

South Wales Trunk Road Agent

Managing and Improving
Motorways and Trunk Roads
through South Wales



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

A40 Carmarthen to St Clears

WeITAG Stage One 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 One Report

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1. Introduction

1.1. Background

Atkins Limited have been commissioned by the South Wales Trunk Road Agent (SWTRA) to produce a Stage One WeITAG study for the A40 between Carmarthen and St Clears. This WeITAG Stage One study considers a long-list of intervention options along this section of the A40, following identification of the transport problems. An understanding of existing issues has been developed from a combination of previous studies undertaken in the area, site visits, stakeholder feedback and a desktop review.

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 WeITAG Stage One studies are being undertaken alongside the A40 Carmarthen to St Clears WeITAG Stage One study for adjoining sections of the trunk road network.

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

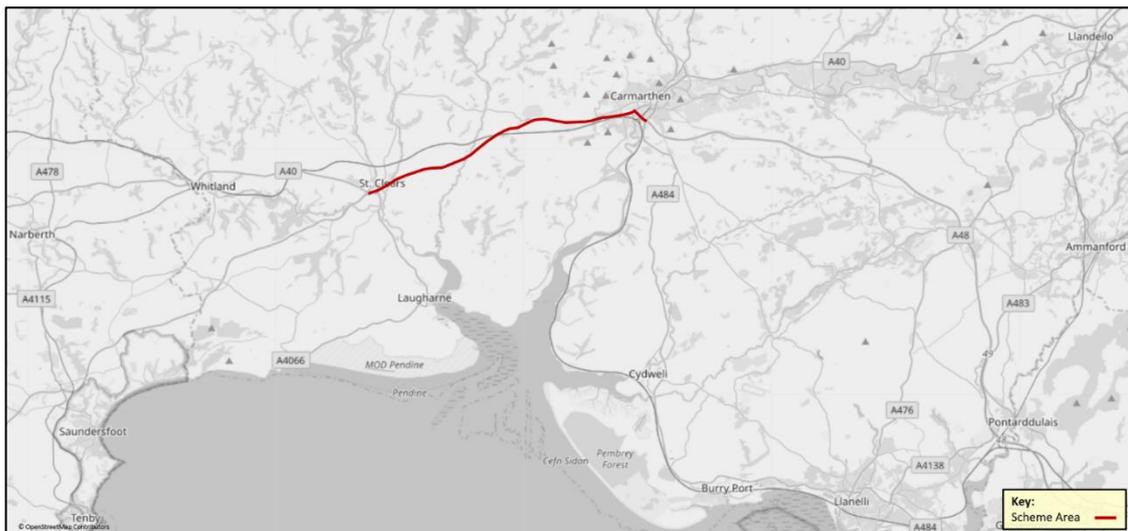


Figure 1-1 A40 Carmarthen to St Clears WeITAG Scheme Area

1.2. WeITAG Stage One

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

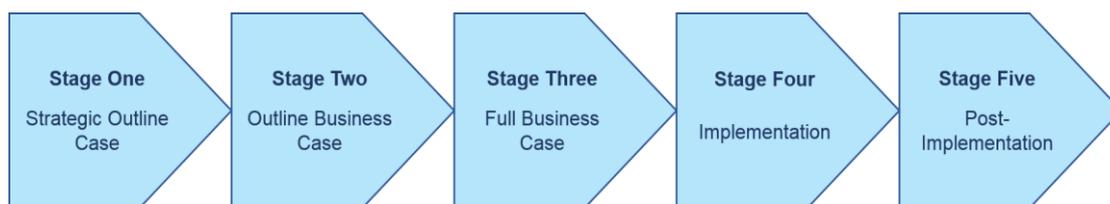


Figure 1-2 WelTAG Process

The purpose of a WelTAG Stage One (Strategic Outline Case) is to explore the existing context, issues and opportunities related to a proposed intervention in the transport system. The key outcome of a WelTAG Stage One study is to clearly define and understand the problem in order to make the case for change. It also forms the basis for setting a clear set of objectives for the scheme and is the starting point for developing a well-documented and robust evidence base for implementing a proposed intervention.

As part of WelTAG Stage One, a long-list of potential transport and non-transport intervention options should be developed and appraised, with a refined or preferred short-list of options taken forward to WelTAG Stage Two (Outline Business Case) for further analysis. In line with WelTAG, this Stage One report is broadly structured in the context of the ‘Five Cases’ model, which is a function used by the Welsh Government and HM Treasury for projects requiring public sector funding.

The Five Cases are as follows:

- **Strategic Case** – assessment of the need for change in the transport network, through examination of the existing and future scenario within the scheme area. Once the transport problems have been identified and considered in the context of the Well-being of Future Generations (Wales) Act, the strategic case describes the process of setting Transport Planning Objectives (TPOs) and developing a long-list of options to address the identified transport problems and meet the TPOs;
- **Transport Case** – an evidence-based assessment to discover whether the proposed options provide good public value for money. As part of the transport case, the potential interventions will need to be investigated in the context of social and cultural, environmental and economic impacts, as well as the Well-being of Future Generations (Wales) Act;
- **Delivery Case** – an overview of the delivery arrangements for the potential interventions, inclusive of the proposed procurement, construction and on-going operation of the options. The delivery case summarises whether each of the potential interventions are deliverable;
- **Financial Case** – details of the proposed funding mechanisms of the potential interventions and whether the long-term financial viability of each option is acceptable. The financial case summarises whether each of the potential interventions are considered affordable; and
- **Commercial Case** – description of the option aspects which determine whether each option is commercially viable. The commercial case will also specifically detail the relationship of the options with the private sector.

The amount of detail required for each of the Five Cases at different stages of the WelTAG process varies; with the requirement to complete all Cases by the end of WelTAG Stage Three. As part of WelTAG Stage One it is considered that the Strategic Case will be well developed, with initial assessments undertaken as part of the Transport Case to inform the identification of a short-list of options.

This WelTAG Stage One study follows the principle of proportionate appraisal and at the early stages of the scheme development presents a largely qualitative appraisal of potential options. It is intended to provide key stakeholders and decision makers with a greater understanding of the problems and potential options.

Whilst WelTAG recommends the use of a seven-point appraisal scale, consideration has been given to the stage of this study in determining the most appropriate metric for appraisal within this report. This WelTAG Stage One study has therefore utilised a simplified three-point appraisal scale, as it is considered that this level of detail is appropriate to provide relevant information for decision-makers to determine which interventions are suitable to be progressed at the end of WelTAG Stage One. It is important to recognise that a seven-point appraisal scale will be utilised as the WelTAG study develops (at Stage Two and Three), as further assessment detail and comparative analysis is undertaken between the interventions to determine the preferred option.

This WelTAG Stage One report provides a summary of the assessment work undertaken to develop work packages that will consider the short-listed options, with further details as to the process of assessment provided within the accompanying 'A40 Carmarthen to St Clears – Impact Assessment Report' ('IAR').

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 that no development will adversely impact the well-being of future generations. The Act plays a fundamental role in shaping WelTAG, with the guidance updated in 2017 to provide clarity as to how WelTAG studies should explicitly consider the well-being of future generations within the development and appraisal of potential interventions.

WeITAG 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 sustainability of any potential intervention. This WeITAG Stage One 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.

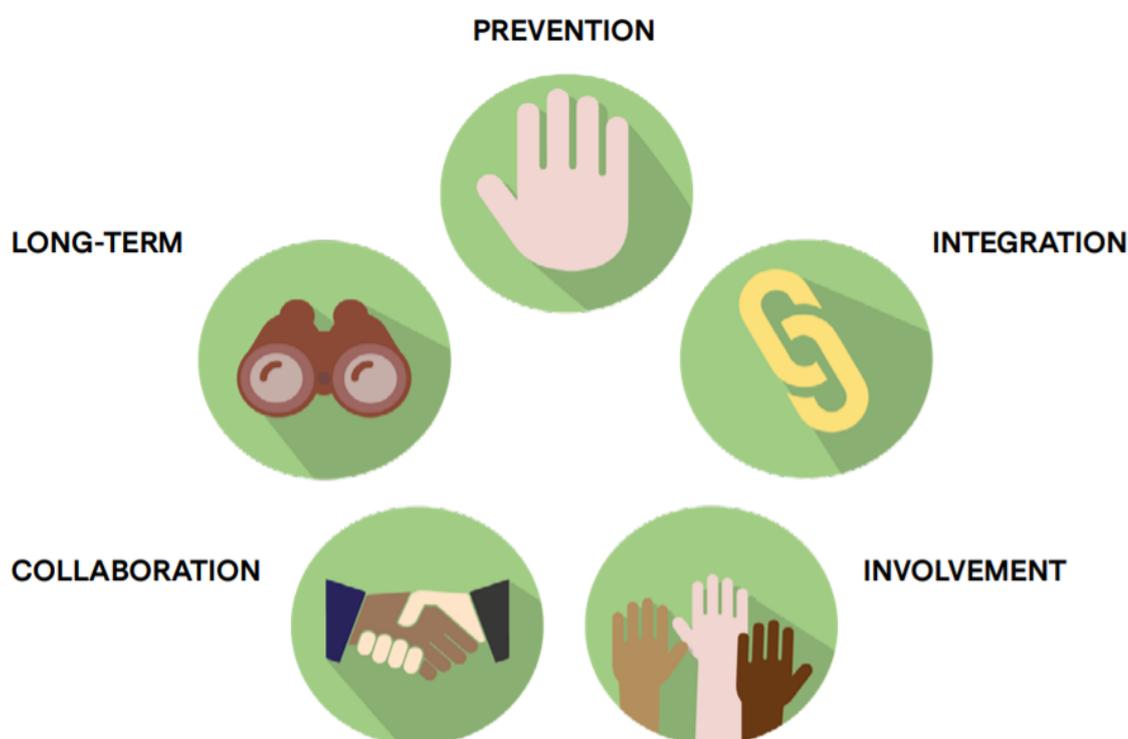


Figure 1-3 Well-being of Future Generations (Wales) Act – Five Ways of Working

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. Further consideration of the national and local well-being goals is provided in **Chapter 2** of this report.

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

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**.

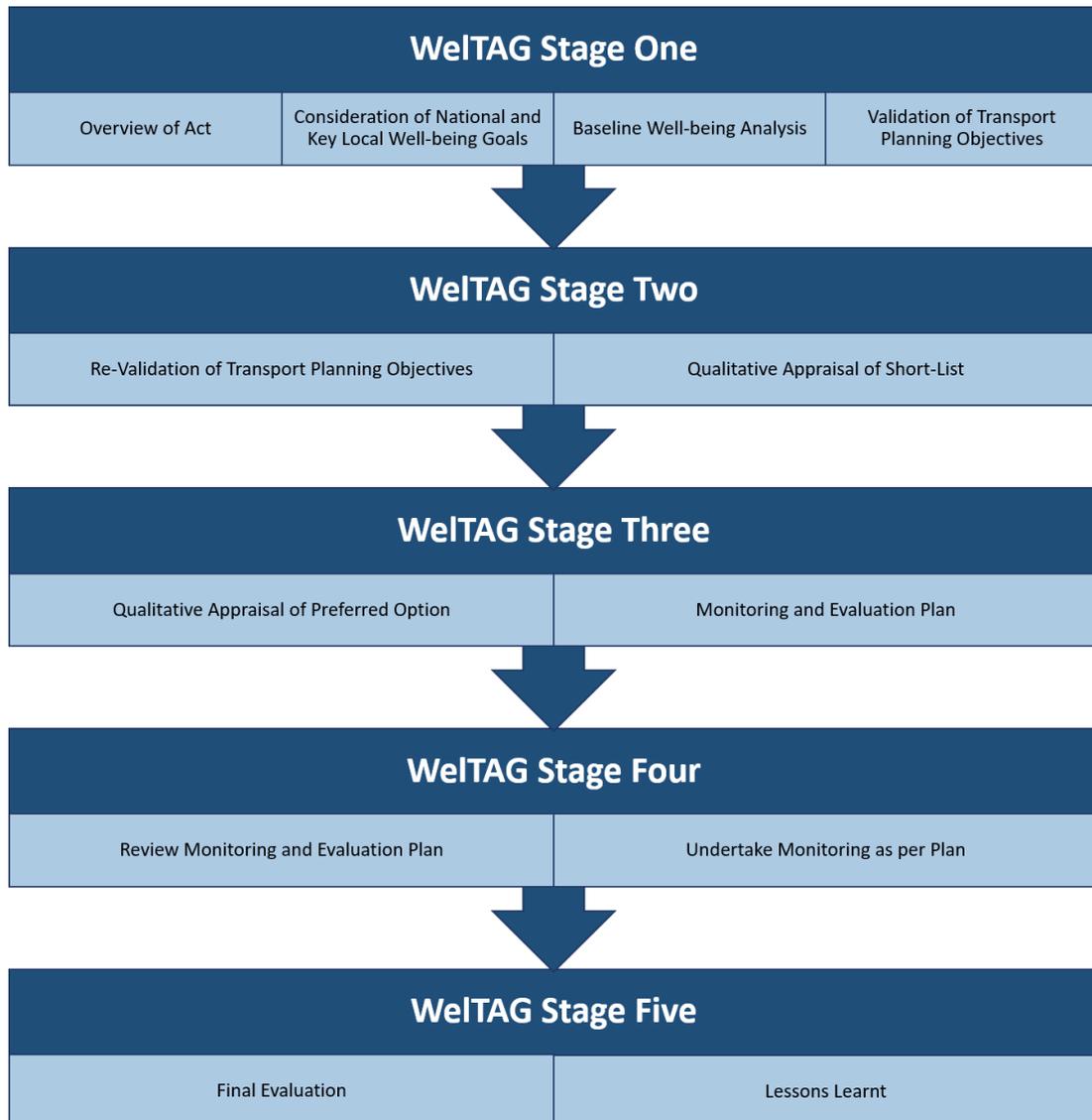


Figure 1-4 WellApp Framework

The four WellApp actions at WeITAG Stage One are provided at the following locations:

- Overview of Act – **Section 1.3**;
- Consideration of National and Key Local Well-being Goals – **Section 2.3.1**;
- Baseline Well-being Analysis, inclusive of a review of the impact of the Transport Problems on the well-being goals – **Table 2-6**; and
- Validation of Transport Planning Objectives against well-being goals – **Table 2-9**.

1.4. Structure of Report

This WeITAG Stage One 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, and appropriately evidence at what potential interventions may be required to address this need. This WeITAG Stage One report is therefore structured as follows:

- **Chapter 2** sets out the **Strategic Case** which: identifies the transport problems, sets the study objectives and introduces the long-list of potential interventions;
- **Chapter 3** presents the **Transport Case** which: assesses the long-list of options against the TPOs and well-being goals, and considers a short-list of options for further consideration;
- **Chapter 4** summarises a framework for the **Delivery, Financial and Commercial Cases** which, in accordance with WeITAG guidance will be developed in more detail at WeITAG Stage Two and Three; and
- **Chapter 5** recommends **Next Steps** for the study, with reference to appropriate work packages and potential delivery arrangements.

2. Strategic Case

2.1. Introduction

This Chapter reviews the Strategic Case for Change within the A40 Carmarthen to St Clears scheme area, providing an understanding of the appraisal area, the current transport patterns and perceived transport problems. It also considers local and strategic planning data to understand future conditions which may exacerbate, or introduce new, transport problems.

In addition to identifying the Strategic Case for Change, this Chapter identifies a set of TPOs that will be used to frame the assessment of long-list options, which will also be identified as part of this Chapter. It is demonstrated within this Chapter that in combination the TPOs address the transport problems identified and achieve the national and local well-being goals.

Further details as to the assessment work undertaken to support this Chapter is provided within the accompanying IAR.

2.2. Appraisal 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 and 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 is the approximately 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.

