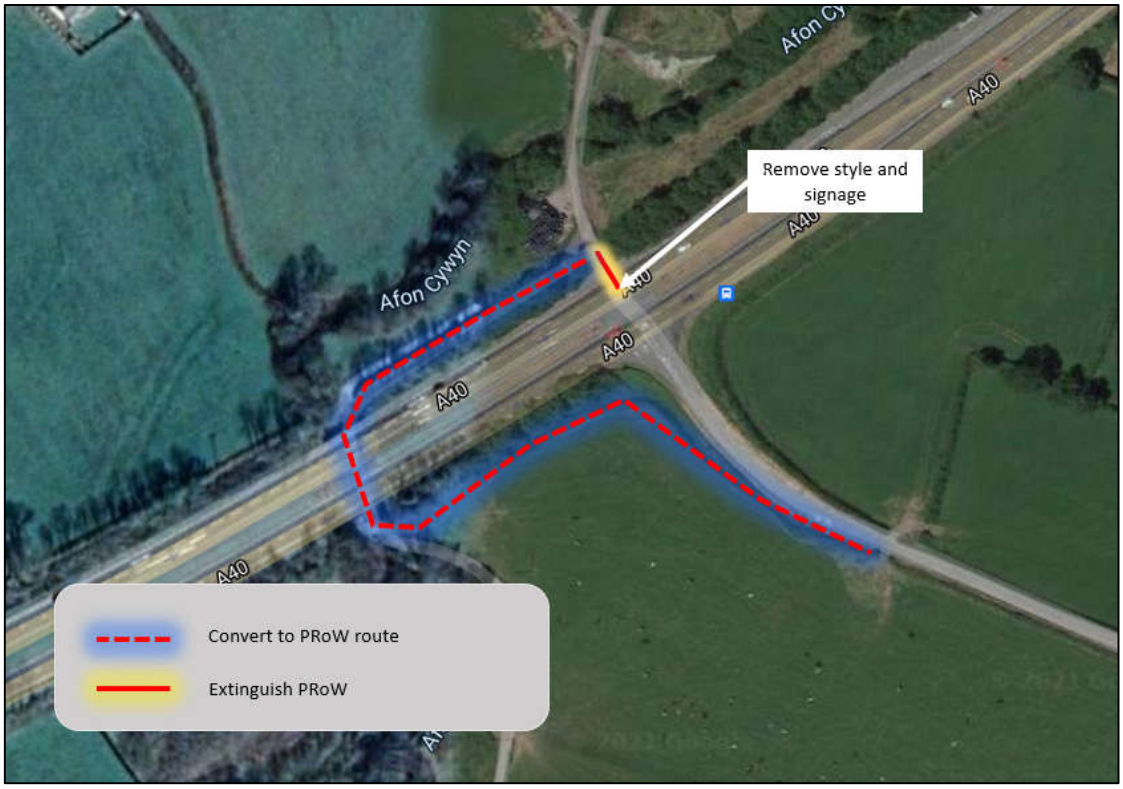


Figure 2-21 *Potential re-routing of PRoW 63/33*

Following consideration of the PRoW and any opportunities for new grade-separated crossing opportunities, the following options are considered suitable for further review:

- **AT5/6/7(a) –** stopping up, extinguishing, and re-routing one PRoW (63/33), and improvements to the existing crossing at PRoW 63/32, in line with the requirements set out in CD 377; and
- **AT5/6/7(b)** – stopping up, extinguishing, and re-routing one PRoW crossing (63/33), and provision of a grade-separated crossing at PRoW 63/32, in line with the requirements set out in CD 377.

Removal of Legacy Signage (AT9)

It has been suggested as part of stakeholder feedback that the active travel network would benefit from the removal of legacy signage directing cyclists along the route of the former alignment of the NCN4

It is considered that this is a minor intervention, which would be low cost, and low impact, and therefore no further analysis has been undertaken as part of this WelTAG Stage Two. **It is suggested that this should be included as a supplementary measure to any Stage Three that is progressed.**

Traffic Regulation Order (AT11)

It is considered that the vast majority of the A40 within the scheme area is considered unsuitable for pedestrian use, due to the rural dual carriageway nature of the route.

Further consideration has been given to introducing a traffic regulation order (TRO) restricting pedestrians from accessing the A40. The intention of a TRO in this location would be to:

- Avoid danger to people and prevent danger from arising; and
- Prevent use of the route by an unsuitable mode of travel for the road type.

The review of the scheme area and stakeholder feedback has not identified a notable demand for existing pedestrian movements along the A40, although it is acknowledged that there is an existing SUP located to the east of the Meidrim junction (J14) adjacent to the carriageway. On this basis, it is considered that the unsuitable nature of the A40 deters pedestrian movements along the route within the scheme area and therefore there is likely to be limited benefit in the introduction of a TRO. Therefore, it is **not considered necessary to further investigate the introduction of a TRO restricting pedestrians at this stage**.

It is however noted that if a need is identified as part of the monitoring plan post-implementation, or through comments raised by members of the public, the introduction of a TRO restricting pedestrians can be further investigated at a later date.

Pedestrian Warning Signage (AT12)

Chapter 4 of the Traffic Signs Manual[13] describes warning signs as ways to alert drivers to potential danger ahead, indicating a need for special caution by road users that may require a reduction in speed or some other manoeuvre (Section 1.6.2). It is considered that warning signs can play an important part in improving road safety; however, the Traffic Signs Manual describes that they should only be used where there is a specific safety issue or hazard.

It is also stated that in Section 16.1.4 of Chapter 4 of the Traffic Signs Manual describes that pedestrian warning signs may be used where pedestrians cross high-speed roads, in locations such as where roads intersect established pedestrian routes, sited at a distance appropriate to the 85th percentile speed. It is therefore considered that pedestrian warning signs **should be considered as a supplementary measure at WelTAG Stage Three** alongside the preferred solution package. No further appraisal of AT12 is therefore included within this specific WelTAG Stage Two.

2.8.3. Public Transport

Overview

This section describes the process undertaken to derive a list of interventions associated with the short list of options identified at WelTAG Stage One for public transport. The interventions developed have subsequently been utilised in the assessment of options to identify a preferred package of solutions within the scheme area, as detailed in **Chapter 3**.

[13] Traffic Signs Manual (2018) *Chapter 4 – Warning Signs*. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/772037/traffic-signs-manual-chapter-4.pdf

For reference, the public transport short list options are summarised as follows:

- **PT3 –** Improvements to junction layouts to facilitate the safe movement of buses at the Meidrim and Bancyfelin junctions;
- **PT4 –** Bus vehicle actuated (VA) warning signs at the Meidrim and Bancyfelin junctions; and
- **PT7–** Improvements to the existing bus stop infrastructure provision.

In addition to the above, it is noted that Option AT8 (Improvements to active travel linkages to the bus stops) refers to public transport related improvements and has subsequently been considered alongside Option PT7.

Improvements to Meidrim and Bancyfelin Junctions (PT3)

Due to the cross-carriageway manoeuvres undertaken by the bus services at the Meidrim junction (J14), it was considered that it may be appropriate to develop improvements at the junction to improve safety for bus movements. In addition, it is understood that a safety concern has stopped bus operators from utilising the Bancyfelin junction (J19).

It is considered however that the improvements to the junctions, in the form of improvements to current standards and restriction of cross-carriageway manoeuvres (VI4, VI5, and VI6) could result in benefits for bus services at these locations. With this in mind, it is considered that these options are likely to address the safety concerns for buses at the Meidrim (J14) and Bancyfelin (J19) junctions, and therefore specific bus safety improvements at the junctions have **not been further considered at this stage**.

Despite this, re-engagement with bus operators at WelTAG Stage Three will be undertaken to investigate whether any enhanced safety measures could be introduced at the junctions as part of the detailed design of the preferred VI4, VI5, and VI6 options. It should be noted that engagement was sought with the bus operators as part of this WelTAG Stage Two study, although no response was provided.

Bus Vehicle Actuated Signs (PT4)

Due to the cross-carriageway manoeuvres undertaken by the bus services at the Meidrim junction (J14), and previously at the Bancyfelin junction (J19), it was considered that it may be appropriate to introduce bus VA warning signs at both junctions to warn drivers of this potential hazard.

Further consideration of this measure has identified that this option could support implementation of an intervention at both junctions; however, further assessment is not required at this stage. On this basis, the introduction of bus VA warning signs at the Meidrim (J14) and Bancyfelin (J19) junctions will be **further considered at WelTAG Stage Three**, during the detailed design of the preferred VI4, VI5, and VI6 interventions at the junction.

Bus Stop Infrastructure and Active Travel Linkages (PT7 & AT8)

Review of Existing Provision

A review of the existing bus stop infrastructure has been undertaken in line with CD 169. A review of the geometries of the three bus laybys located within the scheme area (as illustrated in **Figure 2-14**), has identified that the existing provision does not comply with the standards for new bus laybys on all-purpose trunk roads.

An indicative diagram of a compliant bus layby, as set out within Figure 5.6N within CD 169, is illustrated in **Figure 2-22**.

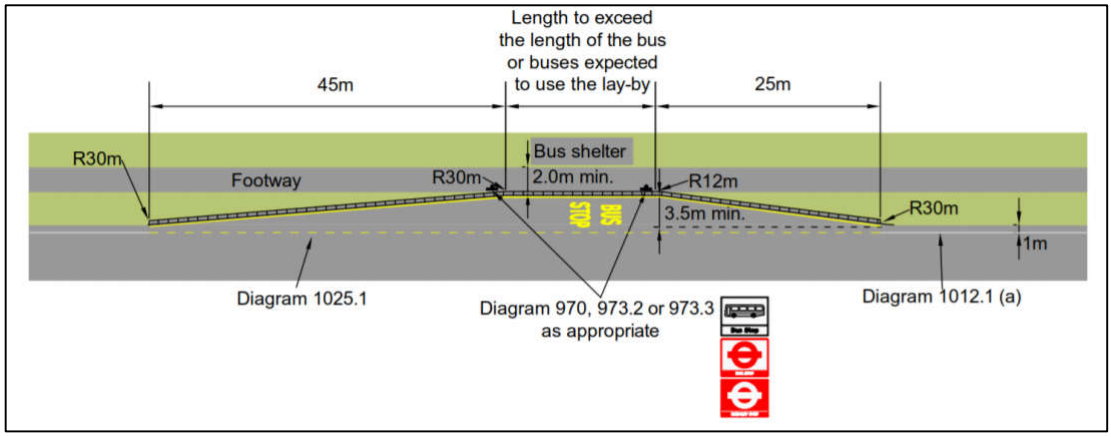


Figure 2-22 *Geometric Layout of Bus Layby*

Online journey planning tools also suggest that two bus stops are located within parking laybys along the A40, with three bus stops located adjacent to the route with no associated provision.

It is considered that all five stops referred to above are unsuitable, however further engagement will be undertaken at the next stage to understand the need for stops at these locations.

Consideration has also been given to improvements on the active travel linkages to and from the bus stops. It has been identified that the eastern bus laybys (EBL1 and WBL1) are currently linked by a pedestrian subway, which is accessed step-free by footways, whilst an uncontrolled at-grade pedestrian crossing provides access from St Clears to bus layby WBL2.

Potential Options

With the above in mind, potential improvements to the bus laybys have been developed for further assessment, summarised as follows:

- **Do Minimum (PT7DMin) –** improvements to the bus laybys, to upgrade the provision in line with CD 169;
- **Do Something (PT7DS) –** improvements to the bus laybys, to upgrade the provision in line with CD 169, as well as improvements to the existing active travel linkages to the bus stops; and
- **Do More (PT7DMo) –** improvements to the bus laybys, to upgrade provision in line with CD 169, as well as improvements to the existing active travel linkages at EBL1 and WBL1, and the provision of a new grade-separated crossing facility at WBL2.

2.8.4. Vehicle Infrastructure

Overview

This section describes the process undertaken to derive a list of interventions associated with the short list of options identified at WelTAG Stage One for vehicle infrastructure. The interventions developed have subsequently been utilised in the assessment of options to identify a preferred package of solutions within the scheme area, as detailed in **Chapter 3**.

For reference, the vehicle infrastructure short list options are summarised as follows:

- **VI1 –** Introduction of targeted speed limit restrictions along the A40;
- **VI3 –** Introduction of speed enforcement cameras;
- **VI4 –** Re-configuration of cross-carriageway manoeuvre opportunities at minor road junctions;
- **VI5 –** Closure of minor road junctions;
- **VI6 –** Improved configuration of minor road junctions;
- **VI8 –** Closure of, or amendments to, the laybys within the scheme area;
- **VI20 –** Restrictions and rationalisation of parking opportunities for HGVs adjacent to the A40;
- **VI22 –** Road safety improvement measures at the High Street Slips;
- **VI26 –** Improved westbound signage in the vicinity of the Tenby Road Filling Station;
- **VI27 –** Introduction of improved, or new, agricultural vehicle warning signs;
- **VI29 –** Introduction of street lighting, where appropriate;
- **VI30 –** Improvements to alternative and diversion routes;
- **VI31 –** Introduction of a hard shoulder; and
- **VI33 –** Introduction of noise mitigation and/or improvement measures.

Speed Limit Changes (VI1)

Stakeholder feedback undertaken at WelTAG Stage One highlighted that speeds are perceived to be high along this section of the A40, which presents potential safety concerns. On this basis, targeted changes to the speed limit have been further investigated as part of this WelTAG Stage Two study.

It is considered that changes to speed limits are principally associated with providing benefits related to congestion, safety and/or air quality / carbon emissions. With this in mind, the potential requirements for any changes in speed limits has been considered in the context of congestion, safety and air quality / carbon emissions.

Congestion

It is considered that reducing speed limits can assist in regulating traffic flow on congested areas of the highway network, improving throughput and journey time reliability.

The review of the scheme area undertaken at WelTAG Stage One identified that the majority of journey time delay and congestion occurs on the approaches to the Pont Lesneven Roundabout, which is located to the east of the scheme area, and the St Clears Roundabout (J41), with limited significant congestion recorded between these two junctions.

With this in mind, it is considered that site observation and INRIX data do not support the requirement for a reduction in speed limit to 50 mph for the purpose of congestion benefits along the route, and therefore **it is not considered that changes to speed limits are appropriate in the context of congestion**.

Safety

Welsh Government's 'Guidelines for the Submission of Road Safety Schemes'[14] document indicates that a reduction in speed limit could reduce collision rates by between 15% and 25% without any enforcement. It is therefore considered that through a reduction in the speed limit, it is considered that the likelihood of and severity of collisions could be reduced within the scheme area, particularly at the junctions.

The relevant guidance for setting speed limits on trunk and county roads in Wales is included within the 'Setting Local Speed Limits in Wales' document[15]. It is considered that the A40 within the scheme is a rural road and therefore Section 6 provides further detail as to the setting of speed limits for this road type. Section 6.10 states the following for the setting of speed limits on rural dual carriageway roads:

[14] Welsh Government (2011) *Guidelines for the submission of road safety schemes.* Available online: https://gov.wales/guidelines-submission-road-safety-schemes

[15] Welsh Government (2009) *Setting Local Speed Limits in Wales*. Available online: https://gosafe.org/media/21801/091105speedlimitguidelinesen.pdf

"Rural dual carriageways will generally be subject to the standard national speed limit, currently 70mph. However, a lower limit may be appropriate if a collision history or specific local circumstances indicate that this cannot be achieved safely. An example of local circumstances is where vulnerable road user activities occur and/or where a significant collision history exists which cannot be resolved by other engineering means".

For the majority of the scheme area, it is considered that other engineering means (VI4, VI5, and VI6) are being developed to address the primary safety concern associated with the junctions along this section of the A40. On this basis, it is considered that any changes in the speed limit for safety is unlikely necessary on safety grounds for the majority of the scheme area at this stage.

If the preferred VI4, VI5 and/or VI6 options are implemented, the collision rates along the route will be monitored and changes to the speed limit on safety grounds could be further considered if there is no reduction in collision rates recorded.

This being said, it is considered that a reduction in the speed limit westbound between the Pentre Road Slip (J37) and the St Clears Roundabout (J41) may be appropriate due to the more urban nature of this section of the corridor. It is noted that there are two serious collisions recorded on approach to the St Clears Roundabout (J41), as well as an additional slight collision and two slight collisions at the High Street Slips (J40) westbound off-slip. It is considered that a reduction in speed limit to 50 mph westbound between the Pentre Road Slip (J37) and St Clears Roundabout (J41) could be appropriate from a road safety perspective.

Air Quality / Carbon Emissions

The reduction of speed limits from 70 to 50 mph can reduce fuel consumption and pollutant emissions, minimising the impact of the transport network on climate change through a reduction in carbon emissions.

Although there are no air quality management areas (AQMAs) or concentrations of nitrogen dioxide (NO2) exceeding the limit set out in the Ambient Air Quality Directive within the scheme area, it is considered that a reduction in speed limit could reduce carbon emissions and improve air quality. It is considered that this could support the Net Zero carbon emissions commitment set out by Welsh Government, in addition to supporting the decarbonisation of the sector which is a key theme of the WTS.

Due to the limited construction works that would be required to facilitate a reduction in speed limit, it is therefore considered that a reduction in speed limits could provide a reduction in carbon emissions across the scheme area.

Potential Options

With this in mind, a reduction in speed limit from 70 to 50 mph has been further assessed for the following extents:

- **VI1a –** Full Route (Carmarthen to St Clears);
- **VI1b –** Travellers Rest (J5) to Meidrim (J14);
- **VI1c –** Meidrim (J14) to Bancyfelin (J19);
- **VI1d –** Bancyfelin (J19) to Pentre Road Slip (J37); and
- **VI1e –** Pentre Road Slip (J37) to St Clears Roundabout (J41).

Whilst it is acknowledged that a reduction in speed limit along the length of the scheme area was discounted at WelTAG Stage One, this potential option has been further investigated as part of Option VI1a. This is principally due to the increasing focus on carbon emissions and the requirement to reduce these across the transport network in order to decarbonise the sector, as set out within the WTS which has been published since completion of the WelTAG Stage One study.

Speed Enforcement (VI3)

It was suggested by stakeholders at WelTAG Stage One that speeding vehicles were considered an issue along this section of the A40. On this basis, it is considered that further investigation of potential speed enforcement should be undertaken as part of this WelTAG Stage Two study.

Welsh Government's guidance for speed enforcement sets out specific selection criteria for different types of speed camera enforcement sites on the network that have been applied following the National Safety Camera Programme. These criteria include:

- The length of route/site;
- The number of killed and serious injury collisions (KSI) on the route/site;
- The total personal injury collision scoring per kilometre (fatal or serious = 5, slight = 1);
- The 85th percentile speed limit at the proposed site; and
- That site conditions are suitable for the type of enforcement proposed.

These site selection criteria have been shown to reduce speeds and casualties at camera sites and provide a systematic approach to site selection. The selection criteria for fixed speed camera sites, mobile speed camera sites and routes (i.e. average speed cameras) are summarised in **Table 2-14**.

Criteria	Fixed Speed Camera Sites	Mobile Speed Camera Sites	Route - Average Speed Cameras
Route Length	Between 0.4km and 1.5km	Between 0.4km and 5km	Between 5km and 20km
KSI	At least three KSI collisions per km in the baseline period[16]	At least one KSI collisions per km in the baseline period	A minimum of three existing core sites within the length (there are no further requirements) OR Has at least one KSI collision per km (average) in the baseline period and meets the PIC total value below.
Collisions[17]	18/km	9/km	6/km
85th Percentile Speeds	Speed survey shows free-flow 85th percentile speed is at or above or above the Association of Chief Police Officers (ACPO) enforcement threshold in built-up areas[18] and 5 mph over maximum speed limit in non-built up areas [19]. This can apply to all vehicles or a vehicle class but must be compared consistently.		
Site Conditions	Loading and unloading of the camera can take place safely	Location for mobile enforcement is easily accessible and there is space for enforcement to take place in a visible, legal and safe manner.	The location of the collisions in the baseline period will determine the length of route.
Suitability of Site	The Highway Authority must undertake a site survey, demonstrating the following: (a) The speed limit has been reviewed confirming that camera enforcement is the right solution; (b) There is no other cost effective engineering solution that is more appropriate; (c) That the Traffic Regulation Order (where applicable) and signing are lawful and correct.		

***Table 2-14** Speed Enforcement Site Selection Criteria Parameters – Welsh Government*

[16] The baseline period is the most recent 36-month period available when proposal is submitted, where the end date is within 12 months of the date of submission.

[17] New camera sites will be selected using an assessment that includes the level of fatal, serious and slight collisions. The combined level of collisions will be expressed as a numerical scale (see below) and assessed relative to the road classification for the site - whether it is either a 'built up' or 'non-built up' area and according to the type of site i.e. route, fixed, mobile or red light. Fatal or serious injury collision = 5 (i.e. 2 serious collisions = 10) Slight injury collision = 1 (i.e. 5 slight collisions = 5).

[18] 'Built up area' is defined as a road with a speed limit of 40 mph or less. 'Non-built up area' is defined as a road with a speed limit of 50 mph or more.

[19] 'Built up area' is defined as a road with a speed limit of 40 mph or less. 'Non-built up area' is defined as a road with a speed limit of 50 mph or more.

As part of the assessment for the suitability of speed enforcement within the scheme area, the following sections have been considered for speed camera enforcement:

- Full Route (Travellers Rest to St Clears);
- Travellers Rest (J5) to Meidrim (J14);
- Meidrim (J14) to Bancyfelin (J19);
- Bancyfelin (J19) to Pentre Road Slip (J37); and
- Pentre Road Slip (J37) to St Clears Roundabout (J41).

Where the site does not meet the personal injury collision and/or 85th percentile speed thresholds, the suitability of the site conditions has not been explored further.

A summary of the speed enforcement requirements assessment is provided in **Table 2-15**.

Criteria	Recorded Value		Existing De-Restricted Speed Limit (70mph)		
			Fixed	Mobile	Route
Full Route (Carmarthen to St Clears)					
Route Length	13.7km		×	×	✓
KSI	EB	5 = 0.4/km			×
	WB	10 = 0.7/km			×
Collisions	EB	40 = 2.9/km			×
	WB	59 = 4.3/km			×
85th Percentile Speeds	EB	65mph			×
	WB	65mph			×
Travellers Rest to Meidrim					
Route Length	4.6km		×	✓	×
KSI	EB	4 = 0.9/km		×	
	WB	1 = 0.2/km		×	
Collisions	EB	31 = 6.7/km		×	
	WB	12 = 2.6/km		×	
85th Percentile Speeds	EB	66mph		×	
	WB	67mph		×	
Meidrim to Bancyfelin					
Route Length	4.7km		×	✓	×
KSI	EB	1 = 0.2/km		×	
	WB	5 = 1.1/km		✓	
Collisions	EB	8 = 1.7/km		×	
	WB	28 = 6.0/km		×	
85th Percentile Speeds	EB	67mph		×	
	WB	68mph		×	

Criteria	Recorded Value		Existing De-Restricted Speed Limit (70mph)		
			Fixed	Mobile	Route
Bancyfelin to Pentre Road Slip					
Route Length	3.5km		×	✓	×
KSI	EB	0 = 0/km		×	
	WB	2 = 0.6/km		×	
Collisions	EB	1 = 0.3/km		×	
	WB	8 = 2.3/km		×	
85th Percentile Speeds	EB	65mph		×	
	WB	66mph		×	
Pentre Road Slip and St. Clears Roundabout					
Route Length	0.9km		✓	✓	×
KSI	EB	0 = 0/km	×	×	
	WB	2 = 2.2/km	×	✓	
Collisions	EB	0 = 0/km	×	×	
	WB	11 = 12.2/km	×	✓	
85th Percentile Speeds	EB	62mph	×	×	
	WB	60mph	×	×	

Table 2-15 *Assessment of Speed Enforcement Requirements*

Based on the assessment, it is considered that speed enforcement cameras are not justified for the sites/routes evaluated above and therefore the scheme area, at this stage. However, if the speed limit is reduced to 50mph along any section of the scheme area, it may be considered appropriate to further investigate enforcement along the route or at specific sites. This would need further assessment in the form of speed surveys and up-to-date personal injury collision analysis following the implementation of the new speed limit.