2.2.2. Traffic Growth

A review of TEMPro (version 7.2) growth factors has identified that traffic growth across Carmarthenshire will be higher than the national average, with the growth being generated at the eastern end of the scheme area (Carmarthen). The analysis indicates that traffic growth at the western end of the scheme area at St Clears is expected to be slightly lower than the national average.

2.2.3. Journeys to Work

Census 2011 data has been interrogated in order to assess the existing journeys to / from work via the A40. As the A40 scheme area acts as the primary vehicular link between Carmarthen and south Pembrokeshire, it is important to consider whether there are any daily traffic patterns, that impact the operation of the road link.

According to the data, there is a reasonably significant demand within the scheme area for eastbound commuting journeys with approximately three thousand commuters recorded. There is a significantly lower demand for westbound commuting journeys, with less than two thousand commuters recorded as travelling to work westbound. On this basis, it is considered that commuting journeys could have a reasonably significant impact on eastbound traffic within the scheme area; however, westbound commuting journeys are considered to have less of an influence on traffic flow within the scheme area, due to the relatively low demand.

In addition to the number of commuting journeys undertaken, the Census 2011 data also provides an indication of the modal split of commuters travelling east or west. The Census 2011 data demonstrates that the vast majority of commuting journeys in the area surrounding the scheme area are made by the private car. It is therefore considered that there is currently a significant reliance on the private vehicle for work journeys eastbound and westbound through the scheme area.

2.3. Policy Context

The policy documents considered of relevance to this WeITAG Study include:

- National:
 - Welsh Language Act (1993)¹;
 - Planning Policy Wales (Edition 10, December 2018)²;
 - Technical Advice Note 18: Transport³;
 - Wales Transport Strategy⁴;
 - National Transport Finance Plan 2018 Update⁵;
 - Prosperity for All: Economic Action Plan⁶;

¹ Welsh Government (1993) *Welsh Language Act*. Available online:
<http://www.legislation.gov.uk/ukpga/1993/38/contents>

² Welsh Government (2018) *Planning Policy Wales*. Available online:
<https://gov.wales/sites/default/files/publications/2018-12/planning-policy-wales-edition-10.pdf>

³ Welsh Government (2007) *Planning Policy Wales – Technical Advice Note 18: Transport*. Available online:
<https://gov.wales/sites/default/files/publications/2018-09/tan18-transport.pdf>

⁴ Welsh Government (2008) *The Wales Transport Strategy*. Available online:
<https://gov.wales/sites/default/files/publications/2017-09/wales-transport-strategy.pdf>

⁵ Welsh Government (2018) *National Transport Finance Plan 2018 Update*. Available online:
<https://gov.wales/sites/default/files/publications/2019-05/national-transport-finance-plan-2018-update.pdf>

⁶ Welsh Government (2017) *Prosperity for All: Economic Action Plan*. Available online:
<https://gov.wales/sites/default/files/publications/2019-02/prosperity-for-all-economic-action-plan.pdf>

- Prosperity for All: A Low Carbon Wales⁷;
- Active Travel (Wales) Act⁸;
- Well-being of Future Generations (Wales) Act⁹; and
- Transport Fit for Future Generations¹⁰.
- Regional:
 - Swansea Bay City Deal¹¹; and
 - Joint Transport Plan for South West Wales (2015-2020)¹².
- Local:
 - Carmarthenshire Local Development Plan 2006-2021¹³.

A review of the relevant policy indicates that current policy trends emphasise the importance of transport improvement schemes to deliver delay and congestion benefits, without compromising the premise of sustainable development. On this basis, any delay or congestion benefits need to be considered in the context of improvements to public transport and active travel infrastructure, to ensure that use of the private car is not unduly prioritised above other modes of travel. It is noted that the Joint Transport Plan for South West Wales, sets the aspirations within the region for significant public transport improvements through the delivery of the South West Wales Metro scheme.

It is considered that all policy documents are important in understanding the context of transport problems within the scheme area and have therefore been reviewed as part of the accompanying IAR. Notwithstanding, it is considered that the following two policy documents are of particular importance to understanding the context of the scheme area and development of potential interventions within the WeITAG framework.

2.3.1. **Well-Being of Future Generations (Wales) Act (2015)**

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 2-1** and set out as follows:

⁷ Welsh Government (2019) *Prosperity for All: A Low Carbon Wales*. Available online: https://gov.wales/sites/default/files/publications/2019-06/low-carbon-delivery-plan_1.pdf

⁸ Welsh Government (2013) *Active Travel (Wales) Act*. Available online: <http://www.legislation.gov.uk/anaw/2013/7/contents/enacted>

⁹ Future Generations Commissioner for Wales (2015) *Well-being of Future Generations (Wales) Act 2015*. Available online: <https://futuregenerations.wales/about-us/future-generations-act/>

¹⁰ Future Generations Commissioner for Wales (2018) *Transport Fit for Future Generations*. Available online: <https://futuregenerations.wales/wp-content/uploads/2018/11/20180912-Transport-Fit-for-Future-Generations-C-1.pdf>

¹¹ Swansea Bay City Deal (2017). Available online: <https://www.swanseabaycitydeal.wales/>

¹² Swansea Council (2015) *Local Transport Plan*. Available online: <https://www.swansea.gov.uk/localtransportplan>

¹³ Carmarthenshire County Council (2014) *Local Development Plan 2006-2021*. Available online: <https://www.carmarthenshire.gov.wales/home/council-services/planning/planning-policy/local-development-plan-2006-2021/#.XeZqQuj7SF4>

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.

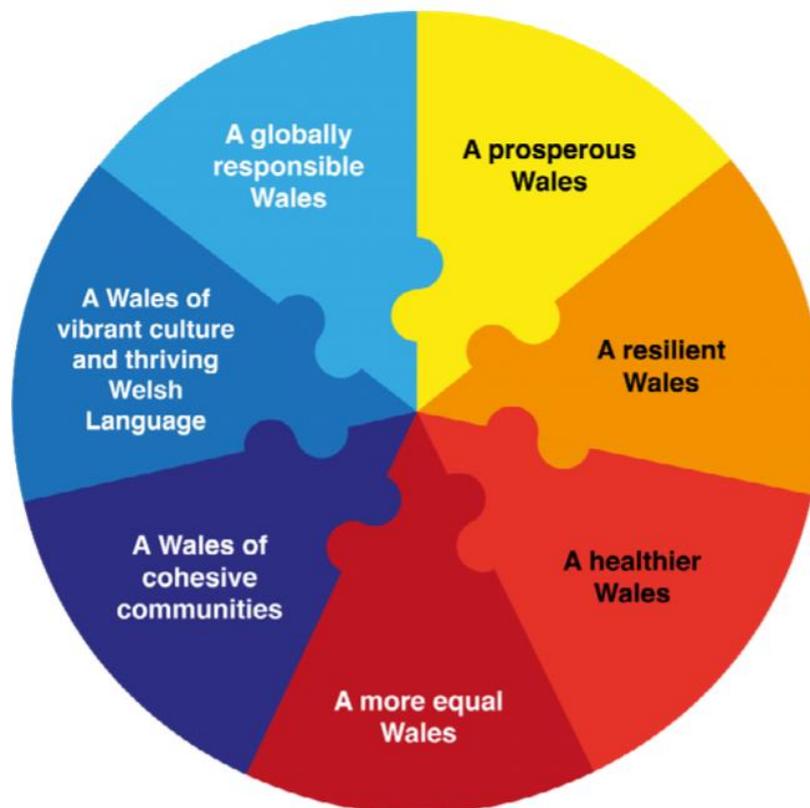


Figure 2-1 Well-being of Future Generations (Wales) Act – National Well-being Goals

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 Plan¹⁴, 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.

¹⁴ 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>

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.

2.3.2. Carmarthenshire Local Development Plan 2006-2021

The Local Development Plan (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.

Carmarthen

Within the current adopted LDP, there are two strategic development allocations located in Carmarthen, both of which are of relevance to the scheme area. The strategic development allocations in Carmarthen are illustrated in **Figure 2-2** and summarised as follows:

- GA1/MU1 – Mixed-Use:
 - West Carmarthen – residential (1,100 units), employment, community facilities and amenities, inclusive of construction of a new link road between the A40 and College Road.
- GA1/MU2 – Mixed-Use:
 - Pibwrlwyd – employment, leisure and education uses.

In addition to the strategic development allocations, there are also a range of residential, employment and leisure allocations in Carmarthen. It is anticipated that these development allocations could increase traffic demand along the scheme area in the future.

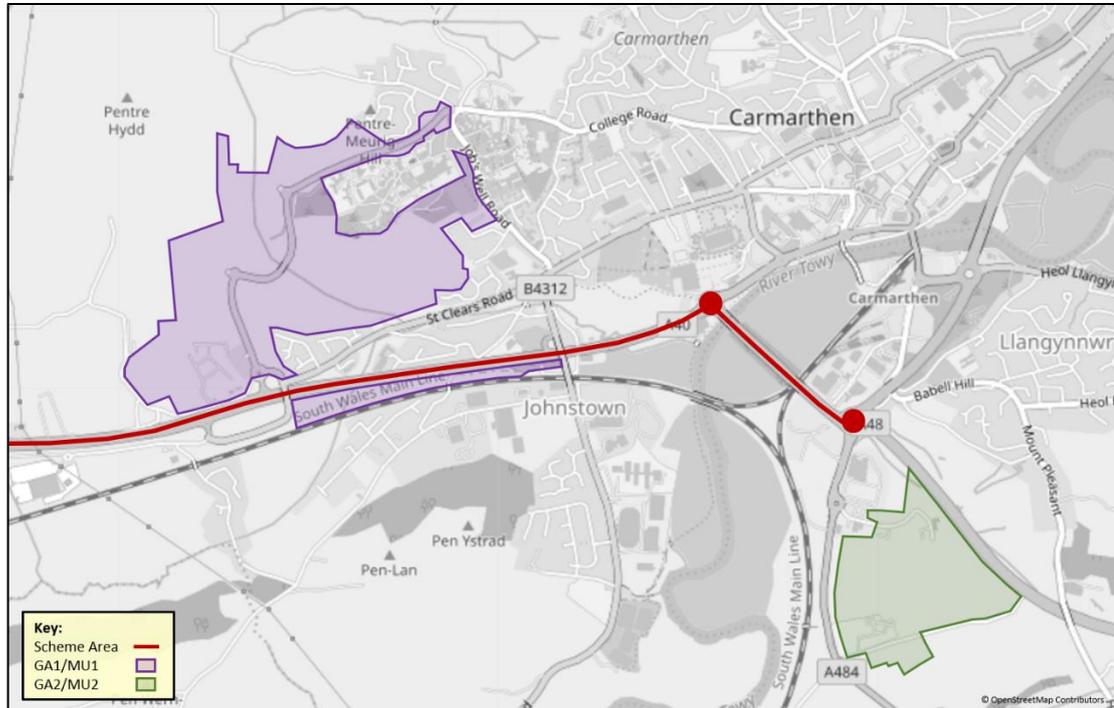


Figure 2-2 Strategic Development Allocations – Carmarthen

St Clears

In addition to the significant number of development allocations in Carmarthen at the eastern end of the scheme area, there are a number of minor LDP allocations located at the western end in St Clears.

Although it is noted that none of the St Clears allocations include alterations to the layout of the A40, the allocations could increase traffic demand at the western end of the scheme area. Due to the location of St Clears within a reasonable commuting distance to Carmarthen, it is also likely that a number of the new trips from the residential allocations will travel to / from Carmarthen for work purposes; increasing traffic demand along the length of the scheme area.

The total quantum of development associated with the allocations are as follows:

- Residential – 279 dwellings;
- Employment – 1.56 ha of B1 or B8 land use; and
- Mixed-Use – employment (0.36 ha), community, retail and specialist residential uses (use classes A1, B1, C2, C3 & D1) together with associated highway works, car and cycle parking, servicing and other ancillary uses and activities.

Bancyfelin and Llangynog

There are two additional allocations of note located in Bancyfelin and Llangynog, which could increase the potential for movements to / from some of the minor arms within the scheme area. The Bancyfelin and Llangynog LDP allocations are summarised as follows:

- Bancyfelin:
 - SC15/h1 – 23 dwellings; and
- Llangynog:
 - SC15/h2 – five dwellings.

2.4. The Transport Problem (Case for Change)

2.4.1. Background Reports

A number of studies have previously been undertaken considering a range of issues of relevance to this section of the A40; all of which have been reviewed as part of the accompanying IAR.

A40 Meidrim Junction Improvement (2017)

A study investigating safety improvement options at the Meidrim junction (J14) and the associated Bancyfelin (J19) junction to the west was undertaken by Atkins. The safety study is in addition to a lighting scheme that was implemented 15 years ago to improve driving conditions in darkness, with a view to reducing safety risk at the junctions.

In order to address the safety and operational concerns identified, a range of improvement options were considered and assessed. It was identified that three potential options (Do-Minimum, Do-Something or Do-More) could go some way to addressing the existing safety and operational concerns identified at both the Meidrim (J14) and Bancyfelin (J19) junctions.

In addition to the A40 Meidrim Junction Improvement (2017) study, a revised report was issued considering a westbound on / off slips arrangement at the Sarnau overbridge to enable the removal of all right-turn movements at the Meidrim (J14) and Bancyfelin (J19) junctions. Following a review of the additional options, it was considered that the engineering constraints and challenges relating to the options are significant and therefore the Sarnau options were not considered as proportionate to the issues identified.

A40 Bancyfelin to St Clears Shared-Use Path (2018)

The A40 Bancyfelin to St Clears Shared Use Path (SUP) study investigated options for improvements to active travel along the A40 between Bancyfelin and St Clears. The study outlines that improvements to the active travel infrastructure between Bancyfelin and St Clears could increase demand for active between the two settlements, increasing the number of trips made by sustainable modes.

The report recommended that the preferred alignment of a SUP between Bancyfelin and St Clears would be along the westbound carriageway verge (southern side of the A40). The recommended alignment of the Bancyfelin to St Clears SUP is illustrated in **Figure 2-3**.

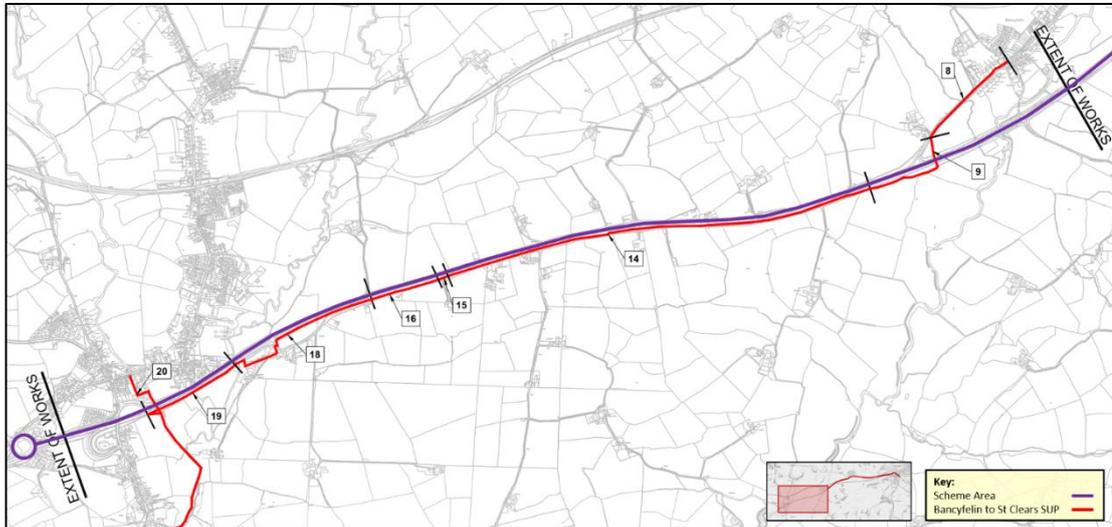


Figure 2-3 Potential Bancyfelin to St Clears SUP Route

Safety and Speed Limits Review (2019)

Existing road safety and speed limit concerns within the scheme area have been investigated as part of the Welsh Government's nationwide Safety and Speed Limit Review. The review considered existing constraints along the trunk road across Wales, which included stakeholder correspondence, before providing a recommendation as to the type of proposal that could mitigate any identified issues.