Therefore, for the purpose of this WelTAG Stage Two study, it is not considered that speed enforcement measures are necessary at this stage and no option has been further developed for assessment.

Amendments to Junctions (VI4, VI5 & VI6)

It is considered that amendments to junctions, in the form of closure of cross-carriageway manoeuvre opportunities (VI4), full closures (VI5), or junction amendments (VI6), could significantly improve safety within the scheme area (TPO1), through addressing a number of known transport problems. On this basis, a range of at-grade options have been developed at each of the junctions within the scheme area for further consideration.

Potential Options

Options have been considered which vary in scale of intervention, ranging from **Do Minimum** through to **Do Something**, and **Do More.** The options have been categorised as follows:

- **Do Minimum –** minor improvements to the existing layouts to upgrade the junctions to current standards for critical parameters, where practicable. It should be noted that if a do-minimum option is taken forward to Stage Three then full parameter checks based on topographical surveys will be undertaken as part of the detailed design process;
- **Do Something –** interventions based on the review of junctions, in addition to minor improvements to the existing layouts to upgrade the junctions to current standards, where practicable; and
- **Do More –** interventions based on the review of junctions, in addition to larger scale improvements to the junction layouts in the form of merge and/or diverge lanes, which may be considered appropriate.

The options have been assessed at each of the junctions, and compared with the Do-Nothing scenario, whereby no change is made to the existing layout, to identify preferred solutions at each of the junctions along the length of the scheme area..

It should be noted that the development of the options has been based on OS mapping and the existing situation. Whilst the committed SUP has not been included within the outline designs, consideration has been given to whether the committed scheme could be incorporated as part of the detailed design.

Meidrim (J14)

Although the interventions investigated as part of this WelTAG study relate to relatively minor at-grade improvements, it is noted that a previous study (A40 Meidrim Junction Improvement (2017)) considered the potential for an intervention at the Meidrim junction (J14). In addition to this study, an Addendum has been completed to investigate the potential for a grade-separated westbound junction at Sarnau, which is located approximately 1.75 km to the west of the Meidrim junction (J14).

As part of the studies, a range of smaller and larger scale interventions were investigated to assist in minimising the safety risk at the Meidrim junction (J14). It should be noted that the smaller-scale options previously investigated have been considered in the development of the Do Minimum and Do Something options at the junction.

This being said, it is noted that the previous study also considered the following larger scale interventions at the junction:

- Compact grade-separated junction;
- Large three-arm 60m ICD roundabout; and
- Grade-separated westbound junction at Sarnau.

Although none of the previously investigated options have currently been progressed at the Meidrim junction (J14), it is considered appropriate that further consideration of a preferred larger scale option (Do More) is undertaken as part of this WelTAG Stage Two study. In order to identify a preferred larger scale intervention to consider at Meidrim, the potential options have been considered in the context of the identified TPOs.

With this in mind, it should be noted that the compact grade-separated junction at Meidrim (J14) forms the J14DMo(b) option, which is summarised in the following section. It should also be noted that, as the provision of a grade-separated turning opportunity at the Meidrim junction (J14) has an impact on u-turning opportunities within the scheme area, a with and without grade-separated scheme at Meidrim scenario has been considered in the development of the Do Something options detailed below.

Review of Junctions

The development of the Do Something options has been informed by a review of existing conditions, with consideration given to the following:

- Collision data at the junctions for the latest five years of available data at time of writing;
- Traffic data, based on a manual classified turning count undertaken in October / November 2016;
- Diversion lengths;
- Access arrangements and potential alternative routes to the A40 trunk road;
- Existing geometries in the context of current design standards; and
- The requirement for merge and/or diverge lanes according to DMRB CD 123[20].

The purpose of the review was to identify junctions where amendments could be required to improve safety (TPO1), which is considered to be a principal consideration in the development of any preferred solution(s) within the scheme area.

[20] Standards for Highways (2020) *CD 123 – Geometric design of at-grade priority and signal-controlled junctions*. Available online: https://www.standardsforhighways.co.uk/dmrb/search/5770900b-eadc-4adf-b4e0-a80ceb08b839

In order to maximise the potential benefits to safety, it is considered that a preferred option should seek to remove conflict between mainline A40 traffic and movements to / from the minor arms, unless any information identified within the review suggested this would not be appropriate. This principle of assessment has subsequently been utilised to assist in the identification of practicable **Do Something** options at each of the junctions.

A red, amber, green (RAG) rating has been utilised as part of the review to determine what level of intervention, in terms of restricting manoeuvres, may be practicable:

- **Red –** Significant challenge, or no justification to full closure of junction;
- **Amber –** Some evidence to support full closure of junction or restriction of movements;
- **Green –** Notable evidence or opportunity to support full closure or restriction of movements; and
- **Grey –** No data available to inform assessment / not applicable.

A summary of the RAG scoring parameters for each of the review criteria is provided in **Table 2-16**.

Criteria	Red	Amber	Green
Collision Data	No collisions recorded.	Collision recorded.	Cross-carriageway collision recorded.
Traffic Data	Notable traffic demand[21] on minor arm.	Minor traffic demand for right-turn movements.	Minor traffic demand on minor arm.
Diversion Routes	Approximate journey times of more than 10 minutes along A40 to next appropriate u-turning opportunity[22] and back if right-turns are restricted.	Approximate journey times between five and 10 minutes along A40 to next appropriate u-turning opportunity and back if right-turns are restricted.	Approximate journey times under five minutes along A40 to next appropriate u-turning opportunity and back if right-turns are restricted.
Junction Usage	N/A	Junction / access appears used.	Junction / access appears unused.
Access & Alternative Routes	No alternative route available to A40 trunk road (private access).	Alternative route available to A40 trunk road, although potential constraints identified[23].	Suitable alternative route to A40 trunk road.
Previous Studies[24]	No intervention recommended previously.	Amendments to movements, including closure of the central reservation previously recommended.	Full closure previously recommended.
Design Standards	Existing junction fully complies with current guidance on critical parameters.	Existing junction does not fully comply with current guidance on critical parameters.	Existing right-turn provision and/or visibility does not comply with current guidance.
Merge and/or Diverge Lanes	Merge and/or diverge lane not required according to CD 123.	N/A	Merge and/or diverge lane required according to CD 123.

***Table 2-16** RAG Scoring Parameters*

The results of the RAG assessment are outlined in **Table 2-17**, with a description of the options identified at each of the junctions following. It should however be noted that as so **Do Minimum** options all relate to a review of the existing junction layout and geometric parameters in the context of current standards, no further description has been provided.

[21] 'Notable' traffic demand considered as more than one vehicle every 15 mins across 24 hours (96 daily vehicles).

[22] Existing u-turning facilities considered to be at the Pensarn (J1) and Cross Hands (J15) Roundabouts, as well as at the National Botanic Gardens junction (J12).

[23] Potential constraints include significant length of alternative route, narrow lanes, HDV restrictions and any other notable constraints restricting an increase in traffic demand along the alternative routes.

[24] The previous studies considered are the A48 Junctions Study (2017) (1) and the A48 Phase 1 Study (2008) (2).

Junction			Collision Data	Weekday Traffic Demand[25]	Diversion Routes				Junction Usage	Access & Alternative Routes	Design Standards	Merge & Diverge Lanes
					Existing		With GS Junction at Meidrim					
Ref	Name	Arm			RT Out	RT In	RT Out	RT In				
J5	Travellers Rest	North										
		South		*J5 (North)*								
J6	Market Hall Vets			*J28 (North)*								
J7	Private Access			*J18 (North)*								
J8	Western Power			*J28 (North)*								
J9	Private Access			*J28 (North)*								
J10	Carmarthen Showground											
J11	Ffoshelig Coaches / Agricultural Access	North										
		South										
J12	Tenby Road Filling Station											
J13	Golf Club / Private Access	North										
		South										
J14	Meidrim											
J15	Agricultural Accesses	North										
		South										
J16	Private Access / Bragty	North		*J18 (North)*								
		South		*J18 (South)*								
J17	Agricultural Accesses	North										
		South										
J18	Private Access / Llangynog	North										
		South										
J19	Bancyfelin											
J20	Private Access			*J28 (North)*								
J21	Private Access			*J28 (North)*								
J22	Private Access			*J28 (North)*								
J23	Private Access / Agricultural Access	North		*J28 (North)*								
		South										
J24	CLH Storage			*J13 (South)*								
J25	Private Access			*J13 (South)*								
J26	Bryn-y-Gaer / Private Access	North		*J34*								
		South		*J28 (North)*								
J27a	Private Access			*J28 (North)*								
J27b	Agricultural Access											
J28	Private Access / Eglwys Llanfihangel Abercowin	North										
		South										
J29a	Private Access			*J28 (North)*								

[25] For the junctions where no traffic data is available, comparable junctions have been utilised as demonstrated by the references in italics.

Junction			Collision Data	Weekday Traffic Demand[25]	Diversion Routes				Junction Usage	Access & Alternative Routes	Design Standards	Merge & Diverge Lanes
					Existing		With GS Junction at Meidrim					
Ref	Name	Arm			RT Out	RT In	RT Out	RT In				
J29b	Forge Restaurant, Lodge and Filling Station			*J12*								
J30	Agricultural Access											
J31	Private Access			*J28 (North)*								
J32	Agricultural Access											
J33	Private Access			*J28 (North)*								
J34	Waunbricks											
J35	Agricultural Access											
J36	Coast to Coast Caravans			*J18 (South)*								
J37	Pentre Road Slip											
J38	Agricultural Access											
J39a	Agricultural Access											
J39b	Agricultural Access											
J40	High Street Slips	North										
		South										

Table 2-17 *RAG Assessment Results*

Travellers Rest (J5)

An aerial overview of the Travellers Rest junction (J5) is provided in **Figure 2-23**.

Figure 2-23 *Travellers Rest Junction (J5)*

Do Something

As there are currently no cross-carriageway manoeuvres possible at this junction and there is a notable traffic demand for the minor arms, no Do Something option, above the amendments suggested as part of the Do Minimum option, has been proposed for further consideration in this location.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation	With GS Scheme at Meidrim
• No Do Something Option.	• No Do Something Option.

Do More

As there are currently merge and diverge lanes provided on both the northern and southern arms of the junction, no Do More option is proposed for further consideration in this location.

Market Hall Vets (J6)

An aerial overview of the Market Hall Vets junction (J6) is provided in **Figure 2-24**.

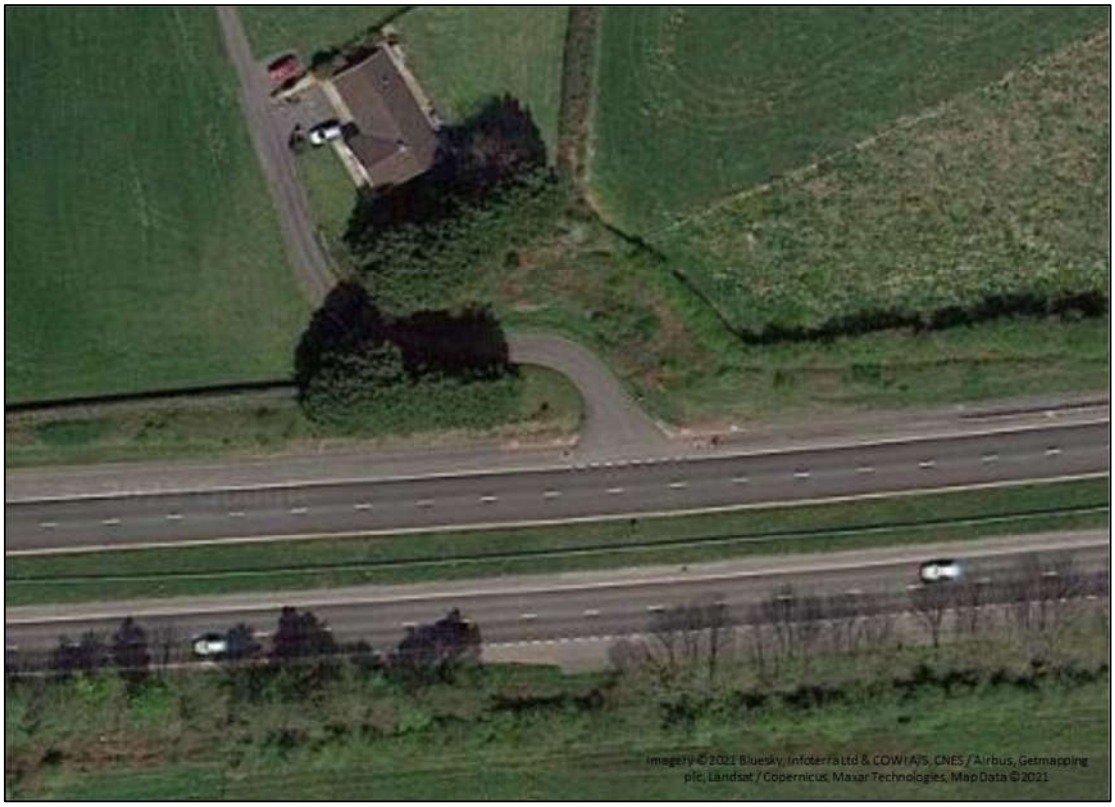


Figure 2-24 *Market Hall Vets Junction (J6)*

Do Something (J6DS(a))

As this junction serves as a private access to a dwelling, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. It should be noted that no cross-carriageway manoeuvres are possible in this location at present.

With this in mind, combined with the estimated low traffic demand, it is considered that a **full closure and relocation of access** through an adjacent field to Llysonnen Road, which provides access through to the Travellers Rest junction (J5), could be appropriate. This would require the construction of an approximately 300m length private access road, with ownership and management of the new route to be agreed with the appropriate landowner(s).

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J6DS(a)	With GS Scheme at Meidrim
• Full closure; • Relocation of access.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J7)

An aerial overview of the Private Access junction (J7) is provided in **Figure 2-25**.

Figure 2-25 *Private Access Junction (J7)*

Do Something (J7DS(a))

As this junction serves as a private access to a dwelling, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. It should be noted that no cross-carriageway manoeuvres are possible in this location at present.

With this in mind, combined with the estimated low traffic demand, it is considered that a **full closure and relocation of access** to the adjacent Market Hall Vets (J6) access road could be appropriate. This would require the construction of an approximately 50m length private access road, with ownership and management of the new route to be agreed with the appropriate landowner(s).

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J7DS(a)	With GS Scheme at Meidrim
• Full closure; • Relocation of access.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Western Power (J8)

An aerial overview of the Western Power junction (J8) is provided in **Figure 2-26.**

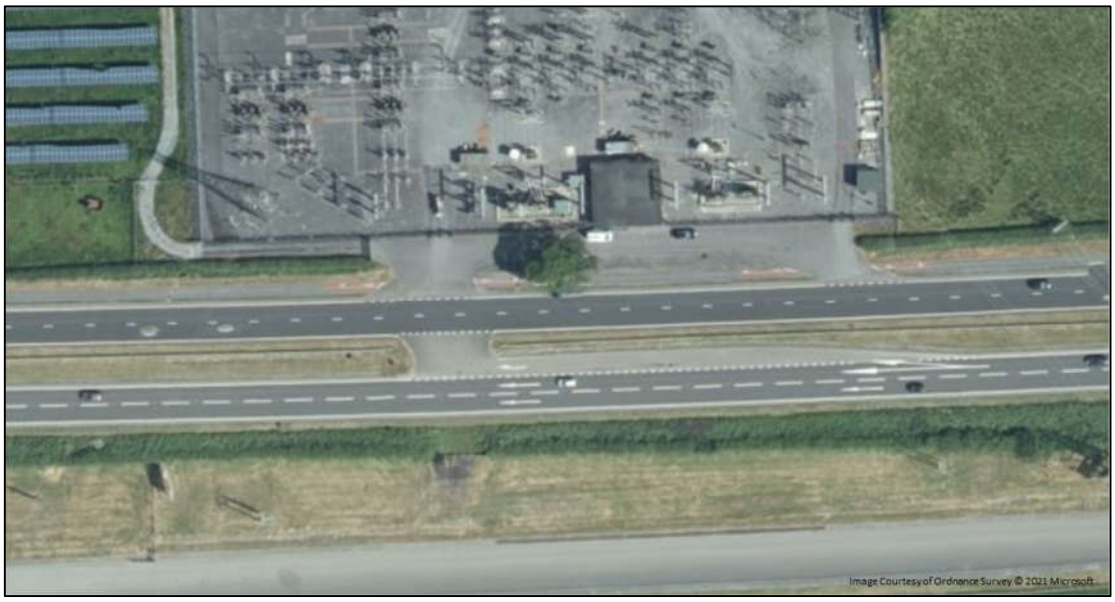


Figure 2-26 *Western Power Junction (J8)*

Do Something (J8DS(a) & J8DS(b))

Although a low level of traffic demand has been estimated at this junction, it is noted that access is required to the electric substation located adjacent to the A40, whilst no alternative route to the site from the highway network is currently available. With this in mind, it is not considered appropriate to close this junction.

This being said, it is noted that there is a potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles into the minor arm is significant (the nearest safe u-turning facility is at the High Street Slips (J40) approximately 10km to the west), it is not considered that restricting this movement is appropriate. However, the diversion length for right-turning out vehicles is considered to be acceptable (approximately three minutes) and therefore the **restriction of right-turn out movement** is considered a potential option.

Further to this, as the central reservation would remain partially open as part of this option, it is proposed that a **u-turn restriction** is implemented to reduce the potential for this inappropriate manoeuvre in both directions.

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that there is the potential for a **closure of the central reservation.** The introduction of a safe u-turning facility at the Meidrim junction (J14) would reduce the diversion journey time for right-turn movements into the minor arm from approximately 14 minutes to three minutes, which is considered to be potentially acceptable.

Existing Situation – J8DS(a)	With GS Scheme at Meidrim – J8DS(b)
• Do Minimum improvements; • Restriction of right-turn out movement; • Restriction of u-turn manoeuvres.	• Do Minimum improvements; • Closure of the central reservation.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J9)

An aerial overview of the Private Access junction (J9) is provided in **Figure 2-27**.

Figure 2-27 *Private Access Junction (J9)*

Do Something (J9DS(a) & J9DS(b))

Although a low level of traffic demand has been estimated at this junction, it is noted that access is required to a dwelling located adjacent to the A40, whilst no alternative route to the site from the highway network is currently available. As there is no clear potential route for a new access road to the dwelling, it is not considered possible to close this junction.

This being said, it is noted that there is a potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles into the minor arm is significant (the nearest safe u-turning facility is at the High Street Slips (J40) approximately 10km to the west), it is not considered that restricting this movement is appropriate. However, the diversion length for right-turning out vehicles is considered to be acceptable (approximately three minutes) and therefore the **restriction of right-turn out movement** is currently a potential option.

Further to this, as the central reservation would remain partially open as part of this option, it is proposed that a **u-turn restriction** is implemented to reduce the potential for this inappropriate manoeuvre.

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that there is the potential for a **closure of the central reservation.** The introduction of a safe u-turning facility at the Meidrim junction (J14) would reduce the diversion journey time for right-turn movements into the minor arm from approximately 14 minutes to three minutes, which is considered to be potentially acceptable.

Existing Situation – J9DS(a)	With GS Scheme at Meidrim – J9DS(b)
• Do Minimum improvements; • Restriction of right-turn out movement; • Restriction of u-turn manoeuvres.	• Do Minimum improvements; • Closure of the central reservation.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Carmarthen Showground (J10)

An aerial overview of the Carmarthen Showground junction (J10) is provided in **Figure 2-28**.

Figure 2-28 *Carmarthen Showground Junction (J10)*

Do Something

As there are currently no cross-carriageway manoeuvres possible at this junction, no Do Something option, above the amendments suggested as part of the Do Minimum option, has been proposed for further consideration in this location. It has been highlighted by CCC that there are plans to utilise the Carmarthen Showground as a hub for its electric bus fleet, which will include the operation of a fleet of eight buses. However it is not considered that this would significantly change the nature of the traffic demand at this location. It is also noted that potential options are being considered as part of a separate study at this location, to investigate instances of subsidence, which will seek to address the Transport Problem identified at WelTAG Stage One, which covers the development of VI19 of this WelTAG study.

It is also not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for a Do Something option at this junction.

Existing Situation	With GS Scheme at Meidrim
• No Do Something Option.	• No Do Something Option.

Do More

It is considered that the estimated traffic demand is likely to be low on a day-to-day basis in this location, due to the purpose of the junction as an access to the Carmarthen Showground during event. In addition, As there are currently merge and diverge lanes provided at the junction, no Do More option is proposed for further consideration in this location.

Ffoshelig Coaches / Agricultural Access (J11)

An aerial overview of the Ffoshelig Coaches / Agricultural Access junction (J11) is provided in **Figure 2-29.**

Figure 2-29 *Ffoshelig Coaches / Agricultural Access Junction (J11)*

Do Something (J11DS(a) & J11DS(b))

Although a low level of traffic demand has been recorded on both arms of this junction, it is noted that access is required to some dwellings and the Ffoshelig Coaches depot to the north of the A40, whilst no alternative route from these sites to the highway network is currently available. With this in mind, it is considered that access needs to be retained to the northern arm of the junction and therefore a full closure is not appropriate.

This being said, it is noted that there is a potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles into the minor arm is significant (the nearest safe u-turning facility is at the High Street Slips (J40) approximately nine km to the west), it is not considered that restricting this movement is appropriate. However, it is considered that a **restriction of the right-turn out movement** from the northern arm of the junction could be appropriate, due to the acceptable diversion length (approximately three minutes).

Further to this, as the central reservation would remain partially open as part of this option, it is proposed that a westbound **u-turn restriction** is implemented to reduce the potential for this inappropriate manoeuvre, noting there is already an eastbound u-turn restriction in place.

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that there is the potential for a **closure of the central reservation.** The introduction of a safe u-turning facility at the Meidrim junction (J14) would reduce the diversion journey time for right-turn movements into the minor arm from approximately 13 minutes to three minutes, which is considered to be potentially acceptable.

As the southern arm is an agricultural access to a field, it is proposed that a **full closure** of the access could be appropriate in both the existing and with a grade-separated scheme at Meidrim (J14) scenarios.

Existing Situation – J11DS(a)	With GS Scheme at Meidrim – J11DS(b)
• Do Minimum improvements (Ffoshelig Coaches arm); • Restriction of right-turn out movement (Ffoshelig Coaches arm); • Full closure (Agricultural Access arm); • Restriction of westbound u-turn manoeuvres.	• Do Minimum improvements (Ffoshelig Coaches arm); • Closure of the central reservation; • Full closure (Agricultural Access arm).

Do More

The recorded traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

This being said, it is noted that this junction would need to be closed to facilitate the Do More option at the adjacent Tenby Road Filling Station junction (J12). The J12DMo option would introduce a new access through / to the rear of the Tenby Road Filling Station, negating the requirement for a retention of this junction.

Tenby Road Filling Station (J12)

An aerial overview of the Tenby Road Filling Station junction (J12) is provided in **Figure 2-30**.

Figure 2-30 *Tenby Road Filling Station (J12)*

Do Something

As there are currently no cross-carriageway manoeuvres possible at this junction, no Do Something option, above the amendments suggested as part of the Do Minimum option, has been proposed for further consideration in this location.

It is also not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for a Do Something option at this junction.

Existing Situation	With GS Scheme at Meidrim
• No Do Something Option.	• No Do Something Option.

Do More (J12DMo(a))

It is noted that there is currently a diverge lane at this junction, with no merge lane provided.

The traffic demand meets the parameters set out in CD 123 for a merge lane and therefore a Do More option for further consideration is required in this location.

As part of this, it is likely that the northern arm of the Ffoshelig Coaches / Agricultural Access (J11) junction will need to be closed, with an alternative access provided from the Tenby Road Filling Station (J12) junction.

Existing Situation – J12DMo(a)	With GS Scheme at Meidrim
• Do Minimum improvements; • Introduction of eastbound merge lane.	• No Do More option.

Golf Club / Private Access (J13)

An aerial overview of the Golf Club / Private Access junction (J13) is provided in **Figure 2-31**.

Figure 2-31 *Golf Club / Private Access (J13)*

Do Something (J13DS(a) & J13DS(b))

Although a low level of traffic demand has been recorded on both arms of this junction, it is noted that access is required to some dwellings and farms on either side of the A40. Although there is a potential alternative route to the highway network from the dwellings located on the northern side of the A40, it is noted that this route is minor and unsuitable for any larger goods vehicles, whilst no alternative route to the highway network is available for the dwellings and farms located to the southern side of this junction. On this basis, it is considered that access from both sides of this junction is required and a full closure is not appropriate.

This being said, it is noted that there is a potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles into the northern and out of the southern minor arm is significant (the nearest safe u-turning facility is at the High Street Slips (J40) approximately eight km to the west), it is not considered that restricting these movements is appropriate. However, it is considered that a **restriction of the right-turn out movement** from the northern arm of the junction and a **restriction of the right-turn in movement** to the southern arm could be appropriate, due to the acceptable diversion length (approximately four minutes).

Further to this, as the central reservation would remain partially open as part of this option, it is proposed that a **u-turn restriction** is implemented to reduce the potential for this inappropriate manoeuvre in both directions.

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that there is the potential for a **closure of the central reservation.** The introduction of a safe u-turning facility at the Meidrim junction (J14) would reduce the diversion journey time for right-turn movements in and out of the northern and southern minor arms, respectively, from approximately 12 minutes to three minutes, which is considered to be potentially acceptable.

Existing Situation – J13DS(a)	With GS Scheme at Meidrim – J13DS(b)
• Do Minimum improvements; • Restriction of right-turn out movement (Golf Club arm); • Restriction of right-turn in movement (Private Access arm); • Restriction of u-turn manoeuvres.	• Do Minimum improvements; • Closure of the central reservation.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Meidrim (J14)

An aerial overview of the Meidrim junction (J14) is provided in **Figure 2-32**.

Figure 2-32 *Meidrim Junction (J14)*

Do Something (J14DS(a(i)) and J14DS(a(ii)))

The review of junctions has identified that the Meidrim junction (J14) is a key interchange along the A40 between Carmarthen and St Clears, providing access to the B4298 towards Meidrim and through towards a number of other rural communities. On this basis, it is considered that appropriate access should be retained at this junction, noting the moderate traffic demand for journeys to and from the east of the junction (Carmarthen).

It has however been noted that there is currently a limited traffic demand for the left-turn in and right-turn out movements from the minor arm (west direction), with a daily total of approximately 78 and 40 recorded making these movements, respectively. With this in mind, it is considered that a **restriction of the left-turn in and right-turn out movements** could be appropriate in this location. It should be noted that previous investigations have been undertaken in this location, due to the known safety concerns associated with the junction, and therefore minimising use of the minor arm at this junction specifically could be considered appropriate.

Further to this, as the central reservation would remain partially open as part of this option, it is proposed that a westbound **u-turn restriction** is implemented to reduce the potential for this inappropriate manoeuvre, noting there is already an eastbound u-turn restriction in place.

In addition, a potential option to **maintain the left-turn in** has been identified. This option could enable a larger intervention at the Bancyfelin junction (J19), as it would maintain access to the B4298 for those utilising the Bragty and Llangynog arms at J16 and J18, respectively.

Existing Situation – J14DS(a(i)) & J14 DS(a(ii))	With GS Scheme at Meidrim
• **J14DS(a(i)):** • Do Minimum improvements; • Restriction of right-turn out movement; • Restriction of left-turn in movement; • Restriction of westbound u-turn manoeuvres. • **J14DS(a(ii)):** • Do Minimum improvements; • Restriction of right-turn out movement; • Restriction of westbound u-turn manoeuvres	• No Do Something option.

Do More (J14DMo(a(i)), J14DMo(a(ii)) & J14DMo(b))

Based on the estimated traffic demand at the junction, it is considered that a merge lane is required in this location, in line with CD 123. It should be noted that the estimated diverge traffic demand was low and therefore only a merge lane is required according to CD 123.

On this basis, a Do More option at this junction includes the provision of a **new merge lane for eastbound traffic**, in addition to the improvements recommended as part of both options J14DS(a(i)) and J14DS(a(ii)).

It is considered that an additional Do More option at this junction is the **compact grade-separated junction at Meidrim** (J14), considered as part of the A40 Meidrim Junction Improvement study. It should be noted that the previous design has been reviewed, with appropriate amendments made to ensure the concept is in line with current standards.

Existing Situation – J14DMo(a(i)) & J14DMo(a(ii))	With GS Scheme at Meidrim – J14DMo(b)
• **J14DMo(a(i)):** • J14DS(a(i)) improvements; • Introduction of eastbound merge lane. • **J14DMo(a(ii)):** • J14DS(a(ii)) improvements; • Introduction of eastbound merge lane.	• Compact grade-separated junction.

Agricultural Accesses (J15)

An aerial overview of the Agricultural Accesses junction (J15) is provided in **Figure 2-33**.

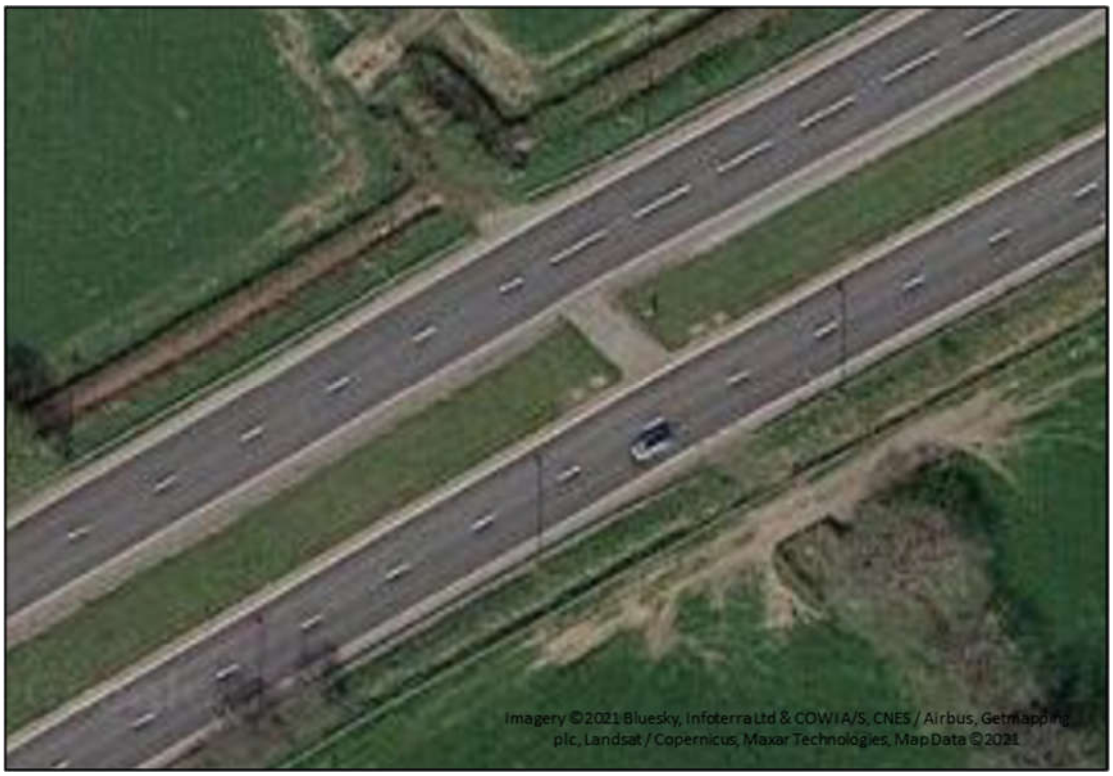


Figure 2-33 *Agricultural Access Junction (J15)*

Do Something (J15DS(a))

Based on the nature of this junction as two agricultural accesses to adjoining fields, it has been estimated that the traffic demand is limited in this location.

In addition, it appears that both accesses are currently unused and therefore a **full closure** of both accesses, including a closure of the gap in the central reservation, could be appropriate.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J15DS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access / Bragty (J16)

An aerial overview of the Private Access / Bragty junction (J16) is provided in **Figure 2-34**.

Figure 2-34 *Private Access / Bragty Junction (J16)*

Do Something (J16DS(a))

It is noted that the northern arm of this junction is a private access with an estimated low traffic demand that also links through to the parallel Llysonnen Road, which in turn links to the Meidrim (J14) and Bancyfelin (J19) junctions for access to the A40. On this basis, it is considered that a **full closure** of the northern arm of this junction is appropriate.

Whilst it is also estimated that the traffic demand is low on the southern arm, it is noted that the route linking to the minor arm from the surrounding highway network is unsuitable for larger goods vehicles. Therefore, as larger goods vehicles would not be able to access the small number of dwellings and farms located to the south of this junction, a full closure of the arm is not considered to be appropriate.

This being said, it is noted that there is a potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles out of the southern minor arm is significant (the nearest safe u-turning facility is at the High Street Slips (J40), increasing journey times by approximately 10 minutes), it is not considered that restricting this movement is appropriate. However, it is considered that a **restriction of the right-turn in movement** into the southern arm of the junction could be appropriate, due to the acceptable diversion length (approximately six minutes) for a low number of vehicles.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J16DS(a)	With GS Scheme at Meidrim
• Full closure (Private Access arm); • Do Minimum improvements (Bragty arm); • Restriction of right-turn in movement (Bragty arm).	• No Do Something option.

Do More

Although a slight traffic demand is estimated for the southern arm of this junction (Bragty), the demand is not expected to currently exceed the parameters set out in CD 123 and therefore it is not considered that merge and/or diverge lanes are required in this location.

This being said, it is considered that traffic demand should be monitored at this junction, with the potential requirement for a merge and/or diverge lane in the future with traffic growth.

Agricultural Accesses (J17)

An aerial overview of the Agricultural Accesses junction (J17) is provided in **Figure 2-35.**

Figure 2-35 *Agricultural Access Junction (J17)*

Do Something (J17DS(a))

Based on the nature of this junction as two agricultural accesses to adjoining fields, it has been estimated that the traffic demand is limited in this location.

In addition, it appears that both accesses are currently unused and therefore a **full closure** of both accesses, including a closure of the gap in the central reservation, could be appropriate.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J17DS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access / Llangynog (J18)

An aerial overview of the Private Access / Llangynog junction (J18) is provided in **Figure 2-36.**

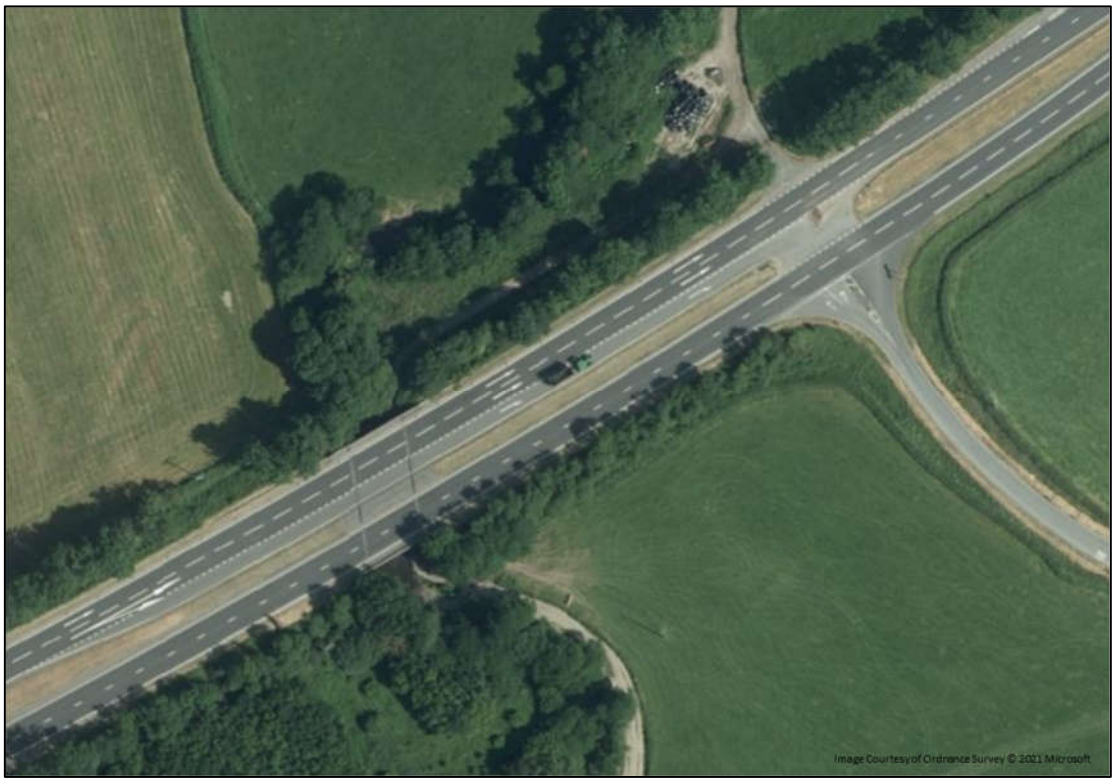


Figure 2-36 *Private Access / Llangynog Junction (J18)*

Do Something (J18DS(a) & J18DS(b))

It is noted that the northern arm of this junction is a private access with an estimated low traffic demand that also links through to the parallel Llysonnen Road, which in turn links to the Meidrim (J14) and Bancyfelin (J19) junctions for access to the A40. On this basis, it is considered that a **full closure** of the northern arm of this junction is appropriate.

Whilst a limited traffic demand has been recorded at the northern arm, a total daily demand of approximately 1,000 vehicles has been recorded on the southern arm, which is considered to be a moderate demand. On this basis, it is not considered that a full closure of the southern arm is appropriate at this junction.

In addition, it is noted that the diversion length for right-turning vehicles in and out of the southern arm is relatively long, approximately nine and seven minutes, respectively. Due to the moderate traffic demand for these movements, it is not considered that increasing journey lengths by this extent for a number of people is appropriate and therefore it is not proposed that any changes to the right-turn movements to and from the southern arm of this junction are made (with the exception of the changes proposed in J18DMin).

This being said, as the central reservation would remain open as part of this option, it is proposed that an eastbound **u-turn restriction** is implemented to reduce the potential for this inappropriate manoeuvre, noting there is currently a westbound restriction in place.

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that there is the potential for a **restriction of the right-turn in movement**. The introduction of a safe u-turning facility at the Meidrim junction (J14) would reduce the diversion journey time for right-turn movements into the southern minor arm from approximately nine minutes to five minutes, which is considered to be potentially acceptable.

Existing Situation – J18DS(a)	With GS Scheme at Meidrim – J18DS(b)
• Full closure (Private Access arm); • Do Minimum improvements (Llangynog arm); • Restriction of eastbound u-turn manoeuvres.	• J18DS(a) improvements; • Restriction of right-turn in movement (Llangynog arm).

Do More

Although a moderate traffic demand is estimated for the southern arm of this junction (Llangynog), the demand does not currently exceed the parameters set out in CD 123 and therefore it is not considered that merge and/or diverge lanes are required in this location.

This being said, it is considered that traffic demand should be monitored at this junction, with the potential requirement for a merge and/or diverge lane being dependent on future traffic flows.

Bancyfelin (J19)

An aerial overview of the Bancyfelin junction (J19) is provided in **Figure 2-37**.

Figure 2-37 *Bancyfelin Junction (J19)*

Do Something (J19DS(a(i)), J19 DS(a(ii)) & J19DS(b))

Due to a moderate traffic demand of approximately 1,000 being recorded at this junction and the location of the junction providing access to the settlement of Bancyfelin, it is not considered that a closure of this junction is appropriate.

This being said, the WelTAG Stage One study and stakeholder feedback identified the junction as a potential safety concern, particularly noting the safety risks for buses on the minor arm. However, following a review of the junction, it is not considered that a restriction to any cross-carriageway manoeuvre is currently a suitable intervention, if the left-turn in movement is restricted as part of option DS(a(i)) at the Meidrim junction (J14) as this would effectively sever the B4298 and Bancyfelin from settlements to the south of the A40 such as Llangynog. With this in mind, it is proposed to that a westbound **u-turn restriction** is implemented to reduce the potential for this inappropriate manoeuvre, noting there is currently an eastbound restriction in place, as part of option DS(a(i)).

If option DS(a(ii)) is progressed at the Meidrim junction (J14), it is considered that it may be appropriate to **restrict the right-turn in movement** to Bancyfelin as part of an option at this junction. Whilst this would lead to an increase in journey times and distances for some drivers, it is noted that the right-turn movement from the A40 could be undertaken at the upstream Meidrim junction (J14) or via a u-turn at the St Clears Roundabout (J41).

It is considered that a **closure of the central reservation**, as well as a **restriction of the left-turn out movement**, could be appropriate with the introduction of a grade-separated junction at Meidrim (J14). It is considered that a grade-separated scheme would allow people to access Bancyfelin from the Meidrim junction (J14), enabling a restriction of a number of the movements at the Bancyfelin junction (J19). It is however considered that the existing eastbound diverge lane should remain at this junction, with appropriate Do Minimum improvements, in this scenario.

Existing Situation – J19DS(a(i)) & J19DS(a(ii))
• **J19DS(a(i)):** • Do Minimum improvements; • Restriction of westbound u-turn manoeuvres. • **J19DS(a(ii)):** • Do Minimum improvements; • Restriction of right-turn in movement; and • Restriction of westbound u-turn manoeuvres.

With GS Scheme at Meidrim – J19DS(b)
• Do Minimum improvements; • Closure of the central reservation; • Restriction of left-turn out movement.

Do More

Based on the estimated traffic demand at the junction, it is considered that a diverge lane is required in this location, in line with CD 123. It should be noted that the estimated merge traffic demand was low and therefore only a diverge lane is required according to CD 123.

This being said, as there is currently a diverge lane provided at this junction, no Do More option is proposed for further consideration in this location.

Private Access (J20)

An aerial overview of the Private Access junction (J20) is provided in **Figure 2-38**.

Figure 2-38 *Private Access Junction (J20)*

Do Something (J20DS(a))

As this junction serves as a private access to a dwelling and farm, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. It should be noted that no cross-carriageway manoeuvres are possible in this location at present.

With this in mind, combined with the estimated low traffic demand, it is considered that a **full closure and relocation of access** to the nearby Llysonnen Road, which provides access to both the Meidrim (J14) and Bancyfelin (J19) junctions, could be appropriate. This would require the construction of an approximately 350m length private access road, with ownership and management of the new route to be agreed with the appropriate landowner(s).

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J20DS(a)	With GS Scheme at Meidrim
• Full closure; • Relocation of access.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J21)

An aerial overview of the Private Access junction (J21) is provided in **Figure 2-39**.

Figure 2-39 *Private Access Junction (J21)*

Do Something (J21DS(a) and J21DS(b))

The junction serves as a private access to a farm located to the south of the A40. It is however noted that this minor arm links through to the access road that serves the Private Access junction (J25).

It is not considered that access is required from two junctions to serve the two farms located to the south of the A40 in this area, however it is noted that J25 is not an all-movement junction and therefore access is not currently provided eastbound in this location. With this in mind, it is proposed to provide a **restriction to all movements except for the right-turn in movement** at this junction, with access for all other manoeuvres via J25. It is however noted that ownership and management of the route to the trunk road may need to be agreed with the appropriate landowner(s).

In addition to the above, it is considered that the introduction of a grade-separated junction at Meidrim (J14) would present the opportunity for a **full closure** in this location.

Existing Situation – J21DS(a)	With GS Scheme at Meidrim – J21DS(b)
• Do Minimum improvements; • Restriction of left-turn in movement; • Restriction of left-turn out movement; • Restriction of right-turn out movement.	• Full closure.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J22)

An aerial overview of the Private Access junction (J22) is provided in **Figure 2-40**.

Figure 2-40 *Private Access Junction (J22)*

Do Something (J22DS(a) & J22DS(b))

As this junction serves as a private access to a dwelling and farm, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. Despite this, it is noted that cross-carriageway manoeuvres are permitted at this junction, although it is estimated that there is a low demand for any movements to and from the minor arm due to the nature of the route.

With this in mind, it is considered that there is potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles out of the minor arm is significant (the nearest safe u-turning facility is at the Travellers Rest junction (J5) approximately eight km to the east), it is not considered that restricting this movement is appropriate. However, it is considered that a **restriction of the right-turn in movement** to the minor arm of the junction could be appropriate, due to the acceptable diversion length (approximately five minutes) for a small number of vehicles.

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that there is the potential to also restrict the right-turn out movement from the minor arm, which would lead to a **closure of the central reservation**. The introduction of a safe u-turning facility at the Meidrim junction (J14) would reduce the diversion journey time for right-turn movements from the minor arm from approximately 11 minutes to seven minutes, which is considered to be potentially acceptable for the estimated low number of vehicles currently making this manoeuvre.

Existing Situation – J22DS(a)	With GS Scheme at Meidrim – J22DS(b)
• Do Minimum improvements; • Restriction of right-turn out movement.	• Do Minimum improvements; • Closure of the central reservation.

<u>Do More</u>

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access / Agricultural Access (J23)

An aerial overview of the Private Access / Agricultural Access junction (J23) is provided in **Figure 2-41**.

Figure 2-41 *Private Access / Agricultural Access Junction (J23)*

Do Something (J23DS(a))

Based on the nature of this junction as a private access and an agricultural access to adjoining fields, it has been estimated that the traffic demand is limited in this location.

With this in mind, it is considered that a **full closure and relocation of access** to the nearby Private Access junction (J23) could be appropriate for the north arm. This would require the construction of an approximately 175m length private access road, with ownership and management of the new route to be agreed with the appropriate landowner(s).

Whilst the southern agricultural access is currently paved and therefore may still be in use, it is considered that a **full closure** could be appropriate due to the inappropriate access arrangement direct from the trunk road.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J23DS(a)	With GS Scheme at Meidrim
• Full closure; • Relocation of access (Private Access arm).	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

CLH Storage (J24)

An aerial overview of the CLH Storage junction (J24) is provided in **Figure 2-42**.

Figure 2-42 *CLH Storage Junction (J24)*

Do Something (J24DS(a) & J24DS(b))

As this junction serves as a direct access to the CLH Storage site, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. Despite this, it is noted that cross-carriageway manoeuvres are permitted at this junction, although it is estimated that there is a relatively low demand for movements to and from the minor arm due to the nature of the adjoining business.

With this in mind, it is considered that there is a potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles out of the minor arm is significant (the nearest safe u-turning facility is at the Travellers Rest junction (J5) approximately eight km to the east), it is not considered that restricting this movement is appropriate. However, it is considered that a **restriction of the right-turn in movement** to the minor arm of the junction could be appropriate, due to the acceptable diversion length (approximately five minutes) for a small number of vehicles.

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that there is the potential to also restrict the right-turn out movement from the minor arm, which would lead to a **closure of the central reservation**. The introduction of a safe u-turning facility at the Meidrim junction (J14) would reduce the diversion journey time for right-turn movements from the minor arm from approximately 11 minutes to seven minutes, which is considered to be potentially acceptable for the estimated low number of vehicles currently making this manoeuvre. Although it is acknowledged this intervention would increase journey times to the business(es) located within the CLH Storage facility, it is noted that the business(es) is unlikely to attract pass-by trips and therefore permanent changes to the junction layout in the interest of public safety could be appropriate.

Existing Situation – J24DS(a)	With GS Scheme at Meidrim – J24DS(b)
• Do Minimum improvements; • Restriction of right-turn in movement.	• Do Minimum improvements; • Closure of the central reservation.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J25)

An aerial overview of the Private Access junction (J25) is provided in **Figure 2-43**.