A range of proposals have been identified for further consideration, as follows:

- Signalisation of the Pont Lesneven Roundabout (J2);
- Introduction of a 30-mph speed limit on Pont Lesneven;
- Improvements to the Johnstown Slips (J4);
- Improved visibility at the Private Access (J9) junction;
- Prevention of heavy-duty vehicle (HDV) parking on the boundary of the A40 at the Forge Restaurant, Lodge and Filling Station (J29b);
- Improved signage at the pedestrian crossing in the vicinity of the Pentre Road Slip (J37); and
- Review of speed limit signage on A40 West approach to the St Clears Roundabout (J41).

St Clears Rail Station 'Stage Two' Assessment (2019)

The Welsh Government has been progressing a range of rail infrastructure projects, so that funding can be obtained from the UK Government when the opportunity occurs. In line with the National Transport Finance Plan (RI10), the feasibility of the St Clears Railway Station has been investigated, with a recommendation that the proposal is further considered as part of a WeITAG Stage One assessment.

The location of the proposed St Clears Railway Station, in the context of the scheme area, is provided in **Figure 2-4**.



Figure 2-4 Proposed St Clears Railway Station Location

2.4.2. Highway Network

Within the scheme area, the A40 is an all-purpose two-lane dual carriageway (D2AP). The cross-section broadly consists of the standard components of a D2AP road¹⁵, although it is unlit in places.

There is a total of 41 junctions located within the scheme area, as listed in **Table 2-1**, which can be broadly characterised as:

- Three large at-grade roundabouts;
- Three grade-separated junctions;
- Four at-grade slip road junctions; and
- 31 at-grade minor road junctions¹⁶.

¹⁵ As presented within Figure 2.1.1N1e in CD127 (DMRB 2020). Note, no detailed checks of whether the carriageway measurements are to standard have been undertaken at this stage.

¹⁶ Minor road junctions refer to: J3, J6-J9, J11, J13-J29a, J30-J36 and J38-J39b.

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 ¹⁷	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 ¹⁸	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

¹⁷ 'Private Access' refers to a minor road junction that provides access to private property.

¹⁸ 'Agricultural Access' refers to junctions where a minor access (typically via a gated access) is provided to a field directly from the A40.

The locations of the junctions within the scheme area are illustrated in **Figure 2-5**.

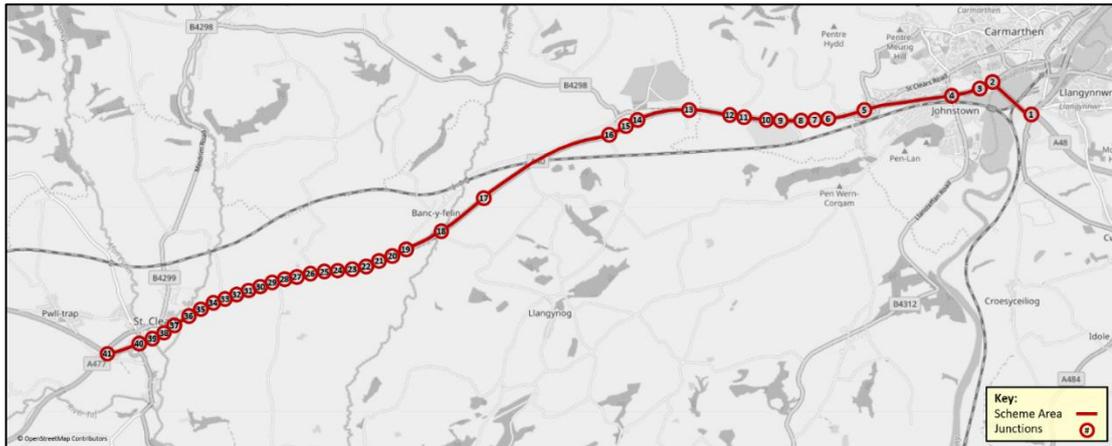


Figure 2-5 Scheme Area – Locations of Junctions

There is a significant concentration of junctions to the west of Bancyfelin, particularly between the Bancyfelin (J19) and High Street Slips (J40) junctions. In addition to the concentration of junctions in the western area of the scheme area, there is also a concentration of junctions directly to the west of Carmarthen between the Market Hall Vets (J6) and Tenby Road Filling Station (J12) junctions.

2.4.3. 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 a 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.

It is considered that due to the location of the A40, there are limited available alternative routes between Carmarthen and St Clears. Due to the presence of the river Cywyn and river Towy estuaries to the south of the scheme area, there are no classified road routes between Carmarthen and St Clears to the south of the A40.

2.4.4. Walking and Cycling

Health Trends

According to Public Health Wales¹⁹, 60% of adults and over 25% of children are currently overweight or obese in Wales.

It is considered that this existing issue is exacerbated by a lack of physical activity, with only 53.7% of people in Wales reporting to undertake more than the recommended 150 minutes of physical activity in a week. To increase physical activity, it is considered that a comprehensive, safe and convenient active travel network can facilitate a modal shift towards active travel modes, which has the benefit of increasing physical activity. This WeITAG Stage One study has been undertaken within this context.

Existing Infrastructure Provision

The existing active travel infrastructure provision within the scheme area is shown in **Figure 2-6**.

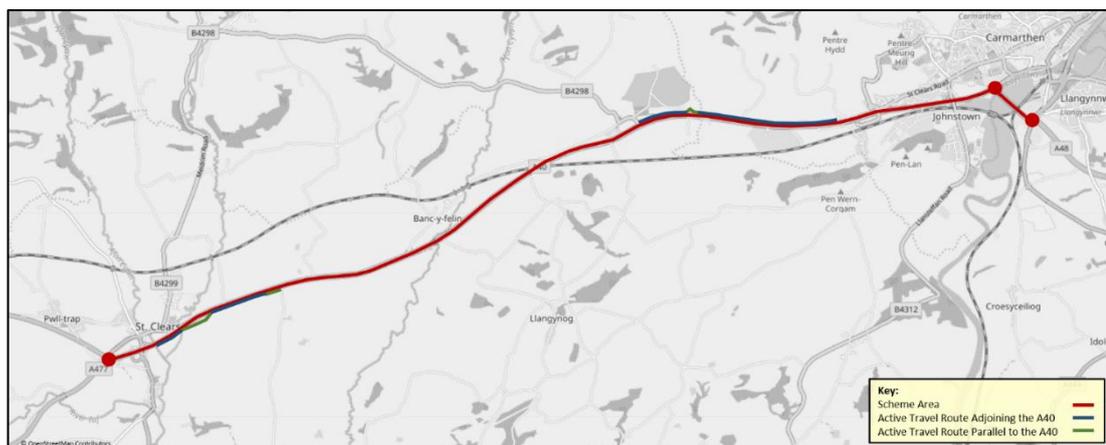


Figure 2-6 Existing Active Travel Infrastructure Provision

Within the scheme area, there are two active travel routes that adjoin or travel parallel to the A40. The eastern route is a 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.

¹⁹ Public Health Wales (2019) *Obesity in Wales*. Available online: http://www.publichealthwalesobservatory.wales.nhs.uk/sitesplus/documents/1208/ObesityInWales_Report2018_v1.pdf

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 (NCN), which is shown in **Figure 2-7**. The cycleway runs from the Private Access / Eglwys Llanfihangel Abercowin (J28) junction to in the vicinity of the High Street Slips (J40).

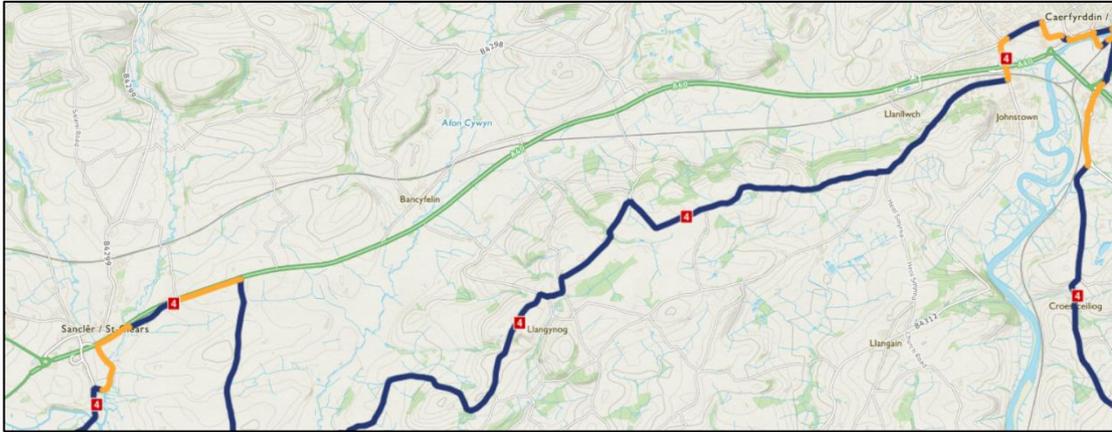


Figure 2-7 National Cycle Network – Route 4 (Courtesy of Sustrans²⁰)

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

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

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 Integrated Network Map (INM), which sets out CCC's 15-year vision for improving walking and cycling routes across the Authority.

²⁰ Sustrans (2020) *Map of the National Cycle Network*. Available online: <https://www.sustrans.org.uk/national-cycle-network/>

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 there 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 2-2 INM Active Travel Routes

It is evident from the CCC INM 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.

Public Rights of Way

In addition to the existing provision of active travel routes, there are two occurrences where public rights of way (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 is not considered that crossing provision at either PRoW within the scheme area is suitable, although it is noted that anecdotal evidence from the site visit undertaken suggests that the second PRoW is currently utilised by pedestrians. It is however noted that no collisions have been recorded between vehicles and pedestrians within the scheme area, as set out within **Section 2.4.7**.

HD 42/17 (Walking, Cycling and Horse-Riding Assessment and Review

Further consideration for the active travel provision and existing PRoW within the scheme area is provided in the HD42/17 ('Walking, Cycling and Horse-Riding Assessment and Review')²¹ which is appended to the IAR.

2.4.5. Public Transport

Bus

There is a total of eight designated bus stops within the scheme area, with six westbound bus stops and two eastbound bus stops. The locations of the bus stops are illustrated in **Figure 2-8**.

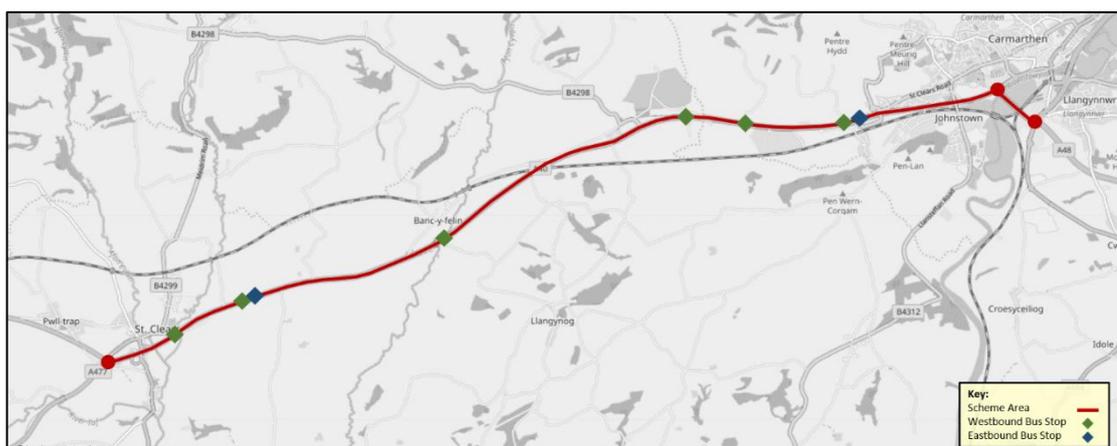


Figure 2-8 Location of Bus Stops

²¹ It is noted that a later version of the guidance has been issued (CC142); however, it is understood that Welsh Government are yet to formally adopt this guidance and therefore HD42/17 has been utilised.

Bus Infrastructure

Within the scheme area, a total of three (two westbound and one eastbound) bus stops include the provision of dedicated bus laybys, with an additional two bus stops (one westbound and one eastbound) 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.

The remaining bus stops (three westbound) are located adjacent to the A40, without any parking or bus layby. It is however 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 significant safety concern if buses were to stop in these locations.

Bus Services

The highest frequency of bus services within the 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 (Pensarn Roundabout (J1) to Pont Lesneven Roundabout (J2)) and areas to the west of the town (Pont Lesneven Roundabout (J2) to Johnstown Slips (J4) / Travellers Rest (J5) junction).

Of the services at the eastern end of the scheme area, the existing park and ride service (PR1) provides a half hourly service along the scheme area from the park and ride site located adjacent to the Travellers Rest (J5) junction. In addition to the PR1 service, the X11 service is a half hourly service between Carmarthen and Llanelli. It is however noted that neither the PR1 or X11 services stops within the scheme area, as there are no bus stops located along the A40 between the Pensarn Roundabout (J1) and Travellers Rest (J5) junction.

To the west of the Travellers Rest (J5) junction, 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 consultation that the westbound 222 service used to access 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 (J19) junction, 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 public transport services operating within the adjoining rural settlements of Bancyfelin and Sarnau.

Rail

Carmarthen Railway Station is the nearest railway station to the scheme area and is located approximately 500m to the north of the Pensarn Roundabout (J1). The station is managed by Transport for Wales (TfW) and provides access to regular services including the Milford Haven – Manchester line which calls at popular destinations such as Cardiff to the east, with up to two services per hour.

In addition to the existing provision, the Welsh Government is currently investigating the opportunity for developing a new railway station at St Clears. It is considered that the railway station provides the opportunity to support a modal shift away from the private car for trips to / from Carmarthen and to the wider area. It is considered that any modal shift towards Carmarthen could reduce traffic demand within the scheme area.

2.4.6. Laybys

In addition to the bus laybys described in **Section 2.4.5**, there are a total of 10 westbound and eight eastbound laybys located within the scheme area. The locations of the laybys within the scheme area are illustrated in **Figure 2-9**.



Figure 2-9 Location of Laybys

A review of the laybys within the scheme area has been undertaken and is presented in full within the IAR. It has been identified that the majority of the existing facilities do not adhere to the current guidance for new laybys, as set out within the Design Manual for Roads and Bridges (DMRB) CD169²² document, due to a lack of a provision of a segregation island.

²² 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/dmr/vol6/section3/CD%20169%20The%20design%20of%20lay-bys%20-web.pdf>

This being said, it is noted that laybys WL5, EL4 and EL8 provide a segregation island and are therefore the correct layout for this road type. It is however noted that further investigation is required to understand the suitability of the laybys, specifically in the context of whether the layby is of suitable width and with acceptable taper lengths on access / egress.

2.4.7. Collision Data

Overview

Collision data has been obtained for the scheme area, covering the most recent five-year period from September 2014 to August 2019. In order to assist in the interpretation of the collision data, three areas of analysis have been derived for assessment purposes, as shown in **Figure 2-10** and summarised as follows:

- Eastern Area – Pensarn Roundabout (J1) to Market Hall Vets Junction (J6);
- Central Area – Market Hall Vets Junction (J6) to High Street Slips (J40); and
- St Clears Roundabout – High Street Slips (J40) to St Clears Roundabout (J41).

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. No damage only hot spots have been identified within the scheme area in consultation with the SWTRA networks team.



Figure 2-10 Collision Data – Areas of Analysis

A detailed review of the collision data is presented within the IAR, with a summary provided as follows. The total recorded collisions within the scheme area is provided in **Table 2-3**.