Figure 2-43 *Private Access Junction (J25)*

Do Something

This junction provides access to a dwelling and farm, whilst also linking through to the track that forms the minor arm of the Private Access (J23) junction. As both accesses serve the same small number of dwellings and farms, it is not considered that both direct accesses to the A40 are required. With this in mind, and as it appears some improvements were made to this access in 2015 / 2016 (planning permission granted on 10/06/2015[26]), it is considered that access should be retained at this junction.

As the junction only provides left-in / left-out access to the A40, no improvements above the amendments suggested as part of the J25DMin option is proposed for further consideration in this location.

On this basis, there is **no Do Something option** proposed for this junction.

Existing Situation	With GS Scheme at Meidrim
• No Do Something Option.	• No Do Something Option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Bron-y-Gaer / Private Access (J26)

An aerial overview of the Bron-y-Gaer/Private Access junction (J26) is provided in **Figure 2-44**.

[26] Carmarthenshire County Council (2021) *Search for a Planning Application (W/31943)*. Available online: http://planning.carmarthenshire.gov.uk/AniteIM.WebSearch/(S(f20qjiaegdgqzm5s4xqewyi1))/Results.aspx

Figure 2-44 *Bron-y-Gaer / Private Access Junction (J26)*

Do Something (J26DS(a) & J26DS(b))

Although there is an estimated low traffic demand on both arms of this junction, it is considered that access needs to be retained from both arms. Whilst there is a potential alternative route to the highway network from the northern arm, this route would significantly increase journey distances and is largely unsuitable for larger goods vehicles and therefore access to the A40 at this junction is required. The southern arm is a private access to a dwelling where there is currently no alternative route to the highway network and therefore a full closure of this arm is also not appropriate.

This being said, it is noted that there is a potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles out of the northern and into the southern minor arm is significant (the nearest safe u-turning facility is at the Travellers Rest junction (J5) approximately nine km to the east), it is not considered that restricting these movements is appropriate. However, it is considered that a **restriction of the right-turn in movement** to the northern arm of the junction and a **restriction of the right-turn out movement** from the southern arm could be appropriate, due to the acceptable diversion length (approximately four minutes).

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that there is the potential to also restrict the remaining cross-carriageway manoeuvres in this location, leading to a **closure of the central reservation**. The introduction of a safe u-turning facility at the Meidrim junction (J14) would reduce the diversion journey time for right-turn movements from the northern arm and into the southern arm from approximately 11 minutes to seven minutes, which is considered to be potentially acceptable for the estimated low number of vehicles currently making these manoeuvres.

Existing Situation – J26DS(a)	With GS Scheme at Meidrim – J26DS(b)
• Do Minimum improvements; • Restriction of right-turn in movement (Bron-y-Gaer arm); • Restriction of right-turn out movement (Private Access arm).	• Do Minimum improvements; • Closure of the central reservation.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J27a)

An aerial overview of the Private Access junction (J27a) is provided in **Figure 2-45**.

Figure 2-45 *Private Access Junction (J27a)*

Do Something (J27aDS(a))

As this junction serves as a private access to a dwelling, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. It should be noted that no cross-carriageway manoeuvres are possible in this location at present.

With this in mind, combined with the estimated low traffic demand, it is considered that a **full closure and relocation of access** to the adjacent northern arm of the Bryn-y-Gaer / Private Access junction (J26) could be appropriate. This would require the construction of an approximately 150m length private access road, with ownership and management of the new route to be agreed with the appropriate landowner(s).

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J27aDS(a)	With GS Scheme at Meidrim
• Full closure; • Relocation of access.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Agricultural Access (J27b)

An aerial overview of the Agricultural Access junction (J27b) is provided in **Figure 2-46**.

Figure 2-46 *Agricultural Access Junction (J27b)*

Do Something (J27bDS(a))

Based on the nature of this junction as an agricultural access to adjoining fields, it is considered that the traffic demand is limited in this location, though there is some anecdotal evidence of usage of the access.

This being said, it is noted in paragraph 3.9 of CD 169 that junctions and accesses shall not be located within laybys, and therefore a **full closure** of the junction is proposed as part of this option.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J27bDS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access / Eglwys Llanfihangel Abercowin (J28)

An aerial overview of the Private Access/Eglwys Llanfihangel Abercowin junction (J28) is provided in **Figure 2-47**.

Figure 2-47 *Private Access / Eglwys Llanfihangel Abercowin Junction (J28)*

Do Something (J28DS(a) & J28DS(b))

Although a relatively low level of traffic demand has been recorded on both arms of this junction, it is noted that access is required on the northern side to a working farm, with the southern arm linking to a number of small rural settlements. Although there is a potential alternative route to the highway network from the dwellings located on the southern side of the A40, it is noted that this route is minor and unsuitable for any larger goods vehicles, whilst no alternative route to the highway network is available for the farm located to the north of this junction. On this basis, it is considered that access from both sides of this junction is required and a full closure is not appropriate.

This being said, it is noted that there is a potential to restrict some cross-carriageway manoeuvres in this location to reduce the potential for collisions. As the diversion length for right-turning vehicles out of the northern and into the southern minor arm is significant (the nearest safe u-turning facility is at the Travellers Rest junction (J5) approximately nine km to the west), it is not considered that restricting these movements is appropriate. However, it is considered that a **restriction of the right-turn in movement** to the northern arm of the junction and a **restriction of the right-turn out movement** from the southern arm could be appropriate, due to the acceptable diversion length (approximately four minutes).

If a grade-separated scheme is implemented at Meidrim (J14), it is considered that a **restriction of the right-turn out movement** from the northern arm of this junction could be appropriate. The introduction of a safe u-turning facility at the Meidrim junction (J14) could reduce the diversion journey time for right-turn movements from the northern arm and into the southern arm from approximately 12 minutes to eight minutes, which is considered to be potentially acceptable for the recorded low number of vehicles currently making these manoeuvres (no vehicles were recorded making this movement as part of the traffic survey undertaken at WelTAG Stage One).

It should however be noted that it is proposed to retain the right-turn movement into the southern arm of the junction. It has been recorded that there is a moderate traffic demand for this manoeuvre (approximately 160 daily vehicles), whilst stakeholder feedback from the nearby Forge Restaurant and Lodge suggested that retaining this manoeuvre to enable people to u-turn on the minor adjoining arm to access their site, is essential for the operation of their site. With this in mind, it is not considered that a full closure of the central reservation is appropriate even with a grade-separated junction at Meidrim (J14).

Existing Situation – J28DS(a)
• Do Minimum improvements; • Restriction of right-turn in movement (Private Access arm); • Restriction of right-turn out movement (Eglwys Llanfihangel Abercowin arm).

With GS Scheme at Meidrim – J28DS(b)
• Do Minimum improvements; • Restriction of right-turn in and out movements (Private Access arm); • Restriction of right-turn out movement (Eglwys Llanfihangel Abercowin arm).

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J29a)

An aerial overview of the Private Access junction (J29a) is provided in **Figure 2-48**.

Figure 2-48 *Private Access Junction (J29a)*

Do Something (J29aDS(a))

As this junction serves as a private access to a dwelling and farm, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. It should be noted that no cross-carriageway manoeuvres are possible in this location at present.

With this in mind, combined with the estimated low traffic demand, it is considered that a **full closure and relocation of access** to the northern arm of the nearby Private Access / Eglwys Llanfihangel Abercowin junction (J28), could be appropriate. This would require the construction of an approximately 275m length private access road, with ownership and management of the new route to be agreed with the appropriate landowner(s).

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J29aDS(a)	With GS Scheme at Meidrim
• Full closure; • Relocation of access.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Forge Restaurant, Lodge and Filling Station (J29b)

An aerial overview of the Forge Restaurant, Lodge and Filling Station junction (J29b) is provided in **Figure 2-49**.

Figure 2-49 *Forge Restaurant, Lodge and Filling Station Junction (J29b)*

Do Something (J29bDS(a))

As this junction serves as a direct access to the Forge Restaurant, Lodge and Filling Station site, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. This being said, it is noted that the existing junction is an informal merge / diverge arrangement, which is estimated to accommodate a moderate traffic demand.

With this in mind, in addition to the amendments to the existing geometries included within the J29bDMin option, it is proposed to **rationalise the layout within the site**, and **reduce the opportunity for ad-hoc parking** adjacent to the main carriageway.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J29bDS(a)	With GS Scheme at Meidrim
• Do Minimum improvements; • Rationalisation of site layout; • Restriction to ad-hoc parking arrangements.	• No Do Something option.

Do More (J29bDMo(a))

Based on the estimated traffic demand at the junction, it is considered that merge and/or diverge lanes are required in this location, in line with CD 123.

Although there is currently an informal merge and diverge arrangement for access to and from the adjacent site, it is proposed to provide a formal merge and diverge lane as part of the Do More option for further consideration, which also includes the rationalisation of egress points between the filling station and the Forge.

Existing Situation – J29bDMo(a)	With GS Scheme at Meidrim
• Rationalisation of site layout; • Introduction of westbound merge lane; • Introduction of westbound diverge lane.	• No Do More option.

Agricultural Access (J30)

An aerial overview of the Agricultural Access junction (J30) is provided in **Figure 2-50**.

Figure 2-50 *Agricultural Access Junction (J30)*

Do Something (J30DS(a))

Based on the nature of this junction as an agricultural access to adjoining fields, it has been estimated that the traffic demand is limited in this location. This being said, it is noted that there is a paved access to the gate and therefore it is likely to currently be utilised.

This being said, it is noted in paragraph 3.9 of CD 169 that junctions and accesses shall not be located within laybys, and therefore a **full closure** of the junction is proposed as part of this option.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J30DS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J31)

An aerial overview of the Private Access junction (J31) is provided in **Figure 2-51**.

Figure 2-51 *Private Access Junction (J31)*

Do Something (J31DS(a))

As this junction serves as a private access to a dwelling, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. It should be noted that no cross-carriageway manoeuvres are possible in this location at present.

With this in mind, combined with the estimated low traffic demand, it is considered that a **full closure and relocation of access** to the nearby Forge Restaurant, Lodge and Filling Station (J29b) site could be appropriate. This would require the construction of an approximately 200m length private access road, with ownership and management of the new route to be agreed with the appropriate landowner(s).

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J31DS(a)	With GS Scheme at Meidrim
• Full closure; • Relocation of access.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Agricultural Access (J32)

An aerial overview of the Agricultural Access junction (J32) is provided in **Figure 2-52**.

Figure 2-52 *Agricultural Access Junction (J32)*

Do Something (J32DS(a))

Based on the nature of this junction as an agricultural access to adjoining fields, it has been estimated that the traffic demand is limited in this location.

In addition, it appears the access is currently unused, or used very infrequently, and therefore a **full closure** of the access could be appropriate.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J32DS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Private Access (J33)

An aerial overview of the Private Access junction (J33) is provided in **Figure 2-53**.

Figure 2-53 *Private Access Junction (J33)*

Do Something (J33DS(a))

As this junction serves as a private access to a dwelling, there is no current alternative route to the highway network from the site, with the only access provided direct from the A40. It should be noted that no cross-carriageway manoeuvres are possible in this location at present.

With this in mind, combined with the estimated low traffic demand, it is considered that a **full closure and relocation of access** to the road that serves the Coast-to-Coast Caravans junction (J36) could be appropriate. This would require the construction of an approximately 200m length private access road, with ownership and management of the new route to be agreed with the appropriate landowner(s).

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J33DS(a)	With GS Scheme at Meidrim
• Full closure; • Relocation of access.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Waunbricks (J34)

An aerial overview of the Waunbricks junction (J34) is provided in **Figure 2-54**.

Figure 2-54 *Waunbricks Junction (J34)*

Do Something (J34DS(a))

Although a low traffic demand has been recorded at this junction and there is an alternative route to the surrounding highway network from the minor road, it is noted that a low bridge is located approximately 720m to the north of the A40. With this in mind, it is noted that if a full closure was to be implemented, larger vehicles would be unable to access the small number of dwellings and farms located between the A40 and the low bridge, and therefore a full closure of the junction is not considered to be appropriate.

This being said it is noted the diversion length for right-turn movements into the minor arm is approximately three minutes, which is considered as potentially acceptable to facilitate a restriction of the manoeuvre. Although the diversion length along the A40 for right-turn out movements is significant (approximately 13 minutes), it is noted that there is an alternative route available for most vehicles along Station Hill and Station Road to the St Clears Roundabout (J40). On this basis, combined with no vehicles recorded making this movement, it is considered that a restriction of the right-turn movement could also be appropriate. Therefore, the Do Something option includes a **closure of the central reservation** at this junction.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J34DS(a)	With GS Scheme at Meidrim
• Do Minimum improvements; • Closure of the central reservation.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Agricultural Access (J35)

An aerial overview of the Agricultural Access junction (J35) is provided in **Figure 2-55**.

Figure 2-55 *Agricultural Access Junction (J35)*

Do Something (J35DS(a))

Based on the nature of this junction as an agricultural access to adjoining fields, it has been estimated that the traffic demand is limited in this location. This being said, aerial imagery suggests that this access is currently utilised on occasions due to the presence of tyre tracks.

This being said, it is noted in paragraph 3.9 of CD 169 that junctions and accesses shall not be located within laybys, and therefore a **full closure** of the junction is proposed as part of this option.

As the access to the adjacent field is currently unused and overgrown, it is considered that a **full closure** of that access could be appropriate.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J35DS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Coast to Coast Caravans (J36)

An aerial overview of the Coast to Coast Caravans junction (J36) is provided in **Figure 2-56**.

Figure 2-56 *Coast to Coast Caravans Junction (J36)*

Do Something

It is noted that this junction currently only permits minor arm manoeuvres to and from the west. As it is estimated that restricting movements to and/or from the east could increase journey times significantly by approximately 14 minutes (noting the nearest safe u-turning facility is the Travellers Rest Junction (J5)), it is not considered that any additional amendments above what is proposed as part of J36DMin is appropriate in this location.

On this basis, there is **no Do Something option** proposed at this junction.

Existing Situation	With GS Scheme at Meidrim
• No Do Something Option.	• No Do Something Option.

Do More

Although a moderate traffic demand is estimated at this junction, the demand does not currently exceed the parameters set out in CD 123 and therefore it is not considered that merge and/or diverge lanes are required in this location.

This being said, it is considered that traffic demand should be monitored at this junction, with the potential requirement for a merge and/or diverge lane being dependent on future traffic flows.

Pentre Road Slip (J37)

An aerial overview of the Pentre Road Slip junction (J37) is provided in **Figure 2-57**.

Figure 2-57 *Pentre Road Slip Junction (J37)*

Do Something

As there are currently no cross-carriageway manoeuvres possible at this junction and there is a moderate traffic demand, **no Do Something option**, above the amendments suggested as part of the J37DMin option, has been proposed for further consideration in this location.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation	With GS Scheme at Meidrim
• No Do Something Option.	• No Do Something Option.

Do More

Based on the estimated traffic demand at the junction, it is considered that a diverge lane is required in this location, in line with CD 123.

This being said, as there is currently a diverge lane provided at this junction, no Do More option is proposed for further consideration in this location.

Agricultural Access (J38)

An aerial overview of the Agricultural Access junction (J38) is provided in **Figure 2-58**.

Figure 2-58 *Agricultural Access Junction (J38)*

<u>Do Something (J38DS(a))</u>

Based on the nature of this junction as an agricultural access to adjoining fields, it has been estimated that the traffic demand is limited in this location. This being said, it is noted that there is a paved access to the gate and therefore it is likely to currently be utilised.

This being said, it is noted in paragraph 3.9 of CD 169 that junctions and accesses shall not be located within laybys, and therefore a **full closure** of the junction is proposed as part of this option.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J38DS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Agricultural Access (J39a)

An aerial overview of the Agricultural Access junction (J39a) is provided in **Figure 2-59**.

Figure 2-59 *Agricultural Access Junction (J39a)*

Do Something (J39aDS(a))

Based on the nature of this junction as an agricultural access to adjoining fields, it has been estimated that the traffic demand is limited in this location.

Although it appears from aerial imagery that the access may still be in use, it is considered that a **full closure** could be appropriate due to the inappropriate access arrangement direct from the trunk road.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J39aDS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

Agricultural Access (J39b)

An aerial overview of the Agricultural Access junction (J39b) is provided in **Figure 2-60**.

Figure 2-60 *Agricultural Junction (J39b)*

Do Something (J39bDS(a))

Based on the nature of this junction as an agricultural access to adjoining fields, it has been estimated that the traffic demand is limited in this location.

Although the access is currently paved and therefore may still be in use, it is considered that a **full closure** could be appropriate due to the inappropriate access arrangement direct from the trunk road.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J39bDS(a)	With GS Scheme at Meidrim
• Full closure.	• No Do Something option.

Do More

The estimated traffic demand is low at this junction and therefore it is not considered that merge and/or diverge lanes are required in this location, based on the parameters set out in CD 123.

High Street Slips (J40)

An aerial overview of the High Street Slips junction (J40) is provided in **Figure 2-61**.

Figure 2-61 *High Street Slips Junction (J40)*

<u>Do Something (J40DS(a))</u>

As this junction is currently a grade-separated interchange, it is not considered that significant changes are possible. This being said, it is considered that there is a potential to improve the layout of the westbound off-slip through **amendments to the priority junction with the A4066 (High Street)**.

It is not considered that the introduction of a grade-separated junction at Meidrim (J14) would present an opportunity for an additional Do Something option at this junction.

Existing Situation – J40DS(a)	With GS Scheme at Meidrim
• Do Minimum improvements; • Amendments to westbound off-slip priority junction.	• No Do Something option.

Summary of Options

A summary of the amendments to junctions options for further assessment is provided in **Table 2-18**.

Junction		Existing Situation			With Grade-Separated Scheme at Meidrim	
		Do Minimum	Do Something	Do More	Do Something	Do More
J5	Travellers Rest	**J5DMin** Improvements to existing geometries.	*N/A*	*N/A*	*N/A*	*N/A*
J6	Market Hall Vets	**J6DMin** Improvements to existing geometries.	**J6DS(a)** Full closure; Relocation of access.	*N/A*	*N/A*	*N/A*
J7	Private Access	**J7DMin** Improvements to existing geometries.	**J7DS(a)** Full closure; Relocation of access.	*N/A*	*N/A*	*N/A*
J8	Western Power	**J8DMin** Improvements to existing geometries.	**J8DS(a)** J8DMin improvements; Restriction of right-turn out movement; Restriction of u-turn manoeuvres.	*N/A*	**J8DS(b)** J8DMin improvements; Closure of the central reservation.	*N/A*
J9	Private Access	**J9DMin** Improvements to existing geometries.	**J9DS(a)** J9DMin improvements; Restriction of right-turn out movement; Restriction of u-turn manoeuvres.	*N/A*	**J9DS(b)** J9DMin improvements; Closure of the central reservation.	*N/A*
J10	Carmarthen Showground	**J10DMin** Improvements to existing geometries.	*N/A*	*N/A*	*N/A*	*N/A*
J11	Ffoshelig Coaches / Agricultural Access	**J11DMin** Improvements to existing geometries.	**J11DS(a)** J11DMin improvements (Ffoshelig Coaches arm); Restriction of right-turn out movement (Ffoshelig Coaches arm); Full closure (Agricultural Access arm); Restriction of westbound u-turn manoeuvres.	*N/A*	**J11DS(b)** J11DMin improvements (Ffoshelig Coaches arm); Closure of the central reservation; Full closure (Agricultural Access arm).	*N/A*
J12	Tenby Road Filling Station	**J12DMin** Improvements to existing geometries.	*N/A*	**J12DMo(a)** J12DMin improvements; Introduction of eastbound merge lane.	*N/A*	*N/A*
J13	Golf Club / Private Access	**J13DMin** Improvements to existing geometries.	**J13DS(a)** J13DMin improvements; Restriction of right-turn out movement (Golf Club arm); Restriction of right-turn in movement (Private Access arm); Restriction of u-turn manoeuvres.	*N/A*	**J13DS(b)** J13DMin improvements; Closure of the central reservation.	*N/A*
J14	Meidrim	**J14DMin** Improvements to existing geometries.	**J14DS(a(i))** J14DMin improvements; Restriction of right-turn out movement; Restriction of left-turn in movement; Restriction of westbound u-turn manoeuvres. **J14DS(a(ii))** J14DMin improvements; Restriction of right-turn out movement; Restriction of westbound u-turn manoeuvres.	**J14DMo(a(i))** J14DS(a(i)) improvements; Introduction of eastbound merge lane. **J14DMo(a(ii))** J14DS(a(ii)) improvements; Introduction of eastbound merge lane.	*N/A*	**J14DMo(b)** Compact grade-separated junction.
J15	Agricultural Accesses	**J15DMin** Improvements to existing geometries.	**J15DS(a)** Full closure.	*N/A*	*N/A*	*N/A*

Junction		Existing Situation			With Grade-Separated Scheme at Meidrim	
		Do Minimum	Do Something	Do More	Do Something	Do More
J16	Private Access / Bragty	**J16DMin** Improvements to existing geometries.	**J16DS(a)** J16DMin improvements (Bragty arm); Restriction of right-turn in movement (Bragty arm); Full closure (Private Access arm).	*N/A*	*N/A*	*N/A*
J17	Agricultural Accesses	**J17DMin** Improvements to existing geometries.	**J17DS(a)** Full closure.	*N/A*	*N/A*	*N/A*
J18	Private Access / Llangynog	**J18DMin** Improvements to existing geometries.	**J18DS(a)** J18DMin improvements (Llangynog arm); Full closure (Private Access arm); Restriction of eastbound u-turn manoeuvres.	*N/A*	**J18DS(b)** J18DS(a) improvements; Restriction of right-turn in movement (Llangynog arm).	*N/A*
J19	Bancyfelin	**J19DMin** Improvements to existing geometries.	**J19DS(a(i))** J19DMin improvements; Restriction of westbound u-turn manoeuvres. **J19DS(a(ii))** J19DMin improvements; Restriction of right-turn in movement; Restriction of westbound u-turn manoeuvres.	*N/A*	**J19DS(b)** J19DMin improvements; Closure of the central reservation; Restriction of left-turn out movement.	*N/A*
J20	Private Access	**J20DMin** Improvements to existing geometries.	**J20DS(a)** Full closure; Relocation of access.	*N/A*	*N/A*	*N/A*
J21	Private Access	**J21DMin** Improvements to existing geometries.	**J21DS(a)** J21DMin improvements; Restriction of left-turn in movement; Restriction of left-turn out movement; Restriction of right-turn out movement.	*N/A*	**J21DS(b)** Full closure.	*N/A*
J22	Private Access	**J22DMin** Improvements to existing geometries.	**J22DS(a)** J22DMin improvements; Restriction of right-turn out movement.	*N/A*	**J22DS(b)** J22DMin improvements; Closure of the central reservation.	*N/A*
J23	Private Access / Agricultural Access	**J23DMin** Improvements to existing geometries.	**J23DS(a)** Full closure; Relocation of access (Private Access arm).	*N/A*	*N/A*	*N/A*
J24	CLH Storage	**J24DMin** Improvements to existing geometries.	**J24DS(a)** J24DMin improvements; Restriction of right-turn in movement.	*N/A*	**J24DS(b)** J24DMin improvements; Closure of the central reservation.	*N/A*
J25	Private Access	**J25DMin** Improvements to existing geometries.	*N/A*	*N/A*	*N/A*	*N/A*
J26	Bryn-y-Gaer / Private Access	**J26DMin** Improvements to existing geometries.	**J26DS(a)** J26DMin improvements; Restriction of right-turn in movement (Bron-y-Gaer arm); Restriction of right-turn out movement (Private Access arm).	*N/A*	**J26DS(b)** J26DMin improvements; Closure of the central reservation.	*N/A*
J27a	Private Access	**J27aDMin** Improvements to existing geometries.	**J27aDS(a)** Full closure; Relocation of access.	*N/A*	*N/A*	*N/A*

Junction		Existing Situation			With Grade-Separated Scheme at Meidrim	
		Do Minimum	Do Something	Do More	Do Something	Do More
J27b	Agricultural Access	**J27bDMin** Improvements to existing geometries.	**J27bDS(a)** Full closure.	*N/A*	*N/A*	*N/A*
J28	Private Access / Eglwys Llanfihangel Abercowin	**J28DMin** Improvements to existing geometries.	**J28DS(a)** J28DMin improvements; Restriction of right-turn in movement (Private Access arm); Restriction of right-turn out movement (Eglwys Llanfihangel Abercowin arm).	*N/A*	**J28DS(b)** J28DMin improvements; Restriction of right-turn in movement (Private Access arm); Restriction of right-turn out movement (Private Access arm); Restriction of right-turn out movement (Eglwys Llanfihangel Abercowin arm).	*N/A*
J29a	Private Access	**J29aDMin** Improvements to existing geometries.	**J29aDS(a)** Full closure; Relocation of access.	*N/A*	*N/A*	*N/A*
J29b	Forge Restaurant, Lodge and Filling Station	**J29bDMin** Improvements to existing geometries.	**J29bDS(a)** J29bDMin improvements; Rationalisation of site layout; Restriction to ad-hoc parking arrangements.	**J29bDMo(a)** Rationalisation of site layout; Introduction of westbound merge lane; Introduction of westbound diverge lane.	*N/A*	*N/A*
J30	Agricultural Access	**J30DMin** Improvements to existing geometries.	**J30DS(a)** Full closure.	*N/A*	*N/A*	*N/A*
J31	Private Access	**J31DMin** Improvements to existing geometries.	**J31DS(a)** Full closure; Relocation of access.	*N/A*	*N/A*	*N/A*
J32	Agricultural Access	**J32DMin** Improvements to existing geometries.	**J32DS(a)** Full closure.	*N/A*	*N/A*	*N/A*
J33	Private Access	**J33DMin** Improvements to existing geometries.	**J33DS(a)** Full closure; Relocation of access.	*N/A*	*N/A*	*N/A*
J34	Waunbricks	**J34DMin** Improvements to existing geometries.	**J34DS(a)** J34DMin improvements; Closure of the central reservation.	*N/A*	*N/A*	*N/A*
J35	Agricultural Access	**J35DMin** Improvements to existing geometries.	**J35DS(a)** Full closure.	*N/A*	*N/A*	*N/A*
J36	Coast to Coast Caravans	**J36DMin** Improvements to existing geometries.	*N/A*	*N/A*	*N/A*	*N/A*
J37	Pentre Road Slip	**J37DMin** Improvements to existing geometries.	*N/A*	*N/A*	*N/A*	*N/A*
J38	Agricultural Access	**J38DMin** Improvements to existing geometries.	**J38DS(a)** Full closure.	*N/A*	*N/A*	*N/A*
J39a	Agricultural Access	**J39aDMin** Improvements to existing geometries.	**J39aDS(a)** Full closure.	*N/A*	*N/A*	*N/A*
J39b	Agricultural Access	**J39bDMin** Improvements to existing geometries.	**J39bDS(a)** Full closure.	*N/A*	*N/A*	*N/A*

Junction		Existing Situation			With Grade-Separated Scheme at Meidrim	
		Do Minimum	**Do Something**	**Do More**	**Do Something**	**Do More**
J40	High Street Slips	**J40DMin** Improvements to existing geometries.	**J40DS(a)** J40DMin improvements; Amendments to westbound off-slip priority junction.	*N/A*	*N/A*	*N/A*
J41	St Clears Roundabout	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

Table 2-18 *Summary of Amendments to Junctions Options (VI4, VI5 & VI6)*

Amendments to Laybys (VI8)

It has been identified that the majority of the existing laybys within the scheme area are not in line with current standards for construction of new facilities (TPR5), as set out within DMRB CD 169[27]. The locations of laybys within the scheme area have previously been illustrated in Figure 2-10.

The majority of the laybys within the scheme area are Type B facilities, which do not include a physical segregation island and should only be located on single carriageway roads with speed limits of 40mph or under. It is set out within CD 169 that laybys on dual carriageway roads with a speed limit above 40mph should be Type A – with Merge Taper layouts, and therefore potential revised layby layouts have been developed in line with this.

The prescribed geometric layout for new laybys on the A40 within the scheme area, as set out in Figure 4.6Na within CD 169, is illustrated in **Figure 2-62**.

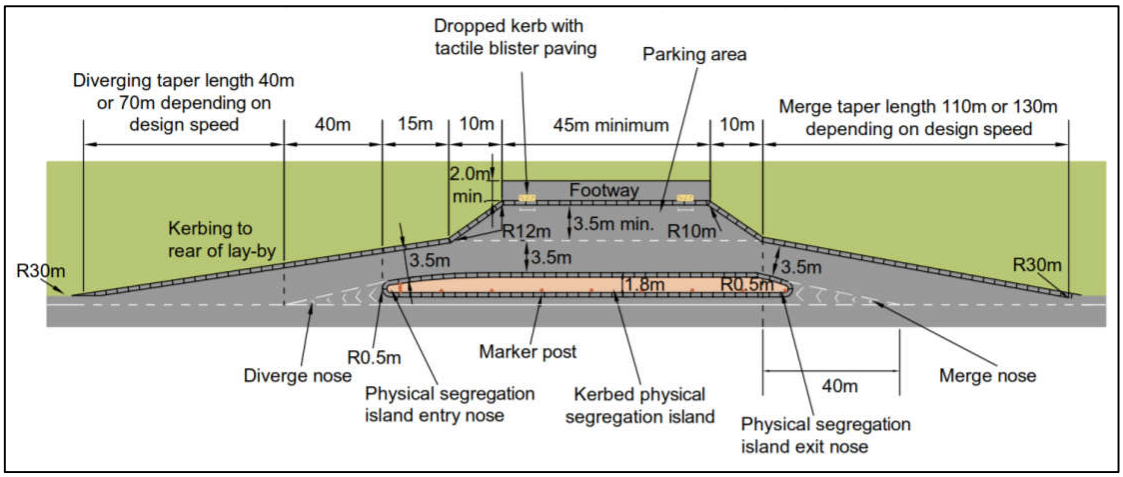


Figure 2-62 *Type A – with Merge Taper Geometric Layout*

Potential Closures

To inform the development of options at each of the laybys within the scheme area, as well as to identify facilities that could potentially be closed for the benefit of safety, a review of the existing provision in the context of CD 169 has been undertaken. This includes consideration of the siting of laybys and the required geometries, as well as the potential for third party land if a Type A – with Merge Taper layby was to be provided.

[27] Standards for Highways (2021) *CD 169 – The design of lay-bys, maintenance hardstandings, rest areas, service areas and observation platforms*. Available online: https://www.standardsforhighways.co.uk/dmrb/search/bd14af00-4671-42fd-9ce8-e996004b3518

Following on from the review of the existing provision, it is considered that there are three potential options at each of the laybys within the scheme area:

- No change to existing;
- Close layby; or
- Amend, and potentially relocate if required, existing layby in line with CD 169.

It should be noted that where a closure to a layby is proposed, it may be appropriate to retain use of the facility as an emergency stopping provision, in line with CD 169. It is considered that the potential retention of use of the laybys as emergency stopping provisions can be determined at WelTAG Stage Three, if required.

The full review of laybys is provided in the IAR.

Layby Option Packages

On the basis of the above, a number of layby amendment option packages have been developed for assessment as part of this WelTAG study, in addition to the Do Nothing scenario which includes no changes to the existing situation. The layby amendment packages are summarised as follows:

- **Do Minimum –** closure of relevant laybys and retention of remaining laybys as existing;
- **Do Something –** closure of relevant laybys and provision of amended facilities where appropriate; and
- **Do More –** provision of amended facilities at all laybys.

It should be noted that the majority of laybys maintained as part of the Do Minimum option package will not comply with CD 169, due to being a combination of Type B layouts and/or having non-compliant geometries. It is however acknowledged that CD 169 refers to the construction of new laybys and therefore the existing provision could remain open if considered appropriate.

In addition, it should be noted that the improvements developed for the laybys have considered upgrading the existing sites to be Type A – with Merge Taper layouts. This being said, it is considered that some laybys may need to be partially relocated to fully comply with standards, or a departure from standards will need to be agreed.

It is also considered that any changes to laybys WL1 and WL2 will be investigated as part of the A40 Carmarthen Western Gateway WelTAG Stage Two study, which will investigate improvements along the A40 to the east of the Travellers Rest junction (J5). The laybys have however been noted within this section as they make up part of the layby provision along the A40 corridor between Carmarthen and St Clears.

A summary of the Do Minimum, Do Something and Do More layby option packages is provided in **Table 2-19**.

Layby	Do Minimum	Do Something	Do More
		Eastbound	
EL1	Close layby.	Close layby.	Improve layby.
EL2	Close layby.	Close layby.	Improve layby.
EL3	Close layby.	Close layby.	Improve layby.
EL4	No change to existing.	Close layby.	Improve layby.
EL5	No change to existing.	Improve layby.	Improve layby.
EL6	No change to existing.	Improve layby.	Improve layby.
EL7	Close layby.	Close layby.	Improve layby.
EL8	Close layby.	Close layby.	Improve layby.
		Westbound	
WL1	*N/A*	*N/A*	*N/A*
WL2	*N/A*	*N/A*	*N/A*
WL3	Close layby.	Close layby.	Improve layby.
WL4	Close layby.	Close layby.	Improve layby.
WL5	No change to existing.	Improve layby.	Improve layby.
WL6	Close layby.	Close layby.	Improve layby.
WL7	Close layby.	Close layby.	Improve layby.
WL8	Close layby.	Close layby.	Improve layby.
WL9	Close layby.	Close layby.	Improve layby.
WL10	Close layby.	Close layby.	Improve layby.

Table 2-19 *Summary of Layby Option Packages*

Siting of Laybys

It is evident that the closure of laybys will reduce the number of laybys located within the scheme area in both directions. CD 169 recommends that non-emergency stopping provision is spaced 2.5km apart on all-purpose dual carriageways.

The following approximate distances have been recorded between the existing layby locations[28], as illustrated in **Figure 2-63**:

- **Eastbound:**
  - EL1 to EL2 – 0.6 km;
  - EL2 to EL3 – 0.9 km;
  - EL3 to EL4 – 1.8 km;
  - EL4 to EL5 – 0.5 km;
  - EL5 to EL6 – 1.2 km;
  - EL6 to EL7 – 1.2 km; and
  - EL7 to EL8 – 1.2 km.

[28] The distances between existing laybys will remain as part of the Do More option, due to the retention of all laybys with improved facilities.

- **Westbound:**
  - WL1 to WL2 – 0.6 km;
  - WL2 to WL3 – 1.2 km;
  - WL3 to WL4 – 3.2 km;
  - WL4 to WL5 – 1.3 km;
  - WL5 to WL6 – 0.6 km;
  - WL6 to WL7 – 1.1 km;
  - WL7 to WL8 – 1.2 km;
  - WL8 to WL9 – 0.7 km;
  - WL9 to WL10 – 0.9 km.

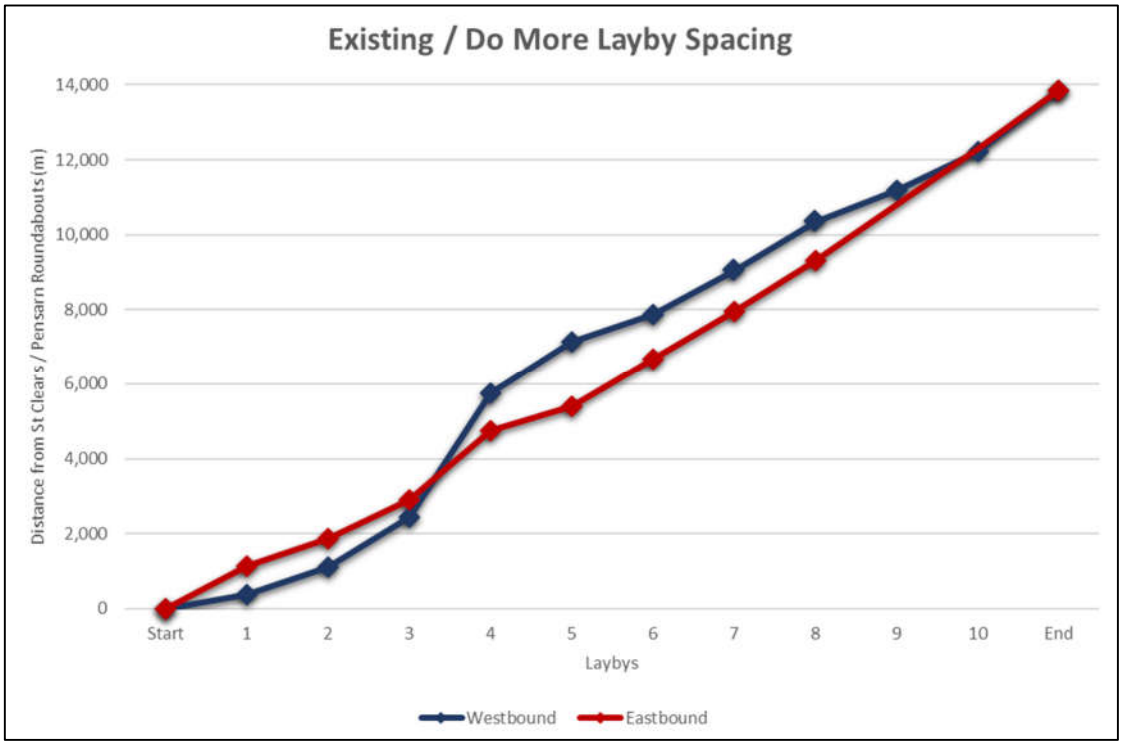


Figure 2-63 *Spacing of Laybys – Existing / Do More*

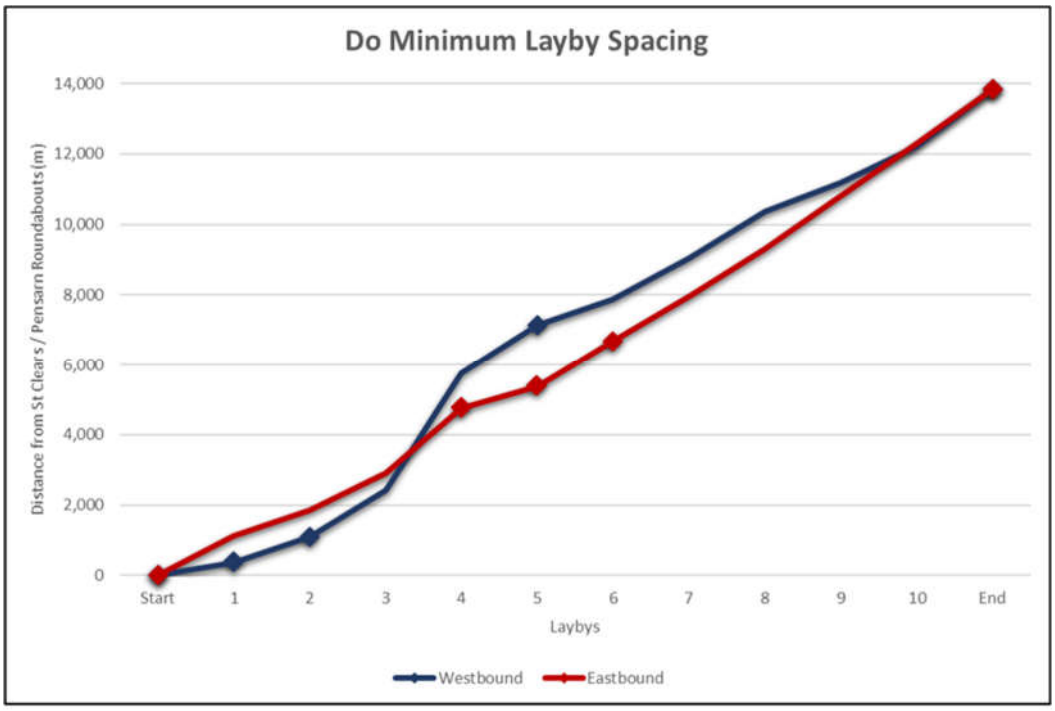
It is considered that the laybys are recorded relatively frequently along this section of the A40, with an average distance of approximately 1.7 km and 1.4 km between laybys across the corridor in an eastbound and westbound direction, respectively. It is therefore noted that across the corridor, the provision of laybys is above the guidelines set out within CD 169, although it is acknowledged there are some locations where the distance between laybys exceeds 2.5 km (such as between WL3 and WL4).

It is considered that the closure of laybys included within the Do Minimum and Do Something option packages increases journey distances between the laybys. The locations of the laybys retained as part of the Do Minimum and Do Something option packages are illustrated in **Figure 2-64**.

Figure 2-64 *Locations of Laybys – Do Minimum / Do Something*

The spacing of laybys within the Do Minimum and Do Something scenarios is significantly increased compared to existing, with the layby provision working out at approximately a layby every 4.6 km in both directions in the Do Minimum scenario, increasing to approximately every 6.9 km in an eastbound direction in the Do Something scenario. Although this is notably higher than the 2.5 km set out within CD 169, it is noted that 2.5 km is a recommended distance within the standards, as oppose to a compulsory figure, and therefore this increase in spacing may be considered acceptable.

The spacing of laybys in the Do Minimum and Do Something options is illustrated in **Figure 2-65**.



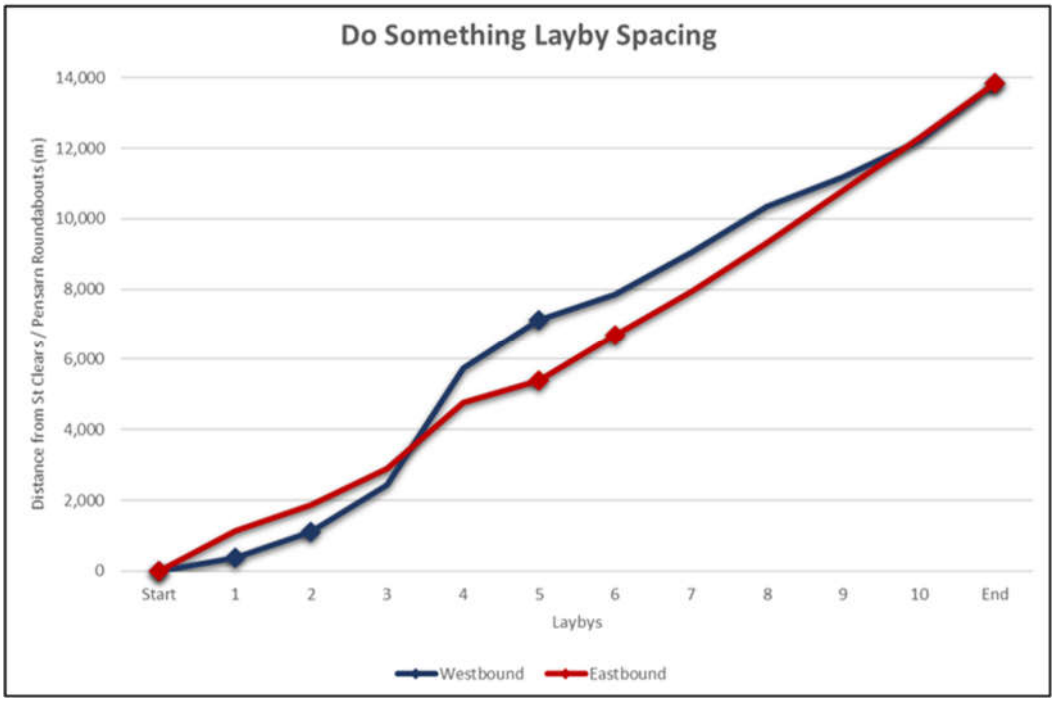


Figure 2-65 *Spacing of Laybys – Do Minimum / Do Something*

Improvements to High Street Slips (VI22)

This Option has been incorporated into the potential option developed as part of J40DS, included within VI4,5&6.

Signage – Agricultural Vehicle Warning Signs (VI27)

Chapter 4 of the Traffic Signs Manual[29] describes warning signs as ways to alert drivers to potential danger ahead, indicating a need for special caution by road users that may require a reduction in speed or some other manoeuvre (Section 1.6.2). Section 9.5.1 describes how animals and farm traffic signs can be used to give warning of farm tractors or other agricultural vehicles frequently travelling along a road at low speed, turn into or out of an entrance or cross a road. It is noted however, the Traffic Signs Manual describes that they should only be used where there is a specific safety issue or hazard.

Whilst it has been highlighted by stakeholders that farm traffic can result in a hazard in the area, no specific history of collisions associated with farm traffic has been identified. It is therefore considered that farm traffic warning signs should be considered as a supplementary measure at WelTAG Stage Three alongside the preferred solution package. **No further appraisal of VI27 is therefore included within this specific WelTAG Stage two.**

Street Lighting (VI29)

It has been noted that there is no consistent street lighting provision within the scheme area, which has been highlighted as a potential safety concern during stakeholder engagement across Stages One and Two. It is also noted that a fatal collision occurred within the vicinity of J11/J12 (Tenby Road Filling Station / Ffoshelig Coaches) during the hours of darkness, whereby the driver incorrectly interpreted access to the filling station.

It is considered that initial measures to improve safety along this route are being considered as part of Options VI4,5&6, which are looking at appropriate infrastructure changes that would seek to mitigate such instances as the fatality referred to above. However, it is acknowledged that additional lighting should be a further consideration. This is particularly pertinent given the active travel provision routed adjacent to the A40 to the east of Meidrim and measures being considered to the west of Meidrim. Active Travel Act guidance suggests that street lighting should generally be provided for cycle safety and comfort; therefore, it is recommended that a **detailed assessment of street lighting needs should be included as part of a WelTAG Stage Three.** This will include a lighting appraisal in line with current guidance to determine if the provision of road lighting is justified, with consideration of specific needs at the junctions and a route provision along the SUP(s).

On this basis, **no further consideration is given to street lighting as part of this WelTAG Stage Two**.

[29] Traffic Signs Manual (2018) *Chapter 4 – Warning Signs*. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/772037/traffic-signs-manual-chapter-4.pdf

Alternative and Diversion Routes (VI30)

It is considered that the focus of this study is on the A40 corridor itself, and that potential measures should be explored that minimises the need for use of alternative and / or diversion routes. Should there be a need for use of these routes then it is considered that a separate study can be progressed in collaboration with CCC, given that the most efficient routes are likely to be on the county road network.

On this basis, **it is not considered that improvements to the alternative diversion routes should be further investigated**, at this stage.

Hard Shoulder (VI31)

The WelTAG Stage One study identified that the provision of a hard shoulder along the length of the A40 within the scheme area could improve the resilience of the route, whilst also supporting access for emergency vehicles to the proposed new hospital to the west of St Clears.

An indicative cross-section of a hard shoulder on the A40 is presented in **Figure 2-66**.