Area of Analysis	Severity			Total
	Slight	Serious	Fatal	
Eastern Area	28	0	0	28
Central Area	21	10	2	33
St Clears Roundabout	3	1	0	4
Total Scheme Area	52	11	2	65

Table 2-3 Collision Data Summary

Eastern Area

The collision data has identified that there is a significant number of collisions recorded within the Eastern Area of analysis. It is however noted that all collisions within the area resulted in slight casualties.

Although all recorded collisions within the Eastern Area were slight, there is a significant cluster of collisions recorded at both the Pensarn (J1) and Pont Lesneven (J2) Roundabouts, as well as on Pont Lesneven linking the two junctions. The cluster of collisions in this location is considered to be applicable to the large traffic demand for this section of the scheme area, particularly during peak times.

There are only three other slight collisions recorded away from the Pont Lesneven cluster of collisions within the Eastern Area, with all three collisions located apart from another. These collisions are not considered to identify any significant safety concerns.

It is noted that one of the slight collisions at the Pont Lesneven Roundabout (J2) involved a cyclist, which is the only collision that involved an active travel user within the total scheme area. The collision occurred when a vehicle entered the roundabout from the A40 West arm of the junction, colliding with a cyclist who was already on the circulatory. This being said, it is not considered that this collision suggests a significant active travel safety concern at the Pont Lesneven Roundabout (J2).

Central Area

The data has identified that the collisions recorded within the Central Area are relatively dispersed, with the exception of small notable clusters of collisions at the following locations:

- Ffoshelig Coaches / Agricultural Access (J11) to Tenby Road Filling Station (J12) – one slight, one serious and one fatal collision;
- Near Railway Overbridge – two slight and two serious collisions; and
- Private Access / Llangynog (J18) to Private Access (J21) – four slight, three serious and one fatal collision.

Fatal Collisions

Two fatal collisions have been recorded within the Central Area section. 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. It is noted that there is no existing street lighting in the vicinity of the fatal collision and therefore, as the collision occurred in darkness, the lack of lighting could have been a contributing factor in the fatality.

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. It is understood that this is a temporary measure, with the suitability of further solutions to be considered as part of this WeITAG study. The temporary signage on the A40 westbound in the vicinity of the Ffoshelig Coaches / Agricultural Access (J11) junction is shown in **Figure 2-11**.



Figure 2-11 Temporary Signage – A40 Westbound

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 Central Area, it is noted that there is a cluster of collisions located 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.

St Clears Roundabout

As only a total of four collisions were recorded at the St Clears Roundabout (J41), it is not considered that there is an existing significant safety concern at the junction.

Collision Rate

The collision rate used in the Department for Transport (DfT) Cobalt software²³ for an A-road dual carriageway, adjusted for the assessment years, translates to a rate of 7.8 per one hundred million vehicles kilometres (HMVKM).

A review of the collision data has identified that the collision rate across the entire scheme area (7.3) is slightly lower than the Cobalt rate for this road type, meaning that there are four less collisions within the scheme area over five years than would be expected by Cobalt. This being said, it is noted that at Pont Lesneven (J1-J2) and in the vicinity of the Bancyfelin (J18-J21), the collision rate is 40.2 and 18.8, respectively; which is significantly larger than estimated by Cobalt. This suggests that at these particular locations the potential for collisions is significantly larger than a comparable road link elsewhere.

It should also be noted that the collision data does not include the number of near misses experienced within the scheme area.

²³ Cost and Benefit to Accidents – Light Touch, used within business case development to identify the economic cost relating to collisions within a defined scheme area. Available online:
<https://www.gov.uk/government/publications/cobalt-software-and-user-manuals>

Seasonality

The collision data suggests that there is a slight increase in collision rates during the summer months (52%) compared to the winter, across the total scheme area. This suggests that the seasonal increase in traffic demand, applicable to tourist traffic, increases the potential for collisions within the scheme area, as it would be typically expected that collision rates are higher during the winter months due to increased periods of darkness and more adverse driving conditions.

Of particular note, the proportion of collisions within the Eastern Area is significantly higher during the summer months, with 68% of all collisions within the area of analysis occurring during the summer. This suggests that this section of the scheme area is particularly adversely impacted by the increase in traffic during the summer months attributable to tourist traffic.

Cross Hands Roundabout to Pont Abraham Roundabout Review

Although not directly adjoining the scheme area, the section of the A48 between the Cross Hands and Pont Abraham Roundabouts links the scheme area to the M4 to the east of Carmarthen.

A range of road safety measures, including restrictions to some cross-carriageway manoeuvres through closures of gaps in the central reservation, were undertaken on the A48 between the Pont Abraham and Cross Hands Roundabouts in 2012. It is understood from stakeholder feedback that the implemented measures have had a beneficial impact on the road safety record along the route.

In order to assess the impact of the measures in further detail, the collision rate per HMVKM before and after the implemented measures has been calculated. The collision rate calculations suggest that the measures have led to a reduction of approximately 25% in the number of collisions per HMVKM. On this basis, it is considered that the road safety measures implemented on the A48 between Pont Abraham and Cross Hands have improved road safety along the route.

2.4.8. *Electric Vehicles*

It is understood that both the Welsh Government and CCC are developing electric vehicle strategies, to encourage and facilitate further usage of electric vehicles. On this basis, a review has been undertaken of the electric vehicle charging provision in the vicinity of the scheme area.

The 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.

2.4.9. **Environmental Considerations**

In order to identify any environmental constraints within the scheme area, consideration has been given to:

- Air Quality;
- Noise;
- Flood Zones;
- Heritage Assets; and
- Environmental Sensitivity.

The following environmental constraints have been identified:

- There are five noise priority areas located within the scheme area, with the three most prominent areas between the Johnstown Slips (J4) and Travellers Rest (J5) junction, the Tenby Road Filling Station (J12) and Golf Club / Private Access (J13) junctions and the Private Access / Eglwys Llanfihangel Abercowin (J28) and Waunbricks (J34) junctions, respectively;
- A significant proportion of the scheme area is located within designated flood zones, with the most prominent sections within flood zones on the Pont Lesneven and in the vicinity of Bancyfelin;
- There are two listed buildings that have been identified as adjoining the scheme area at the: Golf Club / Private Access (J13) and Private Access / Eglwys Llanfihangel Abercowin (J28) junctions, respectively;
- The River Towy, which flows under the Pont Lesneven, is designated as a Site of Special Scientific Interest (SSSI), while there is an SSSI located on the northern boundary of the A40 between the Tenby Road Filling Station (J12) and the Golf Club / Private Access (J13) junctions; and
- A conservation area borders the eastern side of the Pont Lesneven, while the St Clears conservation area borders the southern extent of the High Street Slips (J40) junction.

It should be noted that the scheme area does not form part of any existing air quality management area (AQMA), while it is also noted that there are currently no non-automatic monitoring sites within the scheme area²⁴. It is however considered that an increase in traffic demand within the scheme area could potentially affect air quality along the A40.

²⁴ Carmarthenshire County Council (2018) 2018 Air Quality Progress Report. Available online: <https://www.carmarthenshire.gov.wales/media/1219553/2018-annual-progress-report-ccc.pdf>

It is understood that, whilst not currently adopted, consideration will need to be given to relevant DMRB guidance documents on the requirements for an environmental assessment as the WeITAG process develops²⁵; particularly noting LA105 (Air Quality), LA111 (Noise and Vibration), and LA114 (Climate Change). This being said, it is considered that the TPOs are an effective assessment framework at this stage of WeITAG, as there is currently a significant level of uncertainty relating to the potential interventions, which represent a sufficient proportional assessment in accordance with DMRB LA101.

2.4.10. Vehicle Traffic Demand

In order to understand the existing traffic demand within the scheme area, the following sources of data have been interrogated:

- Trafficmaster – Journey Time and Speed Data;
- DfT – Annual Average Daily Traffic (AADT) and HDV Data;
- Traffic Wales – Permanent Traffic Counters; and
- Traffic Survey Data (2019).

Trafficmaster

In order to investigate vehicle journey time variation on the strategic highway network within and surrounding the scheme area, Trafficmaster data, which is a national dataset that provides bi-directional speeds from recorded GPS data, has been obtained from the Welsh Government for the period December 2015 – December 2016. This year of data is the latest available from the Welsh Government due to licensing.

The Trafficmaster plots provide a visual representation of ‘acceptable speeds’, which is the degree to which vehicles travel at the typical speed of a road based on an off-peak scenario. It is therefore considered that congestion is likely to be present if the proportion of vehicles travelling at an acceptable speed is below 75%.

The Trafficmaster data was interrogated to obtain acceptable speeds plots for: Winter (October 1st – March 31st), August and August Bank Holiday Weekend (Friday, August 26th – Monday, August 29th) scenarios.

It was noted that during the Winter scenario, some delay occurs in proximity to Carmarthen, within the scheme area; however, there is no recorded delay to the west of Carmarthen, with the proportion of acceptable speeds recorded at over 85%.

²⁵ Standards for Highways, Design Manual for Roads and Bridges (2019) *Sustainability and Environment*. Available online: https://www.standardsforhighways.co.uk/dmrb/search?discipline=SUSTAINABILITY_AND_ENVIRONMENT

Although the August Trafficmaster plots show that there is no significant increase in delay during the typical weekday AM and PM peak hours, compared to the Winter scenario, there does appear to be a significant increase in delay on the A48 approach to the Pensarn Roundabout (J1), during the Friday PM peak scenario. Similar to the Friday PM peak scenario, it is evident that there is an increase in delay experienced on the strategic highway network during the Sunday peak in August; particularly on the A48 arm of the Pensarn Roundabout (J1); however, different to the Friday PM peak scenario, it is noted that there are occurrences of less than 85% travelling at the acceptable speeds in an eastbound direction, within the scheme area near Carmarthen. This corresponds with the primary direction of tourist traffic during August, suggesting that tourist traffic has an impact on delay within the scheme area.

Further to the August scenario, the August Bank Holiday Friday PM and Monday peak scenarios, as illustrated in **Figure 2-12**, identify additional delay on the strategic highway network; namely on the A48 arm of the Pensarn Roundabout (J1) and the A40 West arm of the Pont Lesneven Roundabout (J2), respectively. In addition to these areas of delay, the Monday peak August Bank Holiday weekend scenario demonstrates significant delay on the A477 approach to the St Clears Roundabout (J41) at the western end of the scheme area.

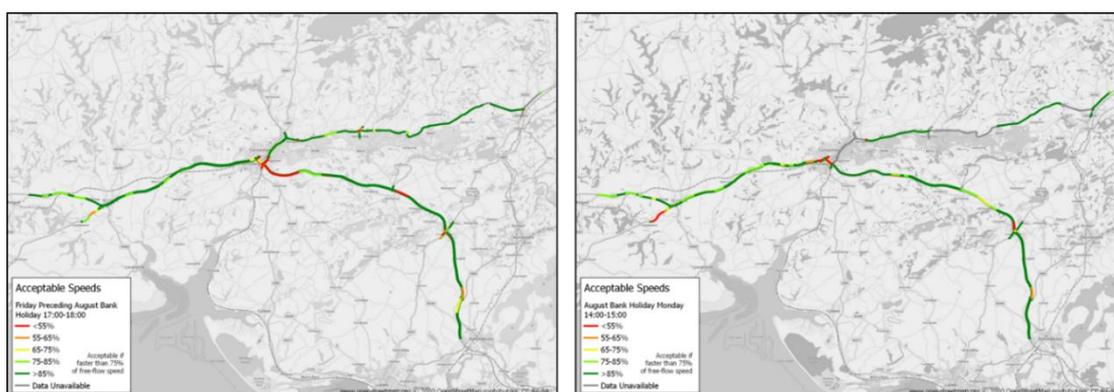


Figure 2-12 Trafficmaster – August Bank Holiday Weekend

Therefore, following a review of the Trafficmaster data, it is considered that the scheme area experiences a significant increase in seasonal traffic demand, applicable to tourist traffic, that increases vehicle delay on the strategic highway network.

Department for Transport

The DfT traffic data suggests that there has been a minor increase in traffic demand within the scheme area over the latest five years of available data.

It is noted that the traffic demand at the eastern end of the scheme area is significantly larger than at the western end of the scheme area. This is considered attributable to the eastern end of the scheme area adjoining Carmarthen, which is the largest residential and employment settlement in the area. In contrast, the western end of the scheme area is more typical of a rural dual carriageway, with only minor rural settlements adjoining the A40 in this location.

In contrast to the traffic demand, the %HDV is typically larger in the western end of the scheme area. It is considered that the larger %HDV is due to the lower baseline traffic demand; however, the larger %HDV suggests that a large proportion of HDVs travel along the entirety of the scheme area, as oppose to exiting the A40 at the junctions within the scheme area. This is considered to be partly attributable to the presence of the strategic ports and large industrial developments in Pembrokeshire.

Traffic Wales

In order to understand how traffic varies across the year within the scheme area, the following information has been extrapolated from the Traffic Wales data:

- **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 2-13**.

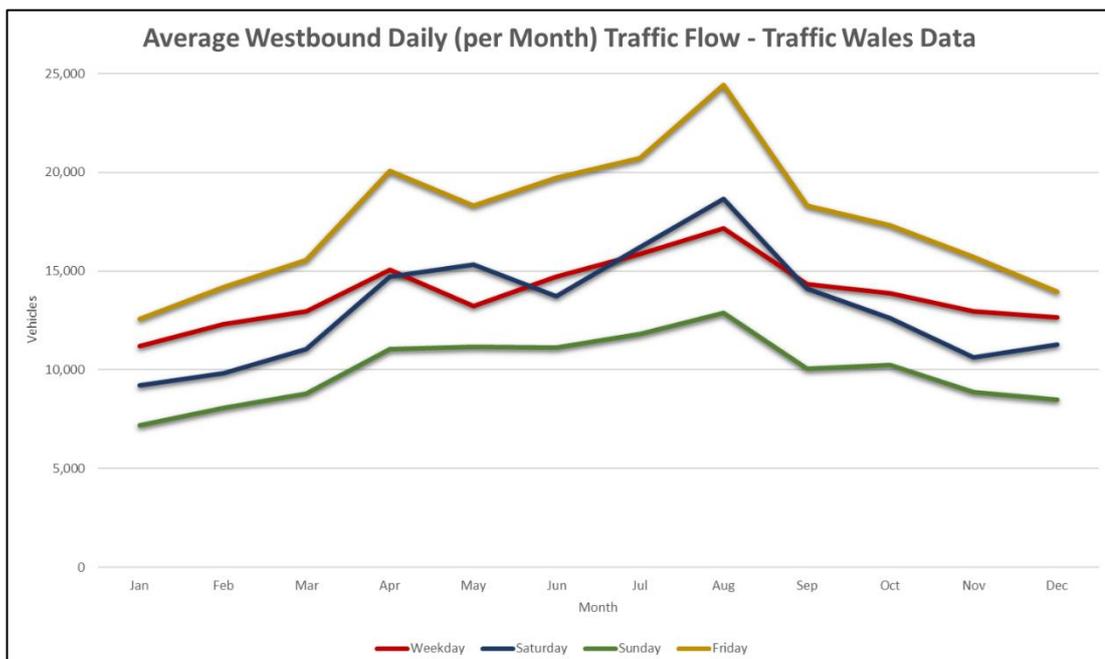


Figure 2-13 Traffic Wales – Daily Traffic by Month

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 has a significant impact on traffic demand within the scheme area.

Within the dataset, it is also clear that the daily traffic demand on Fridays is higher in every month compared to all other scenarios. It is noted that there is a less significant increase in traffic demand on Fridays during less prominent tourist months (namely December – March), while the difference is most significant in the summer months (April – September). As the dataset considers the westbound traffic flow, which is what would be expected to be the prominent direction for tourist traffic demand on Fridays, it is clear that tourist traffic has a significant impact on increasing traffic demand within the scheme area.

Diurnal Traffic Profile

The average diurnal traffic profiles²⁶ calculated from the Traffic Wales data are illustrated in **Figure 2-14**.