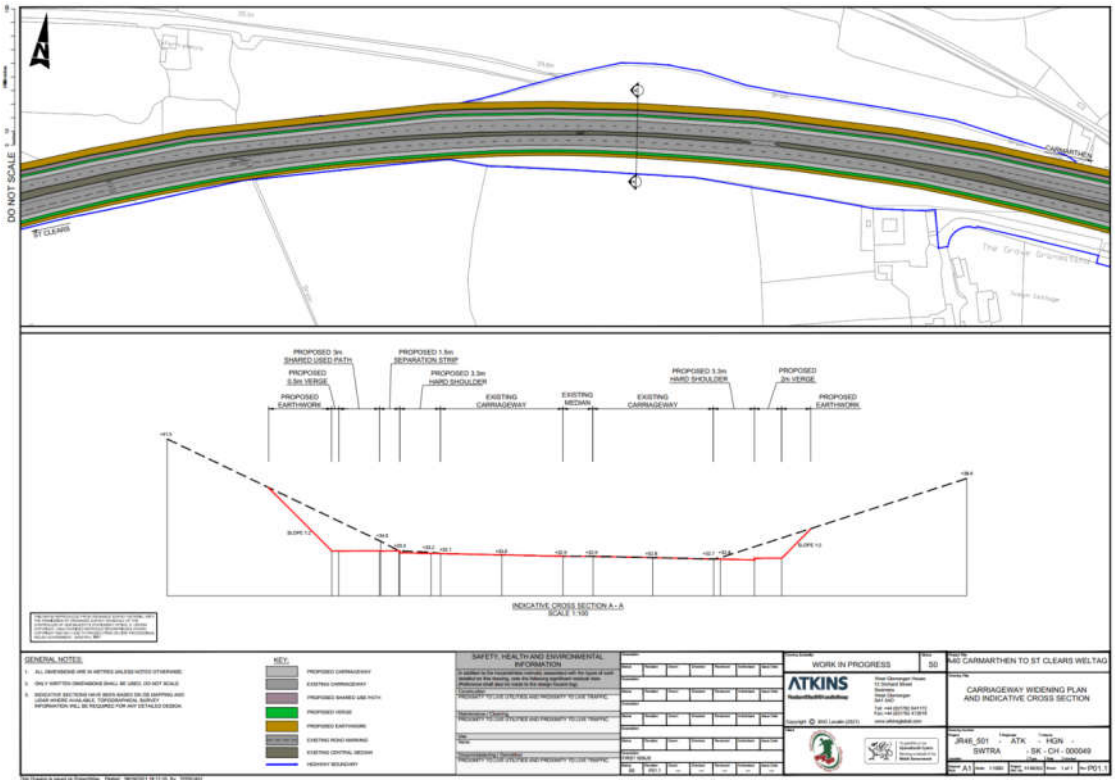


Figure 2-66 *Example of A40 Hard Shoulder*

Noise Mitigation (VI33)

Whilst it is acknowledged that there are a number of noise priority and proximity areas within the vicinity of the scheme area, noise has not been identified as a transport problem and therefore specific measures to reduce the noise produced by transport in the area has not been considered further at this stage. This being said, further consideration can be given to noise mitigation measures to be delivered alongside interventions that address the key transport problems in the area, at the next stage of the study.

2.8.5. Highway Technology

Overview

This Chapter describes the process undertaken to derive a list of interventions associated with the short list of options identified at WelTAG Stage One for highway technology. The interventions developed have subsequently been utilised in the assessment of options to identify a preferred package of solutions within the scheme area, as detailed in **Chapter 3**.

For reference, the highway technology short list options are summarised as follows:

- **SH1 –** Introduction of vehicle actuated warning signs;
- **SH3 –** Introduction of variable information boards; and
- **SH6 –** Introduction of autonomous vehicle infrastructure.

Vehicle Actuated Signs (SH1)

Sign Type

It was suggested as part of the WelTAG Stage One study that vehicle actuated (VA) warning signs could improve resilience and safety within the scheme area. The VA signs of potential relevance may be considered as:

- Signs warning of congestion ahead; and
- VA speed signs at specific locations within the scheme area.

Within the context of this Stage Twi study, it is considered that signs relating to congestion would only be relevant to the approach to Carmarthen (i.e. the Western Gateway) which is outside of this study area. Potential VA signs in specifically relating to congestion will therefore be considered in further detail as part of a separate WelTAG study covering that area.

Within the context of this WelTAG Stage Two study, specific consideration has been given to VA speed signs at specific locations within the scheme area.

Vehicle Actuated Signs and Speed Indicator Devices

It is acknowledged that there could be a link between vehicle speeds and collisions, with VA signs and speed indicator devices considered to be potential measures that can be used to address speeding issues.

The PAG 106/16 document[30] outlines the criteria for using VA signs and speed indicator devices on trunk roads in Wales; whilst it does not explicitly cover dual carriageways, it is considered an appropriate guide in terms of the process for evaluating the need for such measures in this instance. The process for considering whether a VA sign or speed indicator device is illustrated in Figure 1 within PAG 106/16 and replicated in **Figure 2-67**.

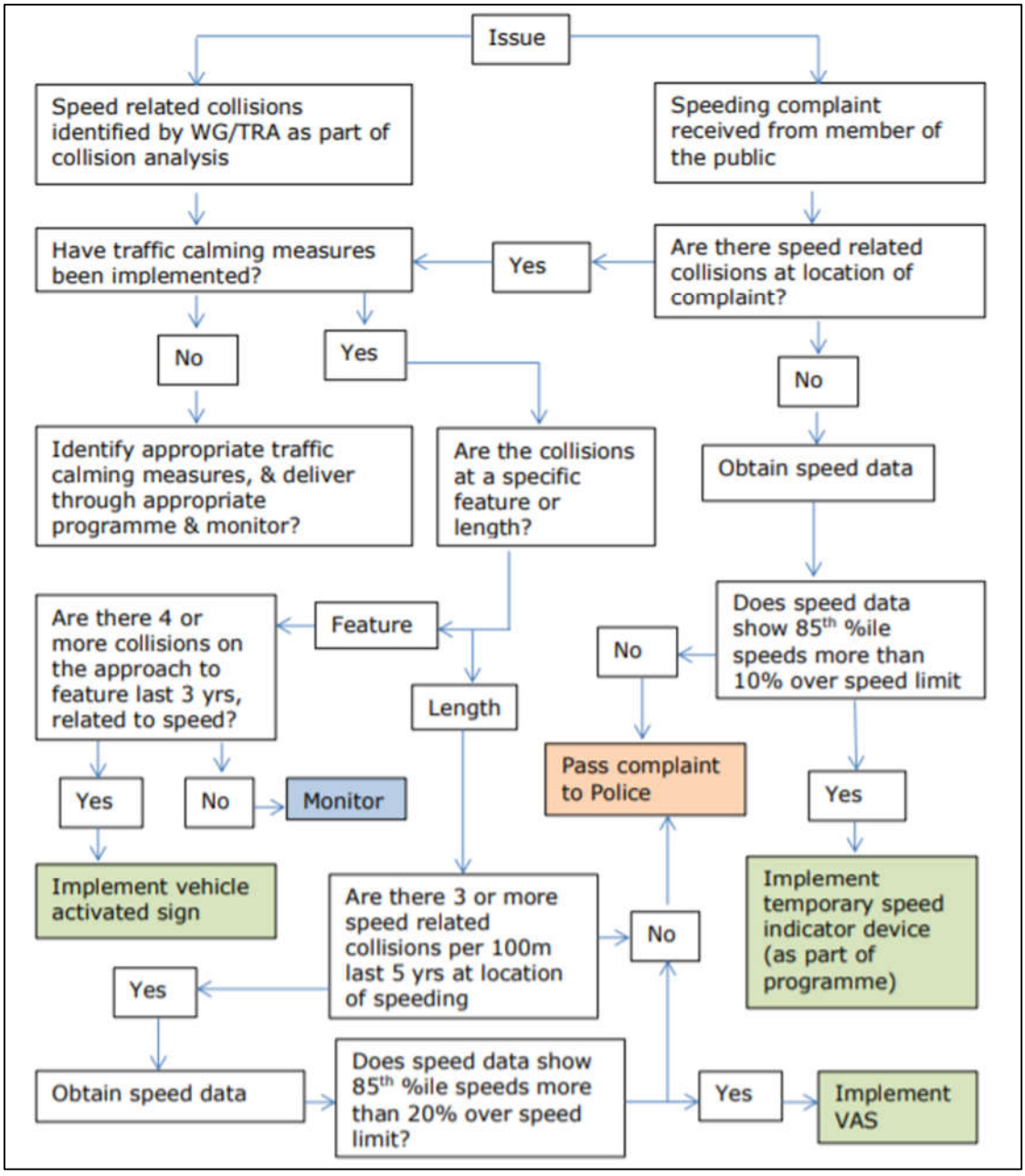


Figure 2-67 *Vehicle Actuated Signs and Speed Indicator Devices Decision Process*

[30] Welsh Government (2015) *PAG 106/16: vehicle activated signs and speed indicators on trunk roads*. Available online: https://gov.wales/procedure-and-advice-guidance-pag-10616-vehicle-activated-signs-and-speed-indicators-trunk-roads

The WelTAG Stage One study identified a notable rate of collisions within the scheme area, with speed being a potential factor in some of them. However, with reference to the flow diagram presented in **Figure 2-67** it is not considered that traffic calming measures have been implemented within the scheme area and therefore the introduction of VA signs or speed indicator devices are unlikely to be required at this stage.

Instead, the process chart suggests that consideration should be given to appropriate traffic calming measures should be identified. This WelTAG Stage Two study is reviewing appropriate traffic calming measures including speed limit changes and junction safety improvements.

Consideration has also given to the criteria referenced within the guidance, for use of VA signs and speed indicators. It suggests that, in relation to VA warning signs, two elements should be met:

- A history of three or more speed related collisions in five years in 100m; and
- Speed data must show recorded 85th percentile speeds at 20% over the speed limit.

With regards to speed indicators, it suggests that

- There must be a record of complaints regarding speeding either received by Welsh Government or the police; and
- 85th percentile speeds recorded at more than 10% over the speed limit.

A review of typical traffic speeds indicates that the 85th percentile is below the current speed limit, and on this basis, it is considered **that VA signs and/or speed indicator devices are not required at this stage**. Further consideration of other measures (such as changes to junction layouts) are being considered in more detail within this WelTAG Stage Two, and it is recommended that the preferred solution(s) will be monitored, with further consideration given to VA signs and /or speed indicator devices post implementation if required.

Variable Information Boards (SH3)

Variable information boards, or variable message signs (VMS), are traffic signs which convey a message to traffic on roads depending on the current traffic, environmental or other conditions. According to the Traffic Advisory Leaflet (TAL) 01/15[31], VMS can be used to portray a sign prescribed by the Traffic Signs Regulations and General Directions (TSRGD) guidance, a legend in accordance with Schedule 15 of TSRGD, a non-prescribed temporary sign or a blank grey / black face.

[31] Traffic Advisory Leaflet 01/15 (2015) *Variable Message Signs*. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/397832/150123_TAL_Variable_Message_Signs__for_web_publication_.pdf

Within the scheme area, it was considered at WelTAG Stage One that a VMS could be useful to portray messages relating to any of the following:

- Congestion at Pont Lesneven and/or the St Clears Roundabout (J41), particularly warning drivers of queues ahead to reduce the potential for rear-shunt collisions;
- Congestion and/or availability of parking within Carmarthen;
- Traffic conditions in the wider region, particularly on the A40 / A477 to the west and the A48 / M4 to the east. Drivers could be encouraged to utilise alternative routes if required;
- Adverse weather conditions;
- Road safety prompts, including messages warning drivers to not drink and drive;
- Upcoming events in the surrounding area allowing drivers to plan ahead; and
- Marketing messages for other forms of travel such as bus and rail. For example, messages could highlight regional rail stations (Carmarthen) as alternative travel options.

It is not considered likely that there would be a significant impact from this option, however it could enhance the perception of the corridor as a whole. It is considered that a detailed review of this option should be informed by further stakeholder engagement at Stage Three, **however no further assessment is undertaken at this stage**. It is recommended that this option could be **retained for further assessment at WelTAG Stage Three** as a supplementary measure to any preferred option package.

Autonomous Vehicle Infrastructure (SH6)

It was identified at WelTAG Stage One that the provision of autonomous vehicle infrastructure within the scheme area could reduce carbon emissions and reduce the potential for collisions through removing human error, which contributes to 85% of collisions on UK roads[32]. In addition, it is noted within the well-being ambitions of the WTS that by 2040 new technology and/or automated vehicles will be commonly used on roads in Wales.

Whilst it is acknowledged that the retrofitting of existing infrastructure to support the shift to autonomous vehicles could support the ambition of the WTS, there is currently limited guidance as to the appropriate provision to support this shift, with the majority of current autonomous vehicles fitted with automated lane keeping system technology which utilises the existing lane allocation provision on UK roads.

[32] UK Government (2021) *Government paves the way for self-driving vehicles on UK roads.* Available online: https://www.gov.uk/government/news/government-paves-the-way-for-self-driving-vehicles-on-uk-roads

On this basis, **it is not considered that the introduction of autonomous vehicle infrastructure should be further assessed**, at this stage. It is however noted that any solutions developed within the scheme area will be developed in line with national guidance, which should support the retrofitting of existing infrastructure for autonomous vehicles in the future, if required.

2.9. Key Risks, Constraints, and Interdependencies

WelTAG recommends a summary of the key risks, constraints and interdependencies associated with short-list of options should be presented.

A summary of the. key risks and constraints associated with each of the short-list options is provided in **Table 2-20**, with no interdependencies identified at this stage. It should be noted that the risks and constraints are considered to be largely comparable between the four options, although it is noted that the risks are likely to be slightly higher for the Do More options, due to the inclusion of an additional link road.

Ref.	Category	Headline	Description	Potential Mitigation
R01	Risk	Habitats	There is the potential for protected species, such as bats, great crested newts or hazel dormouse, to be present in the area.	A programme of surveys is proposed to identify why there are any species of note.
R02	Risk	Listed Buildings	There are two listed buildings located within the scheme area, that may impact on measures developed in detail at Stage Three	The impact of the preferred options package will be assessed in detail at the next stage, with appropriate mitigation to be identified where necessary.
R03	Risk	Residential Receptors	There are residential receptors present within the scheme area which could be impacted by changes to traffic flows.	The air quality and noise impact of the preferred options package will be assessed in detail at the next stage, with appropriate mitigation to be identified.
R04	Risk	Archaeological Remains	There is a potential that unknown archaeological remains could be present within the scheme area.	Ground investigation of the preferred options package will be assessed in detail at the next stage, with appropriate mitigation to be identified.
R05	Risk	Surface Water Run-Off	An increase in impermeable surfaces will increase surface run-off, leading to potential additional flood risk.	Consideration of flood risk and appropriate drainage will be undertaken at the next stage.
R06	Risk	Groundwater	There is a potential that earthworks could impact on bedrock aquifers, whilst increased surface water run-off could also impact groundwater.	Consideration of flood risk and appropriate drainage will be undertaken at the next stage.
R7	Risk	Stakeholder Objection	There is a potential that stakeholders could object to the potential solutions, which may pose deliverability challenges in any Orders applications.	Early engagement has been made with relevant key stakeholders to reduce the potential for objections at a later date, with public consultation to be carried out at the next stage.
R8	Risk	Poor Value for Money	Due to the relatively low traffic flow at the minor arms of the junctions, and minimal opportunity to achieve active travel benefits within this works package, it may be difficult for the preferred options package to obtain a good value for money.	Consideration of the potential value for money of the preferred solution will be investigated at the next stage, with relevant wider benefits identified in the absence of a good value for money option.
R9	Risk	Utilities	Due to the corridor nature of the study no search of utilities has been undertaken at this stage.	Utilities searches will be undertaken as part of the detailed design at the next stage; appropriate engagement will be undertaken with utilities companies as appropriate.
C01	Constraint	Third-Party Land	Some options may require third-party land.	Early engagement will be made with the relevant landowners to explain the scheme and seek their views on the scheme principles at the next stage.
I01	Interdependency	St Clears to Bancyfelin SUP	Whilst not explicitly interdependent, it will be important that the preferred package incorporates the detailed design of the SUP	Early engagement between design teams of the two design packages.

Table 2-20 *Short-List Options – Key Risks and Constraints*

3. Transport Case

3.1. Overview

The purpose of the Transport Case within this Stage Two report is to consider potential impacts of the potential options and identify a suitable preferred option package for further detailed consideration at Stage Three(s).

Due to the corridor nature of the study, a proportionate assessment has been undertaken on the options within each of the short-list themes, with reference to the analysis that informed the development of the options. This allows a recommendation to be made on a preferred option package or packages; noting that a full assessment of the preferred solution will be undertaken as part of detailed design, which will fully develop the business case for the scheme at WelTAG Stage Three.

It should be noted that this Transport Case has been informed by:

- GG142 (Walking, Cycling and Horse Riding) Review Report;
- Stakeholder engagement;
- Traffic data analysis;
- Relevant design guidance (DMRB);
- Welsh Government's guidance, including Guidelines for the submission of road safety schemes; and
- Reference to the Department for Transport (DfT) TAG guidance

3.1.1. Sifted Measures

In developing the options (Section 2.8), the options below are not included within the identification of a preferred package for further appraisal:

- Improvements to Existing Route Map (AT3) / Development of Integrated Network Map (AT4) – due to AT1 and AT2 including consideration of improvements on some of the CCC network, and wider improvements being recommended as part of a separate works package at Stage One;
- Improvements to Meidrim and Bancyfelin Junctions (PT3) – due to the measures being proposed as part of VI4,5&6;
- Speed Enforcement (VI3) – following a review of the scheme area against Welsh Government's guidance for speed enforcement, which suggests that speed enforcement cameras are not justified on the existing route at this stage;
- Alternative and Diversion Routes (VI30) – as improvements on the A48 should be investigated in the first instance to ensure the principal flow of traffic through the area remains on the trunk roads;
- Vehicle Actuated Signs (SH1) – in line with the PAG106/16 document, which suggests VA signs are not required at this stage within the scheme area; and
- Autonomous Vehicle Infrastructure (SH6) – due to the lack of national guidance on developing infrastructure for autonomous vehicles at this stage.

Whilst not considered relevant for further consideration at this stage, it should be noted that the options outlined above may be appropriate in the future.

3.1.2. Supplementary Measures

In addition to the above, it should be noted that there are other measures that have not been assessed or recommended as part of a preferred option at this stage, but could serve as supplementary measures to the preferred options package, such as:

- Removal of Legacy Signage (AT9);
- Traffic Regulation Order (AT11);
- Pedestrian Warning Signs (AT12);
- Agricultural Vehicle Warning Signs (VI27);
- Street Lighting (VI29);
- Noise Mitigation (VI33);
- Bus Vehicle Actuated Signs (PT4); and
- Variable Information Boards (SH3).

These options could be considered at WelTAG Stage Three as part of the detailed design of the preferred scheme, which will include relevant risk assessments and road safety audits.

3.2. Scope of Assessment

The assessment of the options has reviewed a range of criteria, in line with the three WelTAG appraisal areas of Environmental, Social and Cultural, and Economy. A summary of the scope of assessment is provided as follows[33].

Social and Cultural:

A proportionate qualitative assessment of the potential impacts on:

- Physical Activity;
- Security;
- Severance;
- Journey Quality;
- Option Values and Non-Use Values;
- Accessibility; and
- Personal Affordability.

[33] The metrics relating to the assessment parameters are set out within the accompanying IAR.

Environment:

A proportionate combination of qualitative and quantitative assessment of the potential impacts on:

- Noise;
- Air Quality;
- Greenhouse Gases;
- Landscape and Townscape; and
- Heritage and Historic Environment.

Economy:

- **Journey Time Changes –** a bespoke review of potential journey time changes has been undertaken to inform the consideration of the impact of journey time changes on the economy over a 60-year appraisal period.

  The following parameters have been utilised in the scoring of potential journey time benefits / disbenefits:

  - Neutral Impact – £0 to £100k;
  - Slight Impact – £100k to £5 million;
  - Moderate Impact – £5 million to £10 million; and
  - Large Impact – more than £10 million.

- **Journey Time Reliability –** a qualitative assessment which summarises the potential impact on journey time reliability through potential improvements to safety;
- **Collisions –** the potential costs associated with collisions has been considered and assessed in the context of potential savings associated with the options, based on a combination of the 'Guidelines for the Submission of Road Safety Schemes', Cobalt principles and observed collision rates.

  The following parameters have been utilised in the scoring of potential collision savings:

  - Neutral Impact - £0 to £100k;
  - Slight Impact – £100k to £5 million;
  - Moderate Impact – £5 million to £10 million; and
  - Large Impact – more than £10 million.

- **Land –** it is likely that some potential options require third party land take. For the purposes of a comparative analysis, the seven-point scale has been used to understand the potential impact of any land take required to accommodate a potential measure, with a larger impact reflected within the scoring. It should however be noted that the actual and magnitude of impact of the preferred solution will be determined as part of detailed design at the next stage.

- **Cost –** a summary of the estimated present value of costs (PVC) associated with each of the options. It should be noted that the estimated PVC associated with each of the measures are presented as part of the assessment of each option, and include optimism bias of 23%, in line with Table 8 of TAG unit A1-2[34].

  The following parameters have been utilised in the scoring of potential capital costs:

  - Slight Adverse – £0 to £1 million;
  - Moderate Adverse – £1 million to £5 million; and
  - Large Adverse – more than £5 million.

  It should be noted that further cost information is provided in **Chapter 4**.
- **Value for Money** – an indicative value for money statement has been derived based on the potential present value of benefits (PVB) and the PVC associated with the likely capital costs. The value for money statement is based on the parameters set out within the DfT's Value for Money Framework[35].

3.3. Active Travel

SUP and Cycleway Improvements (AT1) & Meidrim to Bancyfelin Active Travel Route (AT2)

As has been noted within the development of options in Section 2.8.2, there are a number of options recommended for progression to WelTAG Stage Three, including:

- SUP and Cycleway Improvements (AT1); and
- Meidrim to Bancyfelin Active Travel Route (AT2)

A summary of the option impact appraisal undertaken for Options AT1 and AT2, is provided in **Table 3-1**, with the estimated cost of the options, based on indicative alignments, summarised in **Table 3-2**.

[34] UK Government (2021) *TAG Unit A1-2 Scheme Costs*. Available online: https://www.gov.uk/government/publications/webtag-tag-unit-a1-2-scheme-costs-july-2017

[35] Department for Transport (2017) *Value for Money Framework*. Available online: https://www.gov.uk/government/publications/dft-value-for-money-framework

Assessment Criteria	AT1	AT2
Social and Cultural		
Physical Activity	+	+
Security	0	0
Severance	+	+
Journey Quality	+	+
Option Values and Non-Use Values	0	0
Accessibility	++	+ +
Personal Affordability	0	0
Environment		
Noise	-	-
Air Quality	-	-0
Greenhouse Gases	-	-0
Landscape and Townscape	0	0
Heritage and Historic Environment	0	0
Economy		
Journey Time Changes	0	0
Journey Time Reliability	0	0
Collisions	0	0
Land	0	0
Cost	--	- -
Value for Money	Poor	Poor

Table 3-1 *Appraisal Summary Table – Options AT1 and AT2*

Option	Investment Cost	Investment Cost (with Inflation)	Investment Cost (with Inflation, Risk & OB)	Present Value of Costs
AT1	£1,200,000	£1,400,000	£1,700,000	£1,000,000
AT2	£1,400,000	£1,500,000	£1,900,000	£1,100,000

Table 3-2 *Estimated Costs – Options AT1 and AT2*

Public Rights of Way and Crossing Opportunities (AT5, AT6 & AT7)

On the basis that there is an established safety concern with the existing crossings located within the scheme area, it is not considered that the Do Minimum option of maintaining the existing crossings in their existing state is suitable across the corridor.

A summary of the option impact appraisal undertaken for the PRoW and Crossing Opportunities (AT5/6/7) options is provided in **Table 3-3**, with the estimated cost of the options summarised in **Table 3-4**.

Assessment Criteria	AT5/6/7(a)	AT5/6/7(b)
Social and Cultural		
Physical Activity	+	+
Security	0	0
Severance	+	++
Journey Quality	+	+
Option Values and Non-Use Values	0	0
Accessibility	+	+ +
Personal Affordability	0	0
Environment		
Noise	0	0
Air Quality	0	0
Greenhouse Gases	0	0
Landscape and Townscape	0	-
Heritage and Historic Environment	0	0
Economy		
Journey Time Changes	0	0
Journey Time Reliability	0	0
Collisions	0	0
Land	0	0
Cost	-	- -
Value for Money	Poor	Poor

Table 3-3 *Appraisal Summary Table – Public Rights of Way and Crossing Opportunities (AT5/6/7)*

Option	Investment Cost	Investment Cost (with Inflation)	Investment Cost (with Inflation, Risk & OB)	Present Value of Costs
AT5/6/7(a)	£200,000	£300,000	£300,000	£200,000
AT5/6/7(b)	£1,400,000	£1,500,000	£1,900,000	£1,100,000

Table 3-4 *Estimated Costs – Public Rights of Way and Crossing Opportunities (AT5/6/7)*

The appraisal of the active travel options indicates that there will be benefits arising from both the AT5/6/7(a) and AT5/6/7(b) options, relating to improved accessibility for active travel users within the Social and Cultural criteria. Both options are considered to have the potential to contribute towards meeting two of the TPOs, in relation to Active Travel, with a view to minimising the safety for active travel users within the scheme area (TPO2) whilst minimising the impact on access (TPO3). The principle of providing active travel improvements is also considered important in aligning the study with the WTS.