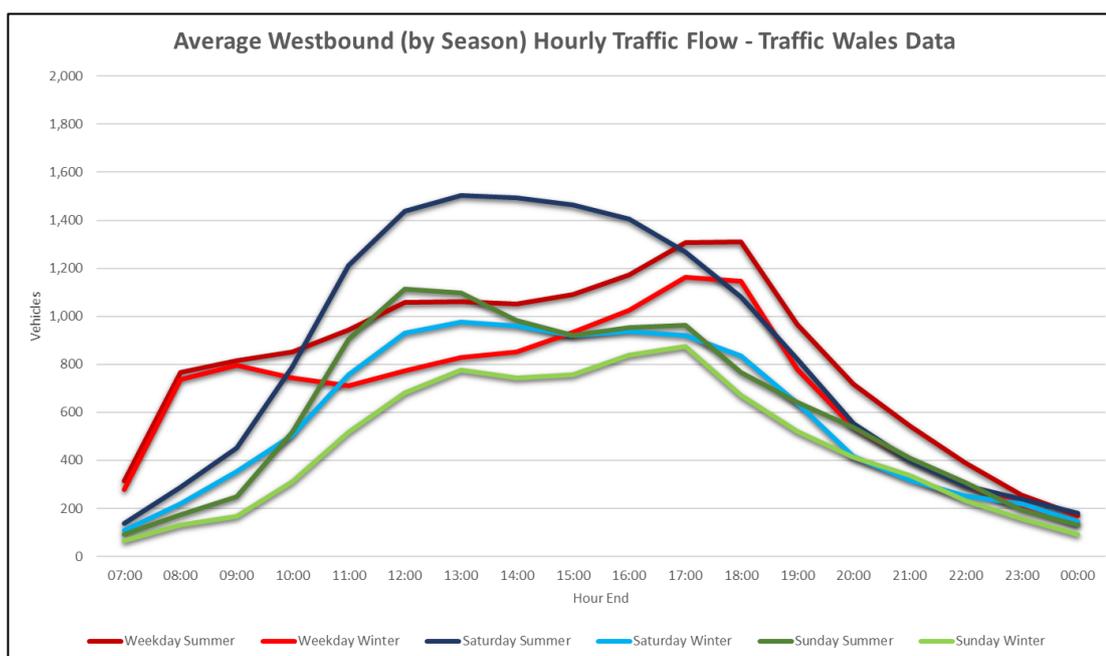


Figure 2-14 Traffic Wales – Diurnal Traffic Profiles

²⁶ 'Summer' refers to April – September, while 'Winter' refers to October – March.

The traffic demand across the day is higher every hour in the summer months compared to the winter months, demonstrating a significant impact of tourist traffic on traffic 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.

Traffic Survey Data

The traffic survey obtained link count data for the period December 3rd – December 9th, 2019, at the following locations:

- **Link 1** – at the Johnstown Slips (J4);
- **Link 2** – between the Travellers Rest (J5) and Market Hall Vets (J6) Junctions; and
- **Link 3** – between the Coast to Coast Caravans (J36) and Pentre Road Slip (J37) Junctions.

It is acknowledged that the traffic surveys have been undertaken during a non-neutral month (TAG Unit M1.227); however, project delivery timescales required the undertaking of traffic surveys during December. As demonstrated within the 'Trafficmaster' and 'Traffic Wales' sections, the traffic flows are typically higher during the summer months (attributable to tourist traffic) within the scheme area and therefore the data presented within this section should not be considered as a worst-case assessment. It is however noted that the traffic data for December will have captured vehicles travelling to / from Carmarthen for retail purposes. It is therefore considered that the traffic survey data is appropriate to inform the development of the A40 Carmarthen to St Clears WeITAG Stage One study.

Daily Traffic

The daily traffic and %HDV recorded at each of the link counts is summarised in **Table 2-4**.

²⁷ Department for Transport (2014) *TAG Unit 1.2 – Data Sources and Surveys*. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/427119/webtag-tag-unit-m1-2-data-sources-and-surveys.pdf

Scenario	Direction	Link 1		Link 2		Link 3	
		Vehicles	%HDV	Vehicles	%HDV	Vehicles	%HDV
Average Weekday	Eastbound	14,065	8.3%	14,384	8.6%	13,471	9.2%
	Westbound	19,845	7.0%	15,507	7.9%	13,512	9.0%
	<i>Total</i>	<i>33,910</i>	<i>7.6%</i>	<i>29,891</i>	<i>8.2%</i>	<i>26,983</i>	<i>9.1%</i>
Saturday	Eastbound	11,792	3.8%	11,908	4.1%	11,041	4.3%
	Westbound	15,805	2.8%	13,016	3.2%	11,297	3.4%
	<i>Total</i>	<i>27,597</i>	<i>3.2%</i>	<i>24,924</i>	<i>3.7%</i>	<i>22,338</i>	<i>3.9%</i>
Sunday	Eastbound	11,073	2.6%	11,259	2.5%	10,511	2.7%
	Westbound	12,698	2.2%	10,334	2.3%	9,078	3.0%
	<i>Total</i>	<i>23,771</i>	<i>2.4%</i>	<i>21,593</i>	<i>2.4%</i>	<i>19,589</i>	<i>2.8%</i>

Table 2-4 Traffic Survey Data – Daily Traffic and %HDV

The link count data demonstrates that traffic flows are typically larger at the eastern end of the scheme area (Link 1) than the western end (Link 3), while the %HDV is typically higher at the western end than the eastern end. This pattern in traffic flows / %HDV reflects the findings of the DfT data interrogation and suggests that the traffic demand is higher in the vicinity of Carmarthen, compared with the more rural area at the western end of the scheme area.

It is also noted that traffic flows are typically lower on a Saturday compared to an average weekday, with Sunday traffic flows recorded lower than the Saturday demand. Within Saturday and Sunday traffic flows, the difference between traffic flows at the eastern and western ends of the scheme area are less pronounced; suggesting that a significant proportion of traffic demand at the eastern end during the weekdays is applicable to local employment-based trips, which are not required on weekends.

In addition, the recorded %HDV is significantly lower on the weekends, with %HDV recorded as typically higher on a Saturday than a Sunday. It is therefore considered that the majority of road-based freight travels through the scheme area on weekdays, as opposed to on weekends.

Impact of Strategic Ports

In order to investigate the impact of the strategic ports on fleeting of HGVs within the scheme area, daily hourly traffic profiles have been extrapolated for each surveyed day²⁸.

²⁸ The HGV diurnal traffic profiles do not include buses, as a significant number of the recorded buses are public services that do not utilise the ferries from the strategic ports.

It is not considered that the fleeting of HGV vehicles has a significant impact on the operation of the scheme area, on the basis that there is no clear significant increase in HGVs commensurate with the arrival and departure of ferries at / from the strategic ports. It is also pertinent to note that the arrival and departure times of the ferries reduces the potential for a significant increase in HGV demand during the typical peak periods of weekday traffic

Johnstown Slips – Westbound Off-Slip Queueing

Stakeholder feedback has identified that the existing Johnstown Slips (J4) westbound off-slip causes queueing to extend back onto the nearside A40 lane. On this basis, the traffic survey recorded when queueing back occurred from the Johnstown Slips (J4) westbound off-slip to the nearside A40 lane.

The time where queueing back occurred during the AM and PM peak periods is illustrated in **Figure 2-15** and **Figure 2-16**, respectively. The occurrences of queueing back are illustrated with a dot on the timeline and it should be noted that there was no recorded queueing back on the weekend and therefore Saturday and Sunday have been excluded

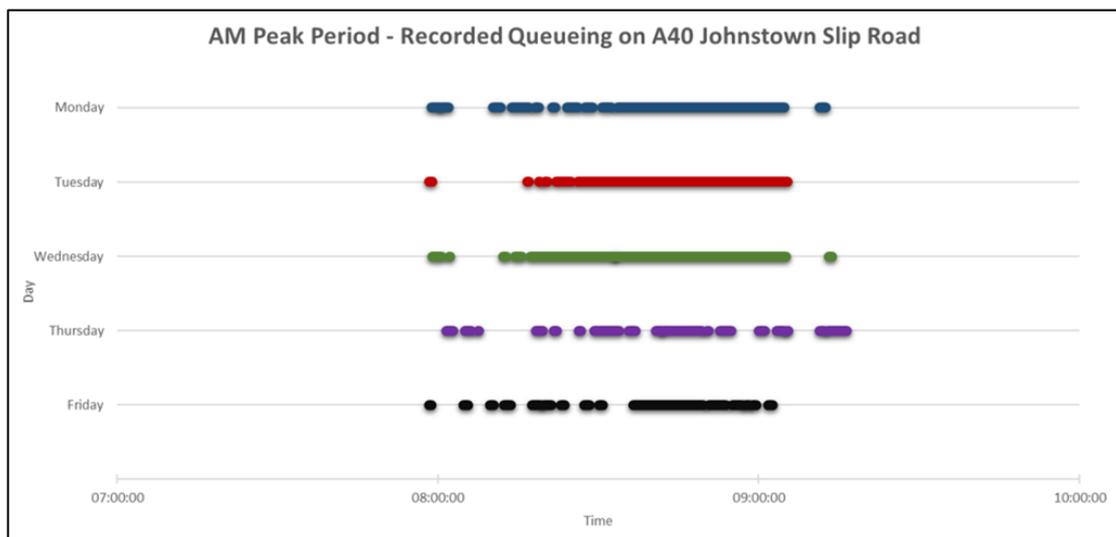


Figure 2-15 Traffic Survey Data – Queueing from Johnstown Slips (AM Peak Period)

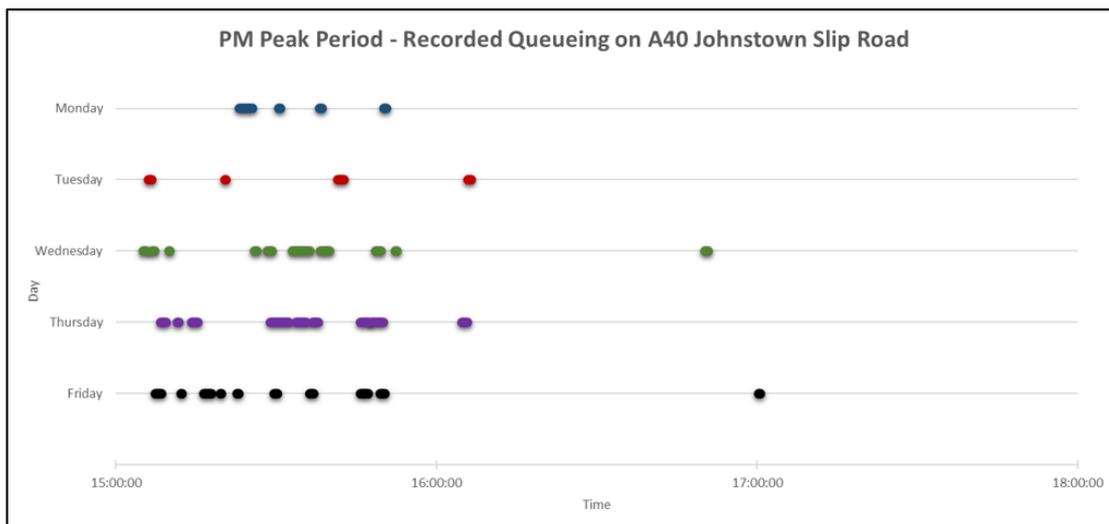


Figure 2-16 Traffic Survey Data – Queueing from Johnstown Slips (PM Peak Period)

It has been identified that there is recorded queueing back from the Johnstown Slips (J4) westbound off-slip for the majority of the AM peak period, with a constant queue recorded between approximately 0815 and 0905 on Monday, Tuesday and Wednesday. The recorded queueing is less frequent in the PM peak period, although it is noted that the majority of recorded occurrences arose between 1500 and 1600, as oppose to within the traditional PM peak hour (1700-1800).

Due to the nature of the observed queueing back, it is considered that the location of a primary (Rhydygors School) and high (Queen Elizabeth High School) school to the south of the Johnstown Slips (J4) is a key contributor to the queueing back onto the A40. It is however considered that the Johnstown Slips (J4) is also a key junction in the context of the local highway network and therefore there is also a significant traffic demand for non-education-based trips through the area.

2.4.11. Stakeholder Engagement

Programme of Engagement

The collaboration and involvement of key stakeholders is important throughout the whole WeITAG process, particularly with the five ways of working set out within the Well-being of Future Generations (Wales) Act 2015 in mind. On this basis, a programme of engagement with key stakeholders has been developed to inform this WeITAG Stage One study.

The programme of engagement included the provision of initial engagement packs to key stakeholders, which requested information from the stakeholders on:

- The existing issues along the A40 between Carmarthen and St Clears and the experience of them;
- What is considered important in setting key objectives for a potential improvement scheme; and
- Any improvement options that should be considered as appropriate for the area.

The initial engagement packs distributed to key stakeholders is provided within the IAR.

Consultation Feedback

A total of 23 responses have been obtained as part of the programme of stakeholder engagement, with the respondents ranging from public sector bodies of national, regional and local scale to private sector organisations.

A summary of the key stakeholder responses to the initial engagement packs is provided in **Figure 2-17**, with the more common responses larger in scale.

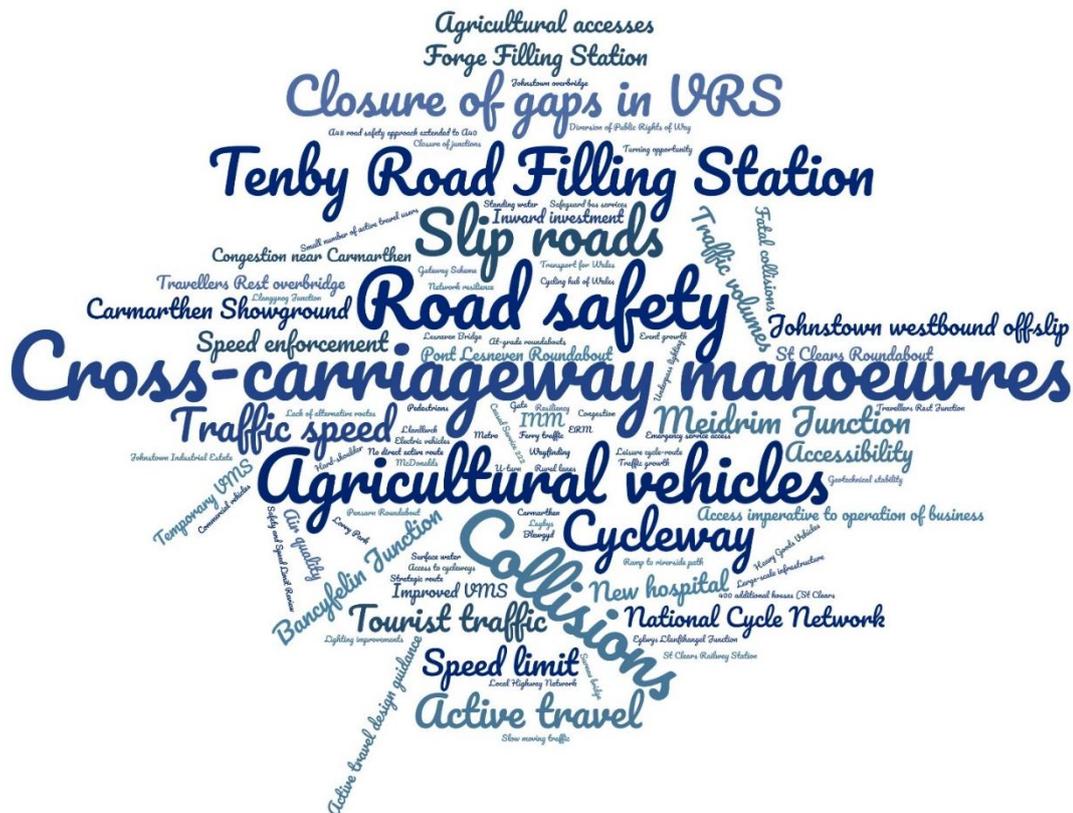


Figure 2-17 Summary of Consultation Feedback

As shown in Figure 2-17, the following themes were particularly prevalent within the stakeholder feedback:

- **Cross-Carriageway Manoeuvres** – road safety concerns related to the right-turn movements at the minor junctions within the scheme area;
- **Road Safety** – a number of road safety concerns were raised, including slow moving vehicles (namely agricultural vehicles), cross-carriageway manoeuvres, and the length of slip roads at the junctions;
- **Tenby Road Filling Station** – concerns were raised relating to the layout of the Tenby Road Filling Station (J12) junction, with the lack of egress slip road considered inappropriate;
- **Closure of Gaps in Vehicle Restraint System (VRS)** – the potential for closures in the VRS was generally considered appropriate to restrict some unsafe manoeuvres, although it was noted that new u-turning provision will need to be identified;
- **Collisions** – it was perceived by a number of stakeholders that the number and severity of collisions within the scheme area is significant;
- **Cycleway** – a number of stakeholders identified that the existing cycleways adjoining the A40 do not tie-into any further existing dedicated infrastructure; and
- **Traffic Speed** – it is perceived by a number of stakeholders that vehicle speed within the scheme area is significant, contributing to the number and severity of collisions. In addition, it was raised that there is limited enforcement of speed limits within the scheme area.