However, due to the rural nature of the corridor and on the basis that they are not primary desire lines, it is not considered that there will be significant demand at either of the crossing points; do not connect densely populated areas and / or high trip attracting goods and services. Therefore, it is likely that both options would deliver a poor value for money.

It is considered that Table 12.1 in the Active Travel Act Guidance suggests that grade-separated crossings are most appropriate for the A40 road type, with at-grade crossings considered suitable for few people. However, consideration should be given to the existing function of the crossing points, and the type of user.

On this basis, it is considered that the preferred layout of the crossing point at PRoW 63/32 should be determined at WelTAG Stage Three and therefore both options should be taken forward.

In order to identify the preferred crossing layouts, surveys undertaken at the PRoW crossing, further engagement with stakeholders / public consultation, and consideration of the value for money should be undertaken at Stage Three. It is also recommended that a safety risk assessment is undertaken in line with DMRB guidance 'GG 104 Requirements for safety risk assessment' at Stage Three, to inform whether at-grade or grade-separated crossings are most appropriate. The safety risk assessment will include the following stages:

- Hazard identification;
- Hazard analysis;
- Analysis of safety risk;
- Evaluation of safety risk; and
- Safety risk mitigations.

3.4. Public Transport

3.4.1. Bus Stop Infrastructure and Active Travel Linkages (PT7 & AT8)

A summary of the option impact appraisal undertaken for the Bus Stop Infrastructure (PT7) options is provided in **Table 3-5**, with the estimated cost of the options summarised in **Table 3-6**.

Assessment Criteria	PT7DMin	PT7DS	PT7DMo
Social and Cultural			
Physical Activity	0	0	0
Security	0	0	0
Severance	0	0	+
Journey Quality	+	+	+
Option Values and Non-Use Values	0	0	0
Accessibility	0	0	+
Personal Affordability	0	0	0
Environment			
Noise	0	0	0
Air Quality	0	0	0
Greenhouse Gases	0	0	0
Landscape and Townscape	0	0	-
Heritage and Historic Environment	0	0	0
Economy			
Journey Time Changes	0	0	0
Journey Time Reliability	0	0	0
Collisions	0	0	0
Land	0	0	0
Cost	-	-	- - -
Value for Money	Poor	Poor	Poor

Table 3-5 *Appraisal Summary Table – Bus Stop Infrastructure (PT7)*

Option	Investment Cost	Investment Cost (with Inflation)	Investment Cost (with Inflation, Risk & OB)	Present Value of Costs
PT10DMin	£270,000	£300,000	£370,000	£220,000
PT10DS	£510,000	£560,000	£690,000	£420,000
PT10DMo	£1,700,000	£1,800,000	£2,300,000	£1,400,000

Table 3-6 *Estimated Costs – Bus Stop Infrastructure (PT7)*

It is considered that all options would provide an improvement to the existing bus layby provision, however it is not considered that the Do Minimum option (PT7DMin) is suitable, as it does not improve the existing crossing provision for pedestrians accessing the bus layby at St Clears and therefore poses a potential safety concern.

In addition to this, limited benefit to the environment would be expected as part of these options, due to the relatively minor improvements relating to bus layby provision and linkages. It is not considered that this is likely to facilitate a modal shift, due to the minor improvements, with the primary purpose of these options to improve safety for bus users.

This being said, it is considered that there would potentially be some benefit arising from the Do Something (PT7DS) and Do More (PT7DMo) options in relation to reducing an existing barrier for active travel users crossing the A40 in this location. It is considered that the Do More option provides larger benefits relating to this, due to the reduction in severance through the provision of a grade-separated crossing. It is however noted that the value for money of both options is likely to be poor due to the rural nature of the area and subsequent limited level of demand.

Whilst this may be the case, public transport infrastructure improvements in the scheme area are aligned with the priorities set out within the WTS.

With this in mind, it is considered that both the PT7DS and PT7DMo options are appropriate for further consideration at Stage Three. As referred to within the improvements to the PRoW crossing opportunity (AT5/6/7), it is considered that further review is required to determine the preferred crossing type that should be delivered in this location.

It is recommended that further assessment of the specific crossing type is undertaken at Stage Three, with reference to a GG104 risk assessment, bus user surveys and public consultation.

3.5. Vehicle Infrastructure

3.5.1. Speed Limit Changes (VI1)

A summary of the option impact appraisal undertaken for the Speed Limit Changes (VI1) options is provided in **Table 3-7**, with the estimated cost of the options summarised in **Table 3-8**.

Assessment Criteria	VI1(a)	VI1(b)	VI1(c)	VI1(d)	VI1(e)
Social and Cultural					
Physical Activity	0	0	0	0	0
Security	0	0	0	0	0
Severance	0	0	0	0	0
Journey Quality	- -	-	-	-	-
Option Values and Non-Use Values	0	0	0	0	0
Accessibility	0	0	0	0	0
Personal Affordability	+	+	+	+	+
Environment					
Noise	0	0	0	0	0
Air Quality	+	+	+	+	+
Greenhouse Gases	+ +	+	+	+	+
Landscape and Townscape	0	0	0	0	0
Heritage and Historic Environment	0	0	0	0	0
Economy					
Journey Time Changes	- - -	- - -	- - -	- - -	-
Journey Time Reliability	+	+	+	+	+
Collisions	+ +	+ +	+ +	+	+
Land	0	0	0	0	0
Cost	-	-	-	-	-
Value for Money	Poor	Poor	Poor	Poor	High

Table 3-7 *Appraisal Summary Table – Speed Limit Changes (VI1)*

Option	Investment Cost	Investment Cost (with Inflation)	Investment Cost (with Inflation, Risk & OB)	Present Value of Costs
VI1DS(a)	£49,000	£54,000	£67,000	£40,000
VI1DS(b)	£29,000	£32,000	£40,000	£24,000
VI1DS(c)	£29,000	£32,000	£40,000	£24,000
VI1DS(d)	£27,000	£30,000	£37,000	£22,000
VIDS(e)	£20,000	£22,000	£27,000	£16,000

Table 3-8 *Estimated Costs – Speed Limit Changes (VI1)*

The analysis of the impact of speed limit changes on Air Quality and Greenhouse Gas Emissions indicates that there would be some benefit within the corridor due to the reduction in speed. However, it is pertinent to note that there are no AQMAs or Pollution Climate Mapping (PCM) links in exceedance of the limit value within 200m of the A40. Given the rural location along the A40 there are few human health receptors and no current air quality issue at this location.

To inform the assessment of the option, consideration has been given to the impact of the speed limit change on the journey times through the corridor, and subsequent dis-benefits to the local economy. For much of the corridor, the disbenefit of reducing the speed limit is far greater than the benefits to Air Quality, and it is considered that there would be an impact on journey quality given the nature of the road. As there would be significant adverse impacts on the criteria relating to the economy, there is likely to be a subsequent very poor value for money from implementing any speed limit changes across the corridor, except for VI(e), which includes the link approaching St Clears. This is due to the shorter distance of which this change would be implemented, and it is also notable that it is a link which is approaching a more urban setting.

With regards to safety impacts from a reduction in speed, a review of the collision history has been undertaken and there are a relatively low number attributed to speed related incidents, and the 85th percentile speed has been observed to be lower than the speed limit itself. With the Welsh Government Guidance on Setting of Speed Limits in mind, at this stage it is not considered a suitable measure for further assessment, aside from VI(e), with alternative safety improvements being developed as part of the study.

It is recommended that only VI(e) is included as part of the preferred package.

3.5.2. Amendments to Junctions (VI4, VI5 & VI6)

Each of the options at the junctions have been appraised to identify a preferred package of junction interventions. It is considered that the potential to develop a grade separated junction at Meidrim presents an opportunity to develop a medium and longer-term intervention package. A summary of the preferred options for each of the junctions is presented in **Table 3-9**.

Junction		Without GSJ at Meidrim		With GSJ at Meidrim	
		Preferred Option	Description	Preferred Option	Description
J5	Travellers Rest	J5DMin	Improvements to existing geometries.	J5DMin	Improvements to existing geometries.
J6	Market Hall Vets	J6DS(a)	Full closure; Relocation of access.	J6DS(a)	Full closure; Relocation of access.
J7	Private Access	J7DS(a)	Full closure; Relocation of access.	J7DS(a)	Full closure; Relocation of access.
J8	Western Power	J8DS(a)	Improvements to existing geometries; Restriction of right-turn out movement; Restriction of u-turn manoeuvres.	J8DS(b)	Improvements to existing geometries; Closure of the central reservation.
J9	Private Access	J9DS(a)	Improvements to existing geometries; Restriction of right-turn out movement; Restriction of u-turn manoeuvres.	J9DS(b)	Improvements to existing geometries; Closure of the central reservation.
J10	Carmarthen Showground	J10DMin	Improvements to existing geometries.	J10DMin	Improvements to existing geometries.
J11	Ffoshelig Coaches / Agricultural Access	J11DS(a)	Improvements to existing geometries (Ffoshelig Coaches arm); Restriction of right-turn out movement (Ffoshelig Coaches arm); Full closure (Agricultural Access arm); Restriction of westbound u-turn manoeuvres.	J11DS(b)	Improvements to existing geometries (Ffoshelig Coaches arm); Closure of the central reservation; Full closure (Agricultural Access arm).
J12	Tenby Road Filling Station	J12DMo(a)	Improvements to existing geometries; Introduction of eastbound merge lane.	J12DMo(a)	Improvements to existing geometries; Introduction of eastbound merge lane.
J13	Golf Club / Private Access	J13DS(a)	Improvements to existing geometries; Restriction of right-turn out movement (Golf Club arm); Restriction of right-turn in movement (Private Access arm); Restriction of u-turn manoeuvres.	J13DS(b)	Improvements to existing geometries; Closure of the central reservation.
J14	Meidrim	J14DMo(a(ii))	Improvements to existing geometries; Restriction of right-turn out movement; Restriction of westbound u-turn manoeuvres; Introduction of eastbound merge lane.	J14DMo(b)	Compact grade-separated junction.
J15	Agricultural Accesses	J15DS(a)	Full closure.	J15DS(a)	Full closure.
J16	Private Access / Bragty	J16DS(a)	Improvements to existing geometries; Restriction of right-turn in movement (Bragty arm); Full closure (Private Access arm).	J16DS(a)	Improvements to existing geometries; Restriction of right-turn in movement (Bragty arm); Full closure (Private Access arm).
J17	Agricultural Accesses	J17DS(a)	Full closure.	J17DS(a)	Full closure.
J18	Private Access / Llangynog	J18DS(a)	Improvements to existing geometries; Full closure (Private Access arm); Restriction of eastbound u-turn manoeuvres.	J18DS(b)	Improvements to existing geometries; Full closure (Private Access arm); Restriction of eastbound u-turn manoeuvres; Restriction of right-turn in movement (Llangynog arm).
J19	Bancyfelin	J19DS(a(ii))	Improvements to existing geometries; Restriction of right-turn in movement; Restriction of westbound u-turn manoeuvres.	J19DS(b)	Improvements to existing geometries; Closure of the central reservation; Restriction of left-turn out movement.
J20	Private Access	J20DS(a)	Full closure; Relocation of access.	J20DS(a)	Full closure; Relocation of access.
J21	Private Access	J21DS(a)	Improvements to existing geometries; Restriction of left-turn in movement; Restriction of left-turn out movement; Restriction of right-turn out movement.	J21DS(b)	Full closure.

Junction		Without GSJ at Meidrim		With GSJ at Meidrim	
		Preferred Option	Description	Preferred Option	Description
J22	Private Access	J22DS(a)	Improvements to existing geometries; Restriction of right-turn out movement.	J22DS(b)	Improvements to existing geometries; Closure of the central reservation.
J23	Private Access / Agricultural Access	J23DS(a)	Full closure; Relocation of access (Private Access arm).	J23DS(b)	Full closure; Relocation of access (Private Access arm).
J24	CLH Storage	J24DS(a)	Improvements to existing geometries; Restriction of right-turn in movement.	J24DS(b)	Improvements to existing geometries; Closure of the central reservation.
J25	Private Access	J25DMin	Improvements to existing geometries.	J25DMin	Improvements to existing geometries.
J26	Bryn-y-Gaer / Private Access	J26DS(a)	Improvements to existing geometries; Restriction of right-turn in movement (Bron-y-Gaer arm); Restriction of right-turn out movement (Private Access arm).	J26DS(b)	Improvements to existing geometries; Closure of the central reservation.
J27a	Private Access	J27aDS(a)	Full closure; Relocation of access.	J27aDS(a)	Full closure; Relocation of access.
J27b	Agricultural Access	J27bDS(a)	Full closure.	J27bDS(a)	Full closure.
J28	Private Access / Eglwys Llanfihangel Abercowin	J28DS(a)	Improvements to existing geometries; Restriction of right-turn in movement (Private Access arm); Restriction of right-turn out movement (Eglwys Llanfihangel Abercowin arm).	J28DS(b)	Improvements to existing geometries; Restriction of right-turn in movement (Private Access arm); Restriction of right-turn out movement (Private Access arm); Restriction of right-turn out movement (Eglwys Llanfihangel Abercowin arm).
J29a	Private Access	J29aDS(a)	Full closure; Relocation of access.	J29aDS(a)	Full closure; Relocation of access.
J29b	Forge Restaurant, Lodge and Filling Station	J29bDMo(a)	Rationalisation of site layout; Introduction of westbound merge lane; Introduction of westbound diverge lane.	J29bDMo(a)	Rationalisation of site layout; Introduction of westbound merge lane; Introduction of westbound diverge lane.
J30	Agricultural Access	J30DS(a)	Full closure.	J30DS(a)	Full closure.
J31	Private Access	J31DS(a)	Full closure; Relocation of access.	J31DS(a)	Full closure; Relocation of access.
J32	Agricultural Access	J32DS(a)	Full closure.	J32DS(a)	Full closure.
J33	Private Access	J33DS(a)	Full closure; Relocation of access.	J33DS(a)	Full closure; Relocation of access.
J34	Waunbricks	J34DS(a)	Improvements to existing geometries; Closure of the central reservation.	J34DS(a)	Improvements to existing geometries; Closure of the central reservation.
J35	Agricultural Access	J35DS(a)	Full closure.	J35DS(a)	Full closure.
J36	Coast to Coast Caravans	J36DMin	Improvements to existing geometries.	J36DMin	Improvements to existing geometries.
J37	Pentre Road Slip	J37DMin	Improvements to existing geometries.	J37DMin	Improvements to existing geometries.
J38	Agricultural Access	J38DS(a)	Full closure.	J38DS(a)	Full closure.
J39a	Agricultural Access	J39aDS(a)	Full closure.	J39aDS(a)	Full closure.
J39b	Agricultural Access	J39bDS(a)	Full closure.	J39bDS(a)	Full closure.
J40	High Street Slips	J40DS(a)	Improvements to existing geometries; Amendments to westbound off-slip priority junction.	J40DS(a)	Improvements to existing geometries; Amendments to westbound off-slip priority junction.

Table 3-9 *Summary of Preferred Options (VI4, VI5 & VI6)*

A summary of the option impact appraisal undertaken for the preferred Amendments to Junctions (VI4, VI5 & VI6) package is provided in **Table 3-10**, with the estimated cost of the package summarised in **Table 3-11**.

Assessment Criteria	Without GSJ at Meidrim	Without GSJ at Meidrim
Social and Cultural		
Physical Activity	0	0
Security	0	0
Severance	0	0
Journey Quality	+ + +	+ + +
Option Values and Non-Use Values	0	0
Accessibility	0	0
Personal Affordability	0	0
Environment		
Noise	0	0
Air Quality	0	0
Greenhouse Gases	-	-
Landscape and Townscape	0	-
Heritage and Historic Environment	0	0
Economy		
Journey Time Changes	- -	-
Journey Time Reliability	+ + +	+ + +
Collisions	+ + +	+ + +
Land	0	0
Cost	---	---
Value for Money	High	High

Table 3-10 *Appraisal Summary Table – Preferred Packages – Amendments to Junctions (VI4,5,&6))*

Option	Investment Cost	Investment Cost (with Inflation)	Investment Cost (with Inflation & OB)	Present Value of Costs
Without GSJ at Meidrim	£6,800,000	£7,500,000	£9,200,000	£5,600,000
With GSJ at Meidrim	£14,900,000	£16,500,000	£20,300,000	£12,300,000

Table 3-11 *Estimated Costs – Preferred Packages – Amendments to Junctions (VI4, VI5 & VI6)*

The option impact appraisal demonstrates that the preferred package of amendments to junction is likely to have significant beneficial impacts on collisions, journey time reliability and journey quality, whilst a reasonable value for money can be expected.

Although it is acknowledged there could be some adverse journey time impacts and an increase in carbon emissions, it is considered that these impacts are likely to be minor in the context of the potential safety benefits and the national annual emissions from transportation in Wales.

On this basis, it is considered that both packages are appropriate for further consideration at WelTAG Stage Three.

3.5.3. Amendments to Laybys (VI8)

A summary of the option impact appraisal undertaken for the Amendments to Laybys (VI8) options is provided in **Table 3-12**, with the estimated cost of the options summarised in **Table 3-13**.

Assessment Criteria	VI8DMin	VI8DS	VI8DMo
Social and Cultural			
Physical Activity	0	0	0
Security	0	+	+
Severance	0	0	0
Journey Quality	+	+ +	+
Option Values and Non-Use Values	0	0	0
Accessibility	0	0	0
Personal Affordability	0	0	0
Environment			
Noise	0	0	0
Air Quality	0	0	0
Greenhouse Gases	0	0	0
Landscape and Townscape	0	0	0
Heritage and Historic Environment	0	0	0
Economy			
Journey Time Changes	0	0	0
Journey Time Reliability	+	+	+
Collisions	+	+	+
Land	0	-	-
Cost	-	- -	- - -
Value for Money	High	Poor	Poor

Table 3-12 *Appraisal Summary Table – Amendments to Laybys (VI8)*

Option	Investment Cost	Investment Cost (with Inflation)	Investment Cost (with Inflation, Risk & OB)	Present Value of Costs
VI8DMin	£100,000	£100,000	£200,000	£100,000
VI8DS	£1,100000	£1,200,000	£1,500,000	£900,000
VI8DMo	£7,100,000	£7,900,000	£9,800,000	£5,900,000

Table 3-13 *Estimated Costs – Amendments to Laybys (VI7)*

It is considered that all the options are likely to have a beneficial impact on the social and cultural criteria, with limited impacts on the environment. It is considered that option VI8DS is likely to have the largest beneficial impact, through a combination of closing existing sub-standard facilities and improving those being retained. However, VI8DS may require some third-party land which may be a deliverability challenge. It is noted that only one collision has been recoded where a layby was noted as a contributing factor, and therefore the VI8DMin may be a reasonable fall-back solution subject to detailed assessment at WelTAG Stage Three. VI8DMo is not considered a proportionate intervention in this stage.

3.5.4. Hard Shoulder (VI31)

A summary of the option impact appraisal undertaken for the potential Hard Shoulder (VI31) option is provided in **Table 3-14**, with the indicative cost of the option summarised in **Table 3-15**.

Assessment Criteria	VI20
Social and Cultural	
Physical Activity	0
Security	0
Severance	0
Journey Quality	+ +
Option Values and Non-Use Values	0
Accessibility	0
Personal Affordability	0
Environment	
Noise	0
Air Quality	0
Greenhouse Gases	0
Landscape and Townscape	-
Heritage and Historic Environment	0
Economy	
Journey Time Changes	0
Journey Time Reliability	+
Collisions	0
Land	- -
Cost	- - -
Value for Money	Poor

Table 3-14 *Appraisal Summary Table – Hard Shoulder (VI31)*

Option	Investment Cost	Investment Cost (with Inflation)	Investment Cost (with Inflation, Risk & OB)	Present Value of Costs
VI31	£33,100,000	£37,100,000	£45,700,000	£27,200,000

Table 3-15 *Estimated Costs – Hard Shoulder (VI31)*

The appraisal indicates that whilst there may be some benefit to journey quality, there are limited other benefits across the range of criteria, and it is notable that the option presents a very high-cost intervention, which provides a poor value for money; which is pertinent given the vehicle infrastructure theme of the option. It is not recommended that this is taken forward for further analysis at this stage.

3.6. Summary of a Preferred Options Package

3.6.1. Preferred Options

The following options are considered appropriate for further consideration and assessment at the next stage of the study:

- **Active Travel –** AT1, AT2, AT5,6,7a/b;
- **Public Transport –** PT7DS/PT7DMo; and
- **Vehicle Infrastructure –** VI1(e),VI5,6&7 with or without a grade-separated junction at Meidrim, and VI8DS.

As described above, there are also some supplementary measures that can be further considered as part of the preferred package detailed development.

It is also important to highlight that within the preferred package, there are opportunities to fast-track individual lower-cost measures along the corridor. This can be identified at the outset of the Stage Three process.

A summary of the options included within the preferred options package for further consideration and development is provided in **Table 3-16**. It is considered that the options should be further progressed as part of a WelTAG Stage Three study, although it is acknowledged that a number of the options could be prioritised or implemented in isolation as quick win or short-term measures. Further consideration of the prioritisation of options should be undertaken as part of the Review Group discussions.

Ref.	Description
Active Travel Measures	
AT1	SUP and Cycleway Improvements.
AT2	Meidrim to Bancyfelin Active Travel Route.
AT5/6/7(a) OR A&5/6/7(b)	Public Rights of Way and Crossing Improvements.
Public Transport Measures	
PT7DS OR PT7DMo	Bus Stop Infrastructure and Active Travel Linkages.
Vehicle Infrastructure Measures	
VI1(e)	Speed Limit Change – St Clears.
VI4/5/6 (Without GSJ at Meidrim) OR VI4/5/6 (With GSJ at Meidrim)	Amendments to Junction Layouts.
VI8DS	Amendments to Laybys.
Supplementary Measures	
AT9	Removal of Legacy NCN4 Signage
AT11	Traffic Regulation Order to Restrict On-Carriageway Pedestrians and Cyclists
AT12	Pedestrian Warning Signs
VI27	Agricultural Vehicle Warning Signs
VI29	Street Lighting
VI33	Noise Mitigation
PT4	Bus Vehicle Actuated Signs at the Meidrim (J14) and/or Bancyfelin (J19) Junctions
SH3	Variable Information Boards

Table 3-16 *Summary of Preferred Options Package*

3.6.2. Appraisal of Preferred Options Package

The cumulative impacts of the preferred options package have also been assessed utilising the WelTAG appraisal criteria.

Noting the potential layouts of the pedestrian crossing will be dependent upon further stakeholder engagement and detailed survey information, the preferred options package has been assessed to account for the range of preferred measures still being considered in the detailed development of the study at the next stage.

The option impact appraisal of the preferred options package is summarised in **Table 3-17**, with the estimated cost of the options summarised in **Table 3-18**.