In addition to the general themes of feedback, a summary is provided within the accompanying IAR for the key stakeholders from: CCC, Welsh Government and SWTRA, TfW, Hywel Dda Health Board, Carmarthen and St Clears Town Councils, Dyfed-Powys Police and Sustrans.

2.4.12. Summary of Transport Problems

On the basis of the review of the scheme area and engagement with key stakeholders, the perceived issues have been collated and packaged into a set of transport problems specific to the scheme area. The scheme area specific transport problems are summarised in **Table 2-5**.

Ref.	Transport Problem	Rationale
TPR1	Cross-carriageway manoeuvres at minor road junctions ²⁹ .	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.

²⁹ 'Minor road junctions' refers to: J3, J6-J9, J11, J13-J29a, J30-J36 and J38-39b.

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 2-5 Transport Problems

Consideration against Well-being Goals

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

In order to provide a comparative analysis, the impacts of the transport problems on each of the well-being goals have been scored using a three-point scale, as follows:

- Positive Impact (+) – green;
- Neutral Impact (0) – blue; and
- Adverse Impact (-) – red.

A summary of the impacts of the transport problems on the national and local well-being goals is provided in **Table 2-6**, with justification for the scoring provided within the IAR.

Well-being Goals		Transport Problems											
		TPR1	TPR2	TPR3	TPR4	TPR5	TPR6	TPR7	TPR8	TPR9	TPR10	TPR11	TPR12
		Cross-carriageway manoeuvres at minor road junctions.	Inadequate layout of minor road junctions.	Notable collision clusters.	Inconsistent slow-moving vehicles.	Sub-standard laybys.	Highway drainage and surfacing.	Limited active travel linkages.	Limited safe and convenient bus infrastructure and services.	Peak period delay to the east of the Johnstown Slips.	Seasonal traffic.	Poor scheme area resilience.	Limited access to electric vehicle infrastructure.
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	0	-	-	0	0	0	-
WBG5	A Wales of Cohesive Communities	-	-	-	-	0	0	-	-	-	-	-	-
WBG6	A Wales of Vibrant Culture and Thriving Welsh Language	0	0	0	0	0	0	0	0	0	0	0	0
WBG7	A Globally Responsible Wales	-	-	-	-	-	-	-	-	-	-	-	-
LWBG1	Healthy Habits	0	0	0	0	0	0	-	-	0	0	0	0
LWBG2	Early Intervention	0	0	0	0	0	0	0	0	0	0	0	0
LWBG3	Strong Connections	-	-	-	-	0	0	-	-	-	-	-	-
LWBG4	Prosperous People and Places	-	-	-	-	-	-	0	-	-	-	-	-

Table 2-6 Consideration of Transport Problems' Impacts on Well-being Goals

2.5. Transport Planning Objectives

The setting of TPOs is outlined as a key output of the strategic case within WeITAG. On this basis, a set of five TPOs have been developed for the purpose of the A40 Carmarthen to St Clears WeITAG, based on the transport problems identified which were shown to have a significant adverse impact on the well-being of future generations.

The A40 Carmarthen to St Clears TPOs are outlined in **Table 2-7**.

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.
TPO2	Minimise the safety risk for active travel users within the scheme area.	Whilst provision for active travel is limited, noting the function and purpose of the scheme area, it is considered that the presence of cycleways and PRow on the A40 could lead to active travel demand on a high-speed road. It is also noted that without having a significant adverse impact on the environment.
TPO3	Improve access by all transport modes, without having a significant adverse impact on the environment.	Due to the proposed development of the new West Wales hospital to the west of the scheme area and strategic development aspirations in the region, it is considered that access by all transport modes needs to be improved.
TPO4	Improve the operational efficiency of the strategic highway network, without having a significant adverse impact on the environment.	The review of transport problems has identified existing journey time constraints within the scheme area (TPR9 and TPR10).
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 2-7 Transport Planning Objectives

2.5.1. **Validation of Transport Planning Objectives**

The identified transport problems and well-being goals have been considered in the context of the TPOs. In order to provide a comparative analysis, the impacts of the TPOs on the transport problems and their contribution to the well-being goals have been scored using a three-point scale, as follows:

- Positive Impact (+) – green;
- Neutral Impact (0) – blue; and
- Adverse Impact (-) – red.

It is considered that the TPOs have been developed using the five ways of working, as set out within Section 1.3.

It is demonstrated that together, the TPOs address all identified transport problems and achieve all well-being goals. On this basis, it is considered that any intervention that achieves all TPOs will address the identified transport problems and achieve the well-being goals.

Validation Against Transport Problems

A summary of how the TPOs address the identified transport problems is provided in **Table 2-8**, with the justification provided within the IAR.

Transport Problems		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.
TPR1	Cross-carriageway manoeuvres at minor road junctions.	+	0	0	0	0
TPR2	Inadequate layout of minor road junctions.	+	+	0	0	0
TPR3	Notable collision clusters.	+	0	0	0	0
TPR4	Inconsistent slow-moving vehicles.	+	0	0	0	0
TPR5	Sub-standard laybys.	+	0	0	0	0
TPR6	Highway drainage and surfacing.	+	0	0	+	0
TPR7	Limited active travel linkages.	0	+	+	0	0
TPR8	Limited safe and convenient bus infrastructure and services.	+	+	+	0	+
TPR9	Peak period delay to the east of the Johnstown Slips.	0	0	+	+	0
TPR10	Seasonal traffic.	+	0	+	+	0
TPR11	Poor scheme area resilience.	+	0	+	+	+
TPR12	Limited access to electric vehicle infrastructure.	0	0	+	0	+

Table 2-8 Consideration of Transport Planning Objectives against Transport Problems

Validation Against Well-being Goals

A summary of how the TPOs can lead to a scheme achieving the well-being goals is provided in **Table 2-9**, with the justification provided within the IAR.

Well-being Goals		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.
WBG1	A Prosperous Wales	+	0	+	+	+
WBG2	A Resilient Wales	+	0	0	+	+
WBG3	A Healthier Wales	+	+	0	0	+
WBG4	A More Equal Wales	0	+	+	+	+
WBG5	A Wales of Cohesive Communities	+	+	+	+	+
WBG6	A Wales of Vibrant Culture and Thriving Welsh Language	0	0	0	0	0
WBG7	A Globally Responsible Wales	+	+	+	+	+
LWBG1	Healthy Habits	0	+	0	0	+
LWBG2	Early Intervention	0	0	+	+	+
LWBG3	Strong Connections	+	+	+	+	+
LWBG4	Prosperous People and Places	+	0	+	+	+

Table 2-9 Consideration of Transport Planning Objectives against Well-being Goals

2.6. Establishment of Long-List

It has been identified that there are 12 key transport problems within the scheme area, which are likely to be exacerbated in the future without an intervention on the network. The TPOs have been developed to address the key transport problems identified, which have subsequently been used in the development of an options long-list.

The long-list options present a range of interventions that consider all modes of travel, as required by WeITAG. To assist interpretation and to reflect potential packages of intervention measures, the long-list options have been split into the 'intervention themes' illustrated in **Figure 2-18**.

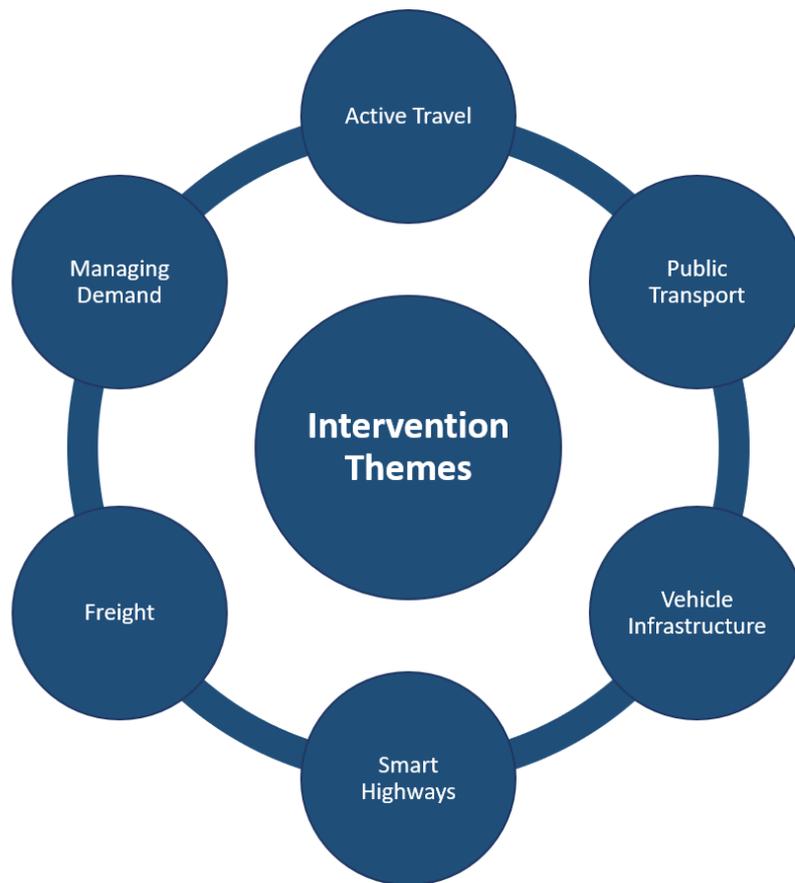


Figure 2-18 Intervention Themes – Long-List Options

2.6.1. Delivery Timescales

As part of developing the long-list options, consideration has been given to the potential timescale for delivery of each option, with reference to the following:

- Short-Term (ST) – within two years;
- Medium-Term (MT) – two to five years; and
- Long-Term (LT) – over five years.

It should be noted that the timescales for delivery does not refer to the priority of each option; with further details relating to the priority of each option provided in **Chapter 5**.

2.6.2. Long-List of Options

The long-list of potential options are summarised in **Table 2-10**.

Ref.	Option Description	Rationale	Timescale for Delivery
<i>Active Travel (AT)</i>			
AT1	Improvements to the existing SUP and cycleway within the scheme area.	Stakeholder feedback and the HD42/17 assessment has identified limitations to the existing SUP and cycleway within the scheme area and suggested that they should be upgraded to the latest active travel design guidance.	ST / MT
AT2	Provision of an active travel route adjacent to the carriageway between the Meidrim and Bancyfelin junctions.	There is currently considered to be limited active travel linkages (TPR7) within the scheme area, and therefore provision of a new cycleway in this location (J14-J19) could improve safety (TPO2) and provision for active travel users.	LT
AT3	Improvements to the CCC ERM routes, where appropriate.	It is considered that there are limitations on the existing active travel route on the Pont Lesneven Roundabout (J2), on the Johnstown Slips (J4) overbridge and in the subway in the vicinity of the Travellers Rest (J5) junction.	ST / MT
AT4	Development of the CCC INM routes.	The CCC INM routes in the vicinity of the scheme area are identified in Table 2-2 and it is considered that implementation of these schemes could potentially address the issue of limited active travel linkages (TPR7) in the area. It is also noted that CCC INM route SC5 has been considered by the 'A40 Bancyfelin to St Clears Shared Use Path' study, which has identified a preferred route for a cycleway in this location (J19-J28).	ST / MT
AT5	Closure of PRow crossing the A40 and identification of suitable alternative routes.	A total of two PRow cross the scheme area at-grade. Further consideration is required to determine the suitability of the crossings on the A40.	ST
AT6	Improvements to the PRow crossing the A40.	A total of two PRow cross the scheme area at-grade. Further consideration is required to determine the suitability of the crossings on the A40.	ST
AT7	New crossing opportunities for pedestrians and cyclists within the scheme area.	Grade-separated crossing points could improve active travel linkages in the area (TPR7), as well as providing suitable alternative routes to the existing PRow within the scheme area.	MT / LT
AT8	Improvements to active travel linkages to the bus stops.	It is considered that improvements to the pedestrian provision in the vicinity of the bus stops could increase the accessibility of the facilities, improving safety for active travel users.	ST / MT
AT9	Removal of signage directing cyclists along the previous alignment of NCN4.	Stakeholder feedback has identified that signage directing cyclists along the previous alignment of NCN4 has been retained. As a new route for NCN4 has been developed, this signage is potentially causing confusion in user identification of the new route.	ST
AT10	Improvements to the wider routeing of NCN4 away from the A40.	It is noted that much of the NCN4 route away from the A40 utilises on-road facilities, albeit on local roads with low vehicle flows. It is considered that it may be appropriate to provide off-road facilities to increase the attractiveness of the NCN route.	ST / MT
AT11	Introduction of a Traffic Regulation Order prohibiting the use of A40 by pedestrians.	The A40 functions as a strategic road and it is not considered appropriate for pedestrians to walk along the verge. On this basis, it is considered that prohibiting pedestrian access to the verge would reduce the risk of inadvertent vehicular / pedestrian collisions.	ST / MT
AT12	Introduction of signage warning drivers of active travel users.	Providing warning signs within the scheme area could increase driver awareness of potential ad-hoc active travel movements, reducing the risk of inadvertent vehicular / active travel collisions.	ST
<i>Public Transport (PT)</i>			
PT1	Improvements to the existing Carmarthen Park and Ride.	To encourage drivers to travel into Carmarthen town centre using public transport, addressing perceived congestion issues at the eastern end of the scheme area and supporting the Air Quality Management Area in Carmarthen.	ST / MT
PT2	Bus priority infrastructure.	To improve bus journey times and reliability, which could encourage mode shift towards public bus.	MT / LT
PT3	Improvements to junction layouts to facilitate the safe movement of buses at the Meidrim and Bancyfelin junctions.	To improve safety for bus users through addressing a potential safety concern of cross-carriageway bus manoeuvres (TPR1).	MT / LT
PT4	Bus vehicle actuated (VA) warning signs at the Meidrim and Bancyfelin junctions.	To warn drivers when buses will be crossing the carriageway at the two junctions, addressing in part, the safety concern identified as TPR1.	ST
PT5	Introduction of a strategic bus corridor along the scheme area to facilitate a rapid transit style service.	Provision of a high speed, efficient public transport service between key settlements could present an opportunity for mode shift away from the private car.	LT
PT6	New local and regional bus services, as well as increases in bus service frequencies.	To encourage an increase in overall bus patronage and support a modal shift from the private car.	MT
PT7	Improvements to the existing bus stop infrastructure provision.	To improve the attractiveness of existing local bus services and improve the safety of the existing facilities for buses, as well as pedestrians accessing the facilities.	MT
PT8	Further consideration of a potential new railway station in the vicinity of St Clears.	Following completion of a 'Stage Two' assessment by the Welsh Government, it was recommended that the St Clears Railway Station is progressed to a 'Stage Three' assessment, that includes the production of a WeITAG Stage One report. This could consider the potential demand from the LDP allocations surrounding St Clears and the wider catchment area.	LT
PT9	Improvements to rail infrastructure between Carmarthen, Haverfordwest and Tenby.	To encourage use of rail services between the key regional hubs of Carmarthen, Haverfordwest and Tenby, reducing traffic demand within the scheme area.	LT
PT10	Increased rail service frequency between Carmarthen, Haverfordwest and Tenby.	To encourage use of rail services between the key regional hubs of Carmarthen, Haverfordwest and Tenby, reducing traffic demand within the scheme area.	LT
<i>Vehicle Infrastructure (VI)</i>			
VI1	Introduction of targeted speed limit restrictions along the A40.	To reduce the likelihood of collisions in isolated locations, relating to cross-carriageway manoeuvres and rear-shunt collisions. It is also noted that there are some collisions located away from any junctions, which speed could have been a contributing factor in.	ST / MT

Ref.	Option Description	Rationale	Timescale for Delivery
VI2	Introduction of speed limit reduction along the full length of the scheme area.	To provide better control of vehicular traffic and more efficient engine operation. This could serve to provide air quality improvements within the scheme area and would be consistent with similar schemes introduced elsewhere on the strategic highway network in Wales.	MT
VI3	Introduction of speed enforcement cameras.	To reduce the number of drivers exceeding the speed limit, which reduces the risk of collisions from speeding vehicles.	ST / MT
VI4	Re-configuration of cross-carriageway manoeuvre opportunities at minor road junctions.	As identified within TPR1, there are a number of junctions where cross-carriageway manoeuvres present a safety risk for vehicle users.	ST / MT
VI5	Closure of minor road junctions.	As identified within TPR1, there are a number of junctions where cross-carriageway manoeuvres present a safety risk for vehicle users.	MT
VI6	Improved configuration of minor road junctions.	As identified in TPR2, the layout of a number of the minor road junctions is considered inadequate for the nature of the scheme area.	MT
VI7	Capacity improvement measures at minor road junctions.	Providing capacity improvements at the junctions could reduce waiting time for vehicles, reducing the likelihood for driver frustration and associated un-safe manoeuvres.	LT
VI8	Closure of, or amendments to, the laybys within the scheme area.	To reduce the likelihood of vehicle collision on access and egress, applicable to the sub-standard layout of the facilities, as identified as TPR5.	ST / MT
VI9	New service station facility adjacent to the A40.	To potentially reduce the likelihood of collisions through increasing opportunities for rest stops.	LT
VI10	Improved signage to the food and drink facilities accessed from the Pensarn, Pont Lesneven and St Clears Roundabouts.	To potentially reduce the likelihood of collisions through maximising driver awareness of existing rest stops.	ST
VI11	Provision of additional all traffic lanes in both directions along the entirety of the scheme area.	Increasing the operational efficiency of the existing A40 could reduce the impact of peak period delay (TPR9) and seasonal traffic (TPR10), as well as improving the scheme area resilience (TPR11).	LT
VI12	Improved highway drainage and surfacing, where appropriate.	Stakeholder feedback has suggested that there are instances when standing water from heavy rain is present within the scheme area.	ST / MT
VI13	Capacity improvement measures on Pont Lesneven, inclusive of the Pensarn and Pont Lesneven Roundabouts.	To alleviate the existing peak period delay experienced on this section of the A40 (TPR9), which is exacerbated by seasonal increases in traffic demand (TPR10).	MT / LT
VI14	Road safety improvement measures on Pont Lesneven, inclusive of the Pensarn and Pont Lesneven Roundabouts.	The collision data (25 in five years) has recorded a collision cluster (TPR3) on this section of the A40, while the 'Safety and Speed Limits Review' proposed signalisation of the Pont Lesneven Roundabout (J2) to address existing safety concerns.	MT / LT
VI15	Capacity improvement measures at the Johnstown Slips.	To alleviate the existing peak period delay experienced on this section of the A40 (TPR9), which is exacerbated by seasonal increases in traffic demand (TPR10).	MT / LT
VI16	Road safety improvement measures at the Johnstown Slips.	Although there is no significant collision cluster that has been identified at the Johnstown Slips (J4), it is considered that the occurrences of queueing back onto the A40 mainline could present a potential safety concern.	MT / LT
VI17	Capacity improvement measures at the Travellers Rest junction.	Although there is currently limited journey time delay recorded at the Travellers Rest (J5) junction, an increase in future traffic demand, particularly to / from the Carmarthen West Link Road, could cause future congestion issues.	MT / LT
VI18	Road safety improvement measures at the Travellers Rest junction.	Feedback from a stakeholder identified an existing road safety concern with the layout of the Travellers Rest (J5) slip roads.	MT / LT
VI19	Stabilisation of the Carmarthen Showground slips.	Stakeholder feedback highlighted that there are geotechnical stability concerns that require further investigation at the Carmarthen Showground (J10) junction.	MT
VI20	Restrictions and rationalisation of parking opportunities for HGVs adjacent to the A40.	The 'Safety and Speed Limits Review' identified an existing issue with HGVs parking on the boundary of the A40 at the Forge Restaurant, Lodge and Filling Station (J29b) junction, restricting visibility of egress from the site.	MT
VI21	Capacity improvement measures at the High Street Slips.	Although no existing capacity constraints have been identified at the High Street Slips (J40), future traffic growth, exacerbated by seasonal traffic demand (TPR10), could cause a future capacity constraint in the future.	MT / LT
VI22	Road safety improvement measures at the High Street Slips.	A small collision cluster was identified at the High Street Slips (J40), while future traffic growth, exacerbated by seasonal traffic demand (TPR10), could increase the potential for collisions in the future.	MT
VI23	Capacity improvement measures at the St Clears Roundabout.	It has been that the St Clears Roundabout (J41) suffers from journey time delay, particularly on the A477 arm, during the peak of seasonal traffic (TPR10).	MT / LT
VI24	Road safety improvement measures at the St Clears Roundabout.	Although there is no significant collision cluster that has been identified at the St Clears Roundabout (J41), an increase in traffic demand during the summer peak (TPR10) and the consent for local developments could increase the potential for collisions at the junction.	MT / LT
VI25	Strategic link road to the south and east of Carmarthen, linking White Mill (east) to the A40 west of Carmarthen, via the A48.	A strategic link road could reduce peak period delay to the east of Johnstown Slips (J4) within the scheme area (TPR9) and reduce the impact of an increase in seasonal traffic demand (TPR10).	LT
VI26	Improved westbound signage in the vicinity of the Tenby Road Filling Station.	Temporary signage has been provided adjacent to the westbound carriageway since a fatal collision occurred in this location. It is considered that a permanent solution is required to minimise the potential for similar instances in this location.	ST
VI27	Introduction of improved, or new, agricultural vehicle warning signs.	Stakeholder feedback and collision data suggests that there is an existing issue with inconsistent slow-moving vehicles, particularly agricultural vehicles, within the scheme area.	ST

Ref.	Option Description	Rationale	Timescale for Delivery
VI28	Speed limit and signage review in the vicinity of the St Clears Roundabout.	The 'Safety and Speed Limits Review' has identified the need for a signage review relating to speeds on the A40 West approach to the St Clears Roundabout. Although it is noted that this section of the A40 is not within the scheme area, it is considered that a signage review in the vicinity of the St Clears Roundabout could benefit the junction; which is within the scheme area.	ST
VI29	Introduction of street lighting, where appropriate.	The introduction of street lighting could reduce the potential for collisions, improving the resilience of the scheme area.	ST
VI30	Improvements to alternative and diversion routes.	Stakeholder feedback indicates that the resilience of the corridor is affected by the poor quality of alternative and diversionary routes. Improvements to these routes could potentially address the issues identified as TPR11.	MT
VI31	Introduction of a hard shoulder.	Stakeholder feedback indicates that the resilience of the corridor is affected by the poor quality of alternative and diversionary routes available during collisions within the scheme area. Provision of a hard shoulder could potentially improve the resilience of the scheme area, addressing the issues identified as TPR11.	LT
VI32	Introduction of air quality monitoring sites.	Whilst the area has not been identified as an AQMA, the provision of air quality monitoring sites could provide a better database of information for future monitoring.	ST
VI33	Introduction of noise mitigation and/or improvement measures.	It is noted that there are a number of noise priority and proximity areas of relevance to the scheme area and therefore measures to reduce the noise produced by transport in the area may be appropriate.	ST
<i>Smart Highways (SH)</i>			
SH1	Introduction of VA warning signs.	Improving the information for vehicle users could improve the user experience and safety of the scheme area, warning drivers when exceeding the speed limit or if there is a known issue upstream, enabling drivers to take an alternative route.	ST
SH2	Introduction of an automated variable speed limit, inclusive of associated infrastructure.	To provide better control of vehicular traffic, improving traffic flow, air quality and safety within the scheme area.	LT
SH3	Introduction of variable information boards.	To provide information for vehicle users of issues or events, such as conditions at the strategic ports in Pembrokeshire.	ST / MT
SH4	Provision of additional electric vehicle charging opportunities within the scheme area.	To support the UK-wide aspiration to shift from petrol / diesel cars, including the ban on petrol and diesel car sales from 2035.	MT
SH5	Introduction of high-occupancy vehicle lanes.	To reduce the vehicle demand within the scheme area, which could reduce both congestion and carbon emissions.	MT
SH6	Introduction of autonomous vehicle infrastructure.	To support future technology trends, as it is recognised that autonomous vehicles, of varying levels of autonomy, could form a proportion of the vehicle fleet in the coming decades.	LT
SH7	Amendments to tax regimes relating to alternative fuel vehicles (such as electric vehicles).	As electric vehicles will form a larger proportion of the vehicle fleet in the future, a new tax regime may need to be considered in order to replace the revenue lost from fuel and vehicle excise duty taxation.	LT
SH8	Introduction of a dynamic road user charging regime for visitors to the area.	Through charging visitors for travelling in the area by car, a new revenue stream can be created for the Welsh Government, while visitors could be discouraged from travelling by private car to the area, potentially reducing the impact of an increase in seasonal traffic demand (TPR10).	LT
<i>Freight (FR)</i>			
FR1	Prioritise the movement of freight by rail, as oppose to road-based methods.	To reduce the amount of pollution caused by road-based freight, facilitating a shift to a carbon neutral economy.	LT
FR2	Restrict HDVs from accessing the outside lane of the A40.	To ensure that light vehicles, travelling at a faster speed, are able to pass the HDVs without conflict, maximising the operational efficiency of the A40.	ST
FR3	New HGV parking site at the Carmarthen Showground.	During stakeholder consultation the Carmarthen Showground was identified as a potential location for an HGV parking site, which could provide a safe and convenient location for HGV drivers to park and rest, as appropriate.	MT
FR4	Improved HGV restriction signage.	Stakeholder feedback has suggested that some large HGVs have been re-routing through the village of Llanllwch to avoid traffic delays to the east at the Johnstown Slips (J4). Although there is existing signage restricting this, improvements could minimise the potential for HGVs utilising this unsuitable route.	ST
<i>Managing Demand (MD)</i>			
MD1	Compose a new regional Travel Planning Strategy.	To ensure that all existing major and new developments are sustainable and maximise usage of sustainable travel modes, where appropriate. The Travel Planning Strategy could investigate opportunities to reduce traffic demand through a range of measures, including the introduction of car clubs and pool cars which is identified within the 'Transport Fit for Future Generations' as a potential measure to relieve congestion.	LT
MD2	Introduction of dynamic road user charging.	To manage traffic demand, road capacity could be dynamically priced so that road users pay the full marginal social cost of their journey. Through introducing dynamic road user charging, such as peak-hour tolls, road users could pay an appropriate taxation based on their impact on congestion and air / noise pollution.	LT
MD3	Promotion of changes to working practices.	Through changes to working practices, including the encouragement and promotion of working from home, traffic demand could be reduced in the area.	ST / MT / LT

Table 2-10 Long-List of Options

3. Transport Case

3.1. Overview

The typical purpose of the Transport Case, which should be well developed by the end of WeITAG Stage Two, is to outline the forecast impacts and consider the value for money of each of the options. At WeITAG Stage One, it is proportionate to consider the Transport Case within a qualitative review to inform the sifting of the long-list to a short-list of appropriate measures for further consideration.

The long-list options of options have been assessed against the identified TPOs, which is considered proportionate at this stage of the study. It is demonstrated within Table 2-8 and Table 2-9 that the TPOs address all the identified Transport Problems and meet all the national and well-being goals, respectively. On this basis, it is considered that the TPOs are a suitable assessment framework for this stage of WeITAG, with further appraisal undertaken at later stages of WeITAG.

3.2. Assessment of Long-List

The assessment of the long-list options in the context of the TPOs is provided in **Table 3-1**.

As the likely extent of the impacts relating to each of the long-list options is not known at this stage, a comparative analysis of the TPOs on each of the long-list options has been undertaken. The following three-point appraisal scale has been utilised:

- Likely Positive Impact (+) – green;
- Likely Neutral Impact (0) – blue; and
- Likely Adverse Impact (-) – red.

Option		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.
<i>Active Travel</i>						
AT1	Improvements to the existing SUP and cycleway within the scheme area.	0	+	+	0	0
AT2	Provision of an active travel route adjacent to the carriageway between the Meidrim and Bancyfelin junctions.	0	+	+	0	0
AT3	Improvements to the CCC ERM routes, where appropriate.	0	+	+	0	0
AT4	Development of the CCC INM routes.	0	+	+	0	0
AT5	Closure of PRow crossing the A40 and identification of suitable alternative routes.	0	+	0	0	0
AT6	Improvements to the PRow crossing the A40.	0	+	+	0	0
AT7	New crossing opportunities for pedestrians and cyclists within the scheme area.	0	+	+	0	0
AT8	Improvements to active travel linkages to the bus stops.	0	+	+	0	+
AT9	Removal of signage directing cyclists along the previous alignment of NCN4.	0	+	0	0	0
AT10	Improvements to the wider routing of NCN4 away from the A40.	0	0	+	0	0
AT11	Introduction of a Traffic Regulation Order prohibiting the use of A40 by pedestrians.	0	+	-	0	0
AT12	Introduction of signage warning drivers of active travel users.	0	+	0	0	0
<i>Public Transport</i>						
PT1	Improvements to the existing Carmarthen Park and Ride.	0	0	+	0	+
PT2	Bus priority infrastructure.	0	0	+	-	+
PT3	Improvements to junction layouts to facilitate the safe movement of buses at the Meidrim and Bancyfelin junctions.	+	0	+	-	+
PT4	Bus vehicle actuated (VA) warning signs at the Meidrim and Bancyfelin junctions.	+	0	+	0	+
PT5	Introduction of a strategic bus corridor along the scheme area to facilitate a rapid transit style service.	0	0	+	0	+
PT6	New local and regional bus services, as well as increases in bus service frequencies.	0	0	+	0	+
PT7	Improvements to the existing bus stop infrastructure provision.	+	0	+	0	+
PT8	Further consideration of a potential new railway station in the vicinity of St Clears.	0	0	+	+	+
PT9	Improvements to rail infrastructure between Carmarthen, Haverfordwest and Tenby.	0	0	+	+	+
PT10	Increased rail service frequency between Carmarthen, Haverfordwest and Tenby.	0	0	+	+	+