Assessment Criteria	Without GSJ at Meidrim & At-Grade Crossings	Without GSJ at Meidrim & Grade-Sep Crossings	With GSJ at Meidrim & At-Grade Crossings	With GSJ at Meidrim & Grade-Sep Crossings
Social and Cultural				
Physical Activity	+	+	+	+
Security	+	+	+	+
Severance	0	+	0	+
Journey Quality	+ + +	+ + +	+ + +	+ + +
Option Values and Non-Use Values	0	0	0	0
Accessibility	+	+ +	+	+ +
Personal Affordability	0	0	0	0
Environment				
Noise	0	0	0	0
Air Quality	0	0	0	0
Greenhouse Gases	-	-	-	-
Landscape and Townscape	-	-	-	-
Heritage and Historic Environment	0	0	0	0
Economy				
Journey Time Changes	- -	- -	- -	- -
Journey Time Reliability	+ + +	+ + +	+ + +	+ + +
Collisions	+ + +	+ + +	+ + +	+ + +
Land	-	-	-	-
Cost	- - -	- - -	- - -	- - -

Table 3-17 *Appraisal Summary Table – Preferred Options Package*

Scenario		Investment Cost	Investment Cost (with Inflation)	Investment Cost (with Inflation, Risk & OB)	Present Value of Costs
Without GSJ at Meidrim	At-Grade Crossing	£11,300,000	£12,500,000	£15,400,000	£9,200,000
	Grade-Separated Crossing	£13,600,000	£15,100,000	£18,500,000	£11,200,000
With GSJ at Meidrim	At-Grade Crossing	£19,400,000	£21,500,000	£26,400,000	£15,900,000
	Grade-Separated Crossing	£21,700,000	£24,100,000	£29,600,000	£17,900,000

Table 3-18 *Estimated Costs – Preferred Options Package*

It is expected that all scenarios are likely to significantly reduce the likelihood of collisions across the corridor, having subsequent beneficial impacts on journey time reliability and journey quality. Whilst some journey time disbenefits are expected associated with vehicles re-routing following the closure of a number of central reservations, the appraisal indicates that this will be minor in comparison to the safety benefits of the scheme.

Whilst it is illustrated within the table that the overall benefits of the scenarios with and without a grade-separated junction at Meidrim (J14) are comparable, it should be noted that the introduction of a larger intervention in this location enables additional restriction on cross-carriageway manoeuvres which notably increases safety benefits along the route. This being said, it is considered that even without a grade-separated junction at Meidrim (J14) a significant safety benefit compared to existing can be achieved as part of this option, which demonstrates the potential merits of implementing this package in the absence of a larger intervention at Meidrim.

The appraisal also accounts for the slight adverse impact on carbon emissions specifically from the re-routed vehicles, which is considered minor in the context of the annual carbon budget in Wales. It should also be noted that measures to offset this will be explored at the next stage, as part of the detailed design of the schemes, which could include measures such as planting to increase carbon capture within the corridor. On this basis, the potential slight adverse impact on the environment should be considered against the context of the significant safety benefits, which is considered to be the principal driver of this scheme.

It should also be noted that the preferred options package could have a beneficial impact on a number of the social and cultural criteria, due to the introduction of improved facilities for pedestrians, bus users and layby users, in all scenarios.

3.7. Alignment of Preferred Package with Wales Transport Strategy

WTS Criteria	Appraisal	Justification
WTSP1 Bring services to people in order to reduce the need to travel.	0	The measures included within the preferred option package are focused on safety and efficiency within the scheme area, and do not focus on any land-use planning elements, although it should be noted that improved journey time reliability could perceptively bring services closer to people in the region. Therefore, the score on reducing the need to travel is considered neutral.
WTSP2 Allow people and goods to move easily from door to door by accessible, sustainable and efficient transport services and infrastructure.	++	The preferred option package is considered to improve safety across the corridor which will improve journey time reliability and subsequently provide a much more efficient transport network in the region. In addition, alternative modes of travel could be encouraged through the improvements to the active travel network proposed. This allows people, in a rural setting, to access key goods and services such as medical facilities more efficiently, whilst improvements to bus stop infrastructure and connectivity to the facilities could enable users to travel by this sustainable mode. It is also important to note that preferred option package is intended to make better use of existing road infrastructure wherever possible.

WTSP3 Encourage people to make the change to more sustainable transport.	++	The preferred option package includes a recommendation to develop a coherent active travel network along the corridor, connecting settlements such as St Clears, Bancyfelin and Carmarthen. It also includes an improvement to key crossing points and improvements to the bus laybys, both of which could encourage more people to walk or travel by bus between settlements, although it is acknowledged the potential catchment is limited.
WBA1 Good for People and Communities.	++	Improvements to the active travel and bus networks are considered to improve health, equality and safety within and surrounding the scheme area. In addition, the preferred option package proposes changes to the existing junctions which reduces safety risks across the corridor, which can have subsequent benefits to health, confidence and safety.
WBA2 Good for the Environment.	0	Whilst reducing the potential for collisions, increasing the resiliency of the scheme area whilst making better use of existing road infrastructure, is considered to be good for the environment, it is acknowledged that amending the layouts of junctions is likely to increase journey distances for some road users. However, minimising the safety risk for active travel users could increase the attractiveness of active travel modes in the area, contributing towards the social and environmental well-being of the region. It is also considered that further detailed consideration of the potential for biodiversity improvements (through additional planting and landscaping) will form an important part of Stage Three.
WBA3 Good for the Economy and Places in Wales.	+	A key objective of the preferred options package is to ensure no significant adverse impact on the operational efficiency of the strategic highway network, noting the strategic importance of the route in the context of the regional and national economy. Minimising the impact on access, which was also a key consideration in the development of options, will also ensure that opportunities will be retained for people and places in both urban and rural parts of the region. It is also noted that providing an improvement in safety for vehicle users is likely to reduce the potential for collisions, increasing the viability of the A40 as a safe and attractive route; ensuring well-connected communities in the surrounding area, which could also bring benefits to tourism.
WBA4 Good for Culture and the Welsh Language.	0	Cadw have been engaged with as part of the study, with the potential options being considered against the potential impact on the historic environment, noting no impacts on the historic environment has been forecast. Whilst there have not been any opportunities to enhance the historic environment or the Welsh language identified, the preferred option package will be developed and delivered in line with national guidance that ensures Welsh is treated equally to English whilst on-going engagement with Cadw will ensure that the historic environment is protected wherever possible.

Table 3-19 *Alignment of Preferred Option Package with Wales Transport Strategy*

A review of the preferred options package indicates that the measures as a whole are aligned with the WTS, noting the principal focus of the study on safety within the scheme area.

4. Financial Case

4.1. Overview

The financial case provides an indication of whether an intervention is affordable at construction and in the long-term, in addition to considering the sources of funding.

4.2. Costs

The costs of the potential options have been estimated based on concept drawings where necessary and a combination of industry standard rates and rates from previously completed projects, based on Q1 2021 prices. For the purpose of this financial case, the following costs are presented:

- **Investment Cost –** cost based on Q1 2021 prices, excluding allowances for VAT, inflation, risk and optimism bias;
- **Investment Cost + Risk –** cost based on Q1 2021 prices including an allowance for risk but excluding VAT, inflation and optimism bias; and
- **Outturn Cost –** cost that includes an allowance for inflation and risk, presenting the actual cash value which would be incurred when the cost occurs.

4.2.1. Active Travel

A summary of the investment and outturn costs estimated for the active travel options is provided in **Table 4-1**.

Option Ref	Investment Cost	Investment Cost + Risk	Outturn Cost
AT1	£1,200,000	£1,400,000	£1,600,000
AT2	£1,400,000	£1,600,000	£1,800,000
AT5/6/7a	£200,000	£300,000	£300,000
AT5/6/7b	£1,400,000	£1,600,000	£1,800,000

***Table 4-1** Estimated Investment and Outturn Costs – Speed Limit Changes (VI1)*

4.2.2. Public Transport

PT7 – Bus Stop Infrastructure

A summary of the investment and outturn costs estimated for the PT7 options is provided in **Table 4-2**.

Option	Investment Cost	Investment Cost + Risk	Outturn Cost
PT7DMin	£270,000	£310,000	£350,000
PT7DS	£510,000	£580,000	£650,000
PT7DMo	£1,700,000	£1,900,000	£2,100,000

***Table 4-2** Estimated Investment and Outturn Costs – Bus Stop Infrastructure (PT10)*

4.2.3. Vehicle Infrastructure

VI1 – Speed Limit Changes

A summary of the investment and outturn costs estimated for the Speed Limit Changes (VI1) options is provided in **Table 4-3**.

Option Ref	Investment Cost	Investment Cost + Risk	Outturn Cost
VI1DS(a)	£49,000	£56,000	£63,000
VI1DS(b)	£29,000	£34,000	£37,000
VI1DS(c)	£29,000	£34,000	£38,000
VI1DS(d)	£27,000	£31,000	£35,000
VIDS(e)	£20,000	£23,000	£25,000

***Table 4-3** Estimated Investment and Outturn Costs – Speed Limit Changes (VI1)*

VI5,6&7– Amendments to Junctions

A summary of the investment and outturn costs estimated for the preferred Amendments to Junctions (VI5,6&7) package of measures is provided in **Table 4-4**.

Option	Investment Cost	Investment Cost + Risk	Outturn Cost
Without GSJ at Meidrim	£6,800,000	£7,800,000	£8,800,000
With GSJ at Meidrim	£14,900,000	£17,200,000	£19,300,000

***Table 4-4** Estimated Investment and Outturn Costs – Preferred Package – Amendments to Junctions (VI5,6&7)*

It should be noted however, that whilst the total package is presented within **Table 4-4**, there are opportunities to deliver the package across the short, medium and longer term, with each individual junction measure generally being less than £500,000 in out-turn costs.

Amendments to Laybys (VI8)

A summary of the investment and outturn costs estimated for the VI8DMin, VI8DS and VI8DMo options is provided in **Table 4-5**.

Option	Investment Cost	Investment Cost + Risk	Outturn Cost
VI8DMin	£130,000	£140,000	£150,000
VI8DS	£1,100,000	£1,200,000	£1,400,000
VI8DMo	£7,200,000	£8,200,000	£9,300,000

***Table 4-5** Estimated Investment and Outturn Costs – Amendments to Laybys (VI8)*

Hard Shoulder (VI20)

A summary of the investment and outturn costs estimated for the Climbing Lane (VI10) option is provided in **Table 4-6**.

Option	Investment Cost	Investment Cost + Risk	Outturn Cost
VI31	£32,900,000	£38,200,000	£42,000,000

***Table 4-6** Estimated Investment and Outturn Costs – Hard Shoulder (VI20)*

4.2.4. Preferred Options Package

The preferred options have been combined to provide a preferred options package cost, for a scenario with and without a GSJ at Meidrim in place. For the options the low and high-cost options are presented for the active travel options, whereby the detailed design of the option could vary significantly depending on whether an at-grade or grade-separated solution is recommended at WelTAG Stage Three. In addition, it should be noted that this cost is inclusive of the potential active travel link through Bancyfelin, which is located on CCCs INM

A summary of the investment and outturn costs estimated for the overall preferred options package is provided in **Table 4-7**.

Scenario		Investment Cost	Investment Cost + Risk	Outturn Cost
Without GSJ at Meidrim	At-Grade Crossing	£11,300,000	£12,900,000	£14,600,000
	Grade-Separated Crossing	£13,600,000	£15,600,000	£17,600,000
With GSJ at Meidrim	At-Grade Crossing	£19,400,000	£22,300,000	£25,100,000
	Grade-Separated Crossing	£21,700,000	£25,000,000	£28,100,000

***Table 4-7** Estimated Investment and Outturn Costs – Preferred Options Package*

It is expected that the total investment for the preferred package could range between £14m and £28m in outturn costs, depending on the preferred option identified for the crossing to the west of the scheme area. This could also change dependent on any additional supplementary measures that may be incorporated into the further development (such as lighting).

It is also important to note that there are opportunities to deliver elements of the preferred package in isolation (such as specific junctions), that can be tailored to available budgets.

4.3. Funding Sources

The varying nature of interventions included within this WelTAG Stage Two means that there could be a combination of funding streams required in order to deliver the preferred package. It is considered likely that the majority of funding for the preferred solution will be required from Welsh Government sources, with limited surrounding developments from which to obtain private sector investment.

The current works programme is being delivered within the Welsh Government Pinch-Point and Upgrades work stream, and as highlighted within the summary of the preferred package, there are a number of lower-cost measures that can be delivered through this continued works programme. In addition, there is sufficient funding within this works programme to develop a WelTAG Stage Three appraisal for the more significant investment options.

With the combined interventions potentially resulting in a significant investment from Welsh Government's transport budget and capital investment programme., there may be a requirement for additional funding from the Infrastructure Delivery Division (IDD), supporting major projects. It is also acknowledged that some measures (such as AT1) are located on CCCs INM, and therefore funding for this specific element could be sourced from CCCs active travel budget.

There may also be opportunities to explore private sector and / or Local Authority funding at WelTAG Stage Three, through planning contributions from private developers along the corridor.

5. Commercial Case

5.1. Overview

The commercial case demonstrates whether an option is commercially viable and whether it is possible to procure the scheme(s) and continue with it in the future. It should be fully developed by the end of Stage Three, and will identify aspects such as procurement methods.

5.2. Procurement

Due to the uncertainties associated with the potential delivery arrangements at this stage, a review of the procurement strategy of the preferred solution will be undertaken at the next stage. However, it is expected that the scheme would be delivered either through SWTRA, as the acting agent on behalf of Welsh Government, or by the IDD at Welsh Government.

Both Welsh Government and SWTRA have significant experience of successfully procuring construction and maintenance works, and therefore it is considered likely that successful procurement of the preferred solution should be possible through their existing supply chain partners.

6. Management Case

6.1. Overview

The Management Case outlines whether the options are deliverable at construction and over the scheme lifetime, as well as providing a summary as to how the options could be delivered.

It should be noted that the Management Case will be fully developed for the preferred solution as part of the next stage.

6.2. Review Group

A Review Group was established as part of the A40 Carmarthen to St Clears WelTAG Stage One study, and it is intended that the project board remains the same for this study.

The Review Group is responsible for disaggregating the information presented within the WelTAG Stage One report, before identifying key areas for further consideration at subsequent stages of WelTAG.

A meeting has also been held with CCC with regards providing input to the Review Group findings; and CCC will continue to provide comments should the study progress to Stage Three.

6.3. Project Delivery and Governance

There are a number of consents and/or permissions and associated assessments that may be required to facilitate the preferred package. The need for each of these permissions will be based on the preferred solution design.

Consideration will be given as to the most appropriate route to delivering the preferred package, through either planning permission under the Town and Country Planning Act 1990 using permitted development rights, or the Highways Act 1980

Within the Town and Country Planning (General Permitted Development) Order 1995, Part 13, states: *"The carrying out by a local highway authority on land outside but adjoining the boundary of an existing highway of works required for or incidental to the maintenance or improvement of the highway"*. The 1995 Order was subsequently amended to cover works carried out by all highway authorities, and therefore the permitted development rights apply to SWTRA acting as an agent on behalf of the Welsh Government, the highway authority.

At WelTAG Stage Three reference will be made to the guidance set out in Design Manual for Roads and Bridges (DMRB) LA102 'Screening of Projects for Environmental Impact Assessment' to determine whether screening for statutory EIA is required for the preferred package.

Consideration will be given to whether the preferred package should be considered an 'improvement' scheme, falling within Annex II of the EIA Directive, and whether the site is not located within or adjacent to a 'sensitive area' as defined by the EIA Regs 2017.

The Highways Act 1980 process is determined by Welsh Government; however, there is no fixed timeframe at the outset. If no objections to the Orders are received, the process can take several months; however, where objections are received a Public Inquiry will be required, which can take up to 15 months to resolve.

It should be noted that CPOs, Line Orders and Side Road Orders can all be incorporated under the Highways Act, if required. With specific reference to the Active Travel measures (i.e. potential of extinguishment of PRoW) consideration will need to be given to the most appropriate delivery route, which may be the use of Side Road Orders. Alternatively, they could be delivered via Section 118, known as public path extinguishment orders. Section 118 gives highways authorities discretionary powers to extinguish a path where the path is not needed for public use. However, within the context of this corridor, there may be a challenge in meeting the legal test for a successful Section 118 application. This will be considered in more detail at Stage Three.

6.4. Governance

All potential options are located on the A40 trunk road and therefore SWTRA, as the acting agent of Welsh Government, will be responsible for the management and maintenance of measures directly affecting the A40.

Whilst SWTRA will be responsible for the management and maintenance of the above, it is considered that CCC, as the Local Highway Authority, will be responsible for the management and maintenance of all adjoining routes impacted by the options.

With the above in mind, it is considered that detailed design of the preferred package will need to be undertaken with further engagement with CCC.

6.5. Communications and Stakeholder Management Plan

The process of stakeholder engagement and management undertaken as part of the A40 Carmarthen to St Clears study is summarised in Section 2.4**.** The stakeholder engagement has reached out to a range of stakeholder groups, including CCC, the surrounding town and community councils, adjacent businesses, public sector organisations, active travel groups and public transport operators.

It is envisaged that further engagement will be undertaken as part of the next stage, to ensure the preferred solution is appropriate; this will include a form of public consultation.

It is considered that any comments from the public consultation could be utilised to amend the preferred solution to minimise the potential for any objections following WelTAG Stage Three, if the solution is progressed to implementation.

6.6. Risk Management Strategy

A full list of the potential risks associated with the preferred solution, as well as the associated risk management measures, will be identified at the next stage. However, the initial risks and constraints associated with the study at this stage has been is summarised in Section 2.9.

6.7. Monitoring and Evaluation Plan

A monitoring and evaluation plan will be developed as part of the next stage of this study. The monitoring and evaluation plan will set out potential actions that can be undertaken to monitor and evaluate the success of the preferred solution, in the context of the TPOs, well-being goals and Wales Transport Strategy, following implementation.

7. Summary and Next Steps

7.1. Summary

This WelTAG Stage Two Report summarises the further assessment undertaken on the short-list of options identified at WelTAG Stage One. The Stage One study identified a case for change within the scheme area, specifically relating to the following:

- Unsuitable junction layouts in the context of the high-speed nature of the road;
- Adverse impacts on well-being, primarily applicable to the potential for collisions;
- Sub-standard public transport infrastructure provision;
- Limited active travel provision; and
- Poor scheme area resilience and ability to accommodate seasonal traffic.

Further development of the options identified at WelTAG Stage One has been undertaken as part of this study, with reference to current design guidance, traffic data analysis and stakeholder engagement. The options identified at Stage One were further developed, with a short list of options taken forward for assessment as part of the Transport Case, and a number of smaller scale options recommended for further development.

The Transport Case assessed a set of options, using criteria informed by WelTAG, to determine a preferred package of options that are considered suitable for detailed consideration at WelTAG Stage Three. Within this, a review of the preferred package of options has been undertaken in the context of the priorities and well-being ambitions of the WTS, which has identified that the preferred package is in line with this key policy document.

7.2. Preferred Package

The preferred options package consists of measures relating to the themes of:

- Active Travel;
- Public Transport; and
- Vehicle Infrastructure.

The principle focus of the package is to improve safety across the scheme area, and it is pertinent to note that where possible, better use is being made of existing road infrastructure.

In addition to this, the assessment has considered the potential impacts of the options on carbon, and it is considered that the preferred package is unlikely to lead to a significant increase in carbon emissions post-construction; however, it is acknowledged that some carbon is likely to be produced during the construction phase. In order to reduce any potential impacts on carbon, it is intended that further consideration of low-carbon construction methods is undertaken as part of WelTAG Stage Three, with prioritisation given to reducing the potential for the production of carbon as part of the construction process.

Of the options included within the preferred packages, there is a combination of short, medium, and longer-term options that could be progressed. It is acknowledged that a number of the options are smaller scale interventions that could be fast-tracked as individual options for the benefit of safety along the route, with a WelTAG Stage Three study undertaken to further develop the larger-scale package of measures. It is considered that the prioritisation of options should form a key aspect of the Review Group discussions following completion of this study, with the identification of an effective route to delivery for the options included within the preferred package identified.

7.3. Next Steps

It is recommended that the next step should be to progress a WelTAG Stage Three, which should include further development of the preferred package of options, in addition to consideration of the potential options that could be fast-tracked for the benefit of safety. This should be informed by, but not limited to:

- Pedestrian surveys at relevant PRoW and crossings;
- A GG 104 safety risk assessment on the PRoW proposals;
- Detailed design of options;
- Relevant carbon assessment, including consideration of measures to minimise the carbon impact of any interventions (such as the development of the soft estate or biodiversity corridors);
- Environmental surveys / assessments where appropriate;
- Value for money assessment of the preferred package, informed by appropriate modelling; and
- Stakeholder engagement and consideration of public consultation.

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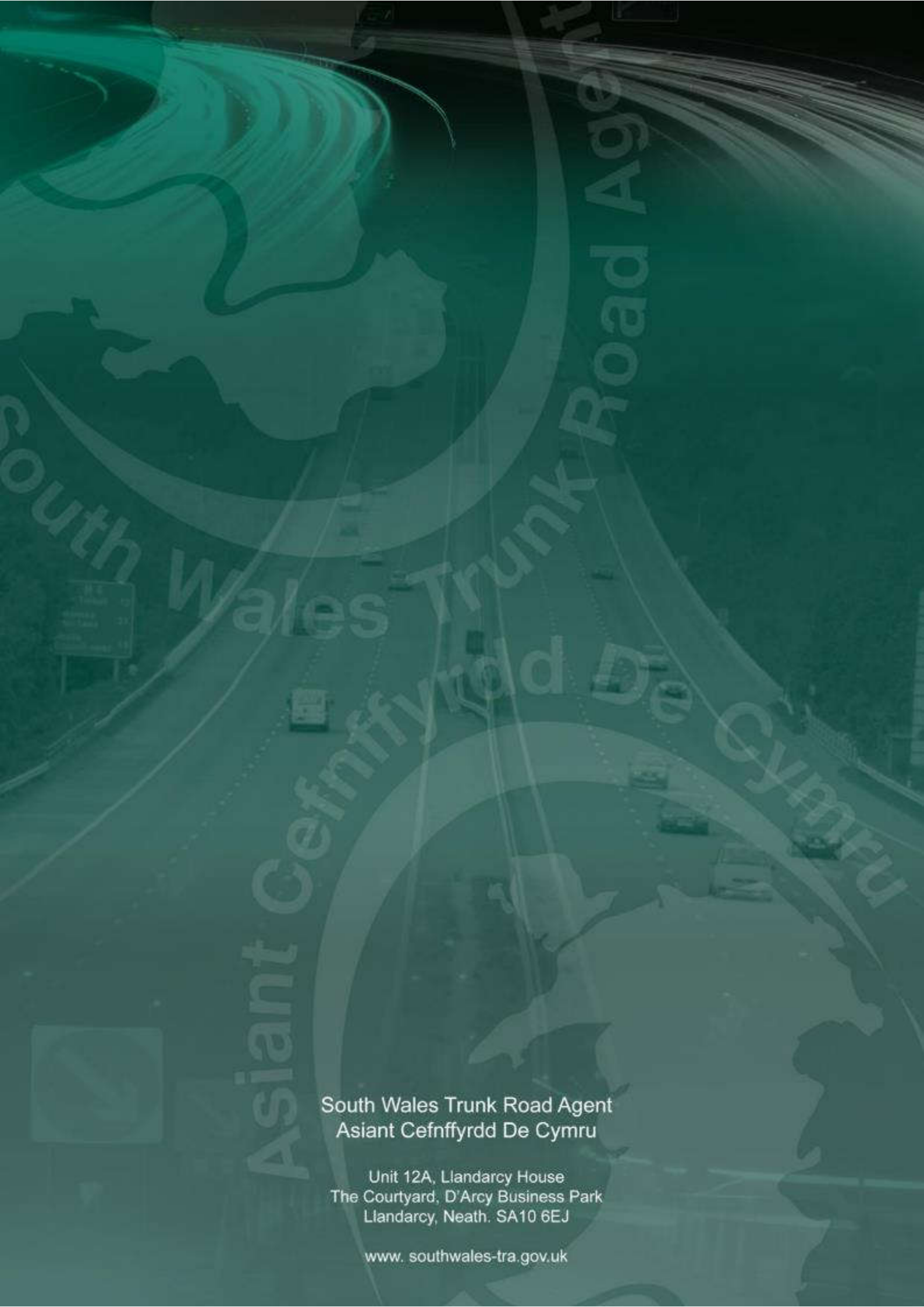

South Wales Trunk Road Agent
Asiant Cefnffyrdd De Cymru

Unit 12A, Llandarcy House
The Courtyard, D'Arcy Business Park
Llandarcy, Neath. SA10 6EJ

www. southwales-tra.gov.uk