Option		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.
<i>Vehicle Infrastructure</i>						
VI1	Introduction of targeted speed limit restrictions along the A40.	+	0	0	0	0
VI2	Introduction of speed limit reduction along the full length of the scheme area.	+	+	0	-	0
VI3	Introduction of speed enforcement cameras.	+	0	0	0	0
VI4	Re-configuration of cross-carriageway manoeuvre opportunities at minor road junctions.	+	0	0	+	0
VI5	Closure of minor road junctions.	+	+	-	+	0
VI6	Improved configuration of minor road junctions.	+	+	0	+	0
VI7	Capacity improvement measures at minor road junctions.	0	0	0	0	0
VI8	Closure of, or amendments to, the laybys within the scheme area.	+	0	0	0	0
VI9	New service station facility adjacent to the A40.	0	0	0	0	+
VI10	Improved signage to the food and drink facilities accessed from the Pensarn, Pont Lesneven and St Clears Roundabouts.	0	0	+	0	0
VI11	Provision of additional all traffic lanes in both directions along the entirety of the scheme area.	-	0	-	+	0
VI12	Improved highway drainage and surfacing, where appropriate.	+	0	0	+	0
VI13	Capacity improvement measures on Pont Lesneven, inclusive of the Pensarn and Pont Lesneven Roundabouts.	+	0	+	+	0
VI14	Road safety improvement measures on Pont Lesneven, inclusive of the Pensarn and Pont Lesneven Roundabouts.	+	0	0	0	0
VI15	Capacity improvement measures at the Johnstown Slips.	+	0	+	+	0
VI16	Road safety improvement measures at the Johnstown Slips.	+	0	0	0	0
VI17	Capacity improvement measures at the Travellers Rest junction.	0	0	+	+	0
VI18	Road safety improvement measures at the Travellers Rest junction.	+	0	0	0	0
VI19	Stabilisation of the Carmarthen Showground slips.	0	0	0	0	0
VI20	Restrictions and rationalisation of parking opportunities for HGVs adjacent to the A40.	+	+	+	0	0
VI21	Capacity improvement measures at the High Street Slips.	0	0	0	+	0
VI22	Road safety improvement measures at the High Street Slips.	+	0	0	0	0

Option		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.
VI23	Capacity improvement measures at the St Clears Roundabout.	0	0	+	+	0
VI24	Road safety improvement measures at the St Clears Roundabout.	0	0	0	0	0
VI25	Strategic link road to the south and east of Carmarthen, linking White Mill (east) to the A40 west of Carmarthen, via the A48.	+	0	+	+	+
VI26	Improved westbound signage in the vicinity of the Tenby Road Filling Station.	+	0	0	0	0
VI27	Introduction of improved, or new, agricultural vehicle warning signs.	+	0	0	0	0
VI28	Speed limit and signage review in the vicinity of the St Clears Roundabout.	+	0	0	0	0
VI29	Introduction of street lighting, where appropriate.	+	+	0	0	0
VI30	Improvements to alternative and diversion routes.	+	+	+	0	0
VI31	Introduction of a hard shoulder.	+	0	+	+	0
VI32	Introduction of air quality monitoring sites.	0	0	0	0	+
VI33	Introduction of noise mitigation and/or improvement measures.	0	0	0	0	0
<i>Smart Highways</i>						
SH1	Introduction of VA warning signs.	+	0	0	0	0
SH2	Introduction of an automated variable speed limit, inclusive of associated infrastructure.	+	0	0	+	0
SH3	Introduction of variable information boards.	0	0	+	+	+
SH4	Provision of additional electric vehicle charging opportunities within the scheme area.	0	0	+	0	+
SH5	Introduction of high-occupancy vehicle lanes.	-	0	0	-	0
SH6	Introduction of autonomous vehicle infrastructure.	+	0	0	+	+
SH7	Amendments to tax regimes relating to alternative fuel vehicles (such as electric vehicles).	0	0	0	0	+
SH8	Introduction of a dynamic road user charging regime for visitors to the area.	0	0	0	0	+
<i>Freight</i>						
FR1	Prioritise the movement of freight by rail, as oppose to road-based methods.	+	0	0	+	0
FR2	Restrict HDVs from accessing the outside lane of the A40.	0	0	0	0	0
FR3	New HGV parking site at the Carmarthen Showground.	+	0	0	0	0

Option		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.
FR4	Improved HGV restriction signage.	+	0	0	0	0
<i>Managing Demand</i>						
MD1	Compose a new regional Travel Planning Strategy.	0	0	+	+	+
MD2	Introduction of dynamic road user charging.	0	0	0	+	+
MD3	Promotion of changes to working practices.	0	0	+	+	0

Table 3-1 Consideration of Long-List Options against Transport Planning Objectives

3.3. Determination of Short-List

A key output of a WeITAG Stage One study is to determine a short-list of options for further consideration as part of WeITAG Stage Two, or relevant equivalent reports. **Table 3-2** presents a summary of whether each long-list option is appropriate for inclusion in the short-list for further consideration, making reference to the identified transport problems and how they align with the TPOs. The indicative timescales for delivery of the options are also provided for reference.

At this stage of the study, it has not been determined how each of the options would be delivered, with it being acknowledged that a number of the options would require collaboration with the Local Highway Authority and wider Authorities. It should be noted that a recommendation for further consideration within the short-list does not prescribe delivery by Welsh Government, with further consideration of the route to delivery forming a key aspect of review group discussions following completion of this WeITAG Stage One study.

Option	Timescale for Delivery	Inclusion on Short-List	Justification	
<i>Active Travel</i>				
AT1	Improvements to the existing SUP and cycleway within the scheme area.	ST / MT	Yes	It is considered that the existing SUP and cycleway is narrow in places and is not segregated from the A40 carriageway and therefore this intervention could provide a safety benefit for active travel users within the scheme area (TPO2), as well as improving the attractiveness of the routes (TPO3). Further investigation as to the appropriate active travel guidance to inform improvements to the routes will need to be considered at WeITAG Stage Two.
AT2	Provision of an active travel route adjacent to the carriageway between the Meidrim and Bancyfelin junctions.	LT	Yes	As there is currently no active travel provision between the Meidrim (J14) and Bancyfelin (J19) junctions on the A40, it is considered that this intervention could form part of a continuous active travel route between Carmarthen and St Clears, which is an aspiration of CCC. It should be noted that further consideration of the merit of this intervention in the context of the development of CCC INM routes SC6 and SC7 (AT4) will need to be undertaken at WeITAG Stage Two.
AT3	Improvements to the CCC ERM routes, where appropriate.	ST / MT	Yes	As some CCC ERM routes intersect the scheme area, it is considered that improvements to these routes could improve safety for active travel users (TPO2) and improve access by active travel modes (TPO3). On this basis, this intervention has been included on the short-list.
AT4	Development of the CCC INM routes.	ST / MT	Yes	A number of CCC INM routes are located within the scheme area and it is considered that development of these routes could provide a benefit to safety for active travel users (TPO2). It is also noted that development of the wider CCC INM routes could improve access for active travel users along the surrounding transport network (TPO3). On this basis, this intervention has been included on the short-list.
AT5	Closure of PRow crossing the A40 and identification of suitable alternative routes.	ST	Yes	As it is considered that at-grade pedestrian crossings along the A40 could be considered unsuitable, this intervention could provide a safety benefit for active travel users within the scheme area (TPO2). This intervention has therefore been included on the short-list.
AT6	Improvements to the PRow crossing the A40.	ST	Yes	As it is considered that at-grade pedestrian crossings along the A40 could be considered unsuitable, this intervention could provide a safety benefit for active travel users within the scheme area (TPO2) without the requirement to close any existing PRow. It is also considered that this intervention could improve the attractiveness of the scheme area for active travel users, having a slight beneficial impact on access (TPO3). On this basis, this intervention has been included on the short-list.
AT7	New crossing opportunities for pedestrians and cyclists within the scheme area.	MT / LT	Yes	It is considered that there are currently limited crossing opportunities for active travel users within the scheme area and therefore this intervention could minimise the safety risk for active travel users (TPO2) and improve active travel access across the A40 (TPO3). As there is no clear evidence to suggest a significant demand for active travel access across the A40, the suitability and value for money of this intervention would need to be considered in further detail at WeITAG Stage Two.
AT8	Improvements to active travel linkages to the bus stops.	ST / MT	Yes	This intervention could improve access to public transport (TPO3) and minimise the safety risk for active travel users (TPO2) within the scheme area, while also contributing to the delivery of the South-West Wales Metro. This intervention has therefore been included on the short-list.
AT9	Removal of signage directing cyclists along the previous alignment of NCN4.	ST	Yes	As there is a new off-road route that has been identified for NCN4, it is considered that this intervention could ensure cyclists are directed away from the A40 at the earliest opportunity, minimising the safety risk for cyclists within the scheme area (TPO2). On this basis, this intervention has been included on the short-list.
AT10	Improvements to the wider routing of NCN4 away from the A40.	ST / MT	No	Although NCN4 provides a primarily leisure cycle route between Carmarthen and St Clears, it is noted that the majority of the route utilises roads with limited vehicle traffic demand. In the vicinity of the scheme area, improvements to the existing NCN4 are identified within AT1, which has been included on the short-list. In addition to this, if the CCC INM routes are developed, a continuous cycleway will be provided parallel to the A40, which is a significantly more direct and convenient route for active travel users between the settlements of Carmarthen, Bancyfelin and St Clears. Therefore, based on feedback from active travel stakeholders, it is considered that the development of the CCC INM routes should be prioritised over improvements to the existing routing of NCN4 at this stage.
AT11	Introduction of a Traffic Regulation Order prohibiting the use of A40 by pedestrians.	ST / MT	Yes	It is considered that this intervention could deter pedestrians from utilising the existing verge of the A40, providing a safety benefit to active travel users (TPO2). Although it is noted that this intervention would have an adverse impact on access for active travel users (TPO3), it is considered that this adverse impact could be acceptable due to the potential safety benefits. Further investigation into the merits of this option would be included at WeITAG Stage Two, which would need to account for active travel access along the dedicated active travel infrastructure within the scheme area.
AT12	Introduction of signage warning drivers of active travel users.	ST	Yes	This intervention could provide a minor benefit to safety for active travel users within the scheme area (TPO2). The merits of this option would be considered further at WeITAG Stage Two.
<i>Public Transport</i>				
PT1	Improvements to the existing Carmarthen Park and Ride.	ST / MT	Yes	It is considered that improvements to the Carmarthen Park and Ride services and site could increase the attractiveness of the facility, reducing the traffic demand at the areas of peak period delay to the east of the Johnstown Slips (TPR9) as drivers utilise the Park and Ride service as an alternative. It is therefore considered that there is merit in investigating the measures that can be undertaken to improve the Carmarthen Park and Ride in more detail.
PT2	Bus priority infrastructure.	MT / LT	Yes	It is considered that the targeted introduction of bus priority infrastructure within the scheme area could encourage a modal shift from the private car, which could have a number of associated benefits. This intervention has therefore been included on the short-list.
PT3	Improvements to junction layouts to facilitate the safe movement of buses at the Meidrim and Bancyfelin junctions.	MT / LT	Yes	This intervention could improve the safety and efficiency of bus movements at the Meidrim (J14) and Bancyfelin (J19) junctions (TPO1), as well as addressing a safety concern raised by stakeholders at the Bancyfelin (J19) junction, further assisting delivery of the South-West Wales Metro (TPO5). It should therefore be included on the short-list for further investigation.
PT4	Bus vehicle actuated (VA) warning signs at the Meidrim and Bancyfelin junctions.	ST	Yes	This short-term intervention could provide a safety benefit to both vehicle and bus users through warning traffic of upcoming cross-carriageway bus manoeuvres (TPO1). It may be considered an appropriate short-term measure to address the existing safety concern and should be investigated further at WeITAG Stage Two.
PT5	Introduction of a strategic bus corridor along the scheme area to facilitate a rapid transit style service.	LT	Yes	A rapid transit style service could significantly improve the public transport offering for people towards Carmarthen (TPO3), assisting delivery of the South-West Wales Metro (TPO5). Although the demand and deliverability is currently not known, it is considered that this intervention should be included on the short-list for further investigation.

Option		Timescale for Delivery	Inclusion on Short-List	Justification
PT6	New local and regional bus services, as well as increases in bus service frequencies.	MT	Yes	This intervention could improve the existing bus service offering in the vicinity of the scheme area (TPO3), without having a noticeable impact on the operation of the existing highway network. It can also assist delivery of the South-West Wales Metro (TPO5) and should therefore be included on the short-list for further investigation into future demand patterns.
PT7	Improvements to the existing bus stop infrastructure provision.	MT	Yes	The existing bus stop infrastructure has been identified as a potential safety risk (TPR8), and therefore this option is considered a suitable option to progress for further investigation.
PT8	Further consideration of a potential new railway station in the vicinity of St Clears.	LT	Yes	A new railway station in the vicinity of St Clears would improve access to rail for residents in the surrounding areas (TPO3) and support delivery of the South-West Wales Metro (TPO5). Whilst it does not directly relate to the identified TPRs, it could be considered as a further benefit to public transport and it is therefore reasonable to investigate the feasibility and viability of this intervention further.
PT9	Improvements to rail infrastructure between Carmarthen, Haverfordwest and Tenby.	LT	Yes	This option could assist in the delivery of the South-West Wales Metro (TPO5) and facilitate a modal shift away from the private car. Whilst it does not directly relate to the identified TPRs, it could be considered as a further benefit to public transport and it is therefore reasonable to investigate this option further.
PT10	Increased rail service frequency between Carmarthen, Haverfordwest and Tenby.	LT	Yes	This option could assist in the delivery of the South-West Wales Metro (TPO5) and facilitate a modal shift away from the private car. Whilst it does not directly relate to the identified TPRs, it could be considered as a further benefit to public transport and it is therefore reasonable to investigate this option further.
<i>Vehicle Infrastructure</i>				
VI1	Introduction of targeted speed limit restrictions along the A40.	ST / MT	Yes	It is considered that safety benefits (TPO1) could be realised through targeted speed limit restrictions which are commensurate with key collision points within the scheme area. However, further investigation would be needed as to the impact of varying speed limits within the scheme area and the potential relationship with other options (such as VI3). It is considered appropriate that this option is included within the short-list for a WeITAG Stage Two study.
VI2	Introduction of speed limit reduction along the full length of the scheme area.	MT	No	The key benefits of this option would be to influence the operational efficiency of vehicles within the scheme area, resulting in lower vehicle emissions or more controlled flow to improve capacity. However, neither air quality or link capacity have been identified as significant issues within the scheme area and it is not considered that this option merits further investigation at this stage.
VI3	Introduction of speed enforcement cameras.	ST / MT	Yes	This intervention could have benefits at targeted locations within the scheme area to manage vehicular speeds and is therefore considered an appropriate option to consider further. It is noted that this intervention could be delivered independently or could be used as a supporting measure.
VI4	Re-configuration of cross-carriageway manoeuvre opportunities at minor road junctions.	ST / MT	Yes	TPR1 identified that cross-carriageway manoeuvres present a notable safety concern within the scheme area and it is considered this intervention could provide significant safety benefits to vehicle users (TPO1). This option should therefore be included on the short-list for further investigation at WeITAG Stage Two.
VI5	Closure of minor road junctions.	MT	Yes	This intervention could alleviate TPR1 through removing the opportunity for cross-carriageway manoeuvres at the minor junctions within the scheme area and is considered appropriate for further investigation. The impacts of the closure of minor junctions, particularly on access (TPO3), would be considered in full at WeITAG Stage Two, although it is noted that this adverse impact on access may be considered acceptable if significant safety benefits can be demonstrated.
VI6	Improved configuration of minor road junctions.	MT	Yes	TPR2 identified that the layouts of the minor road junctions are typically inadequate within the scheme area and therefore this intervention could provide significant safety benefits to vehicle users (TPO1). This option should therefore be included on the short-list for further investigation at WeITAG Stage Two.
VI7	Capacity improvement measures at minor road junctions.	LT	No	This WeITAG Stage One study has not identified any significant capacity constraints at the minor road junctions within the scheme area. On this basis, it is not considered that this option should be taken forward for further consideration at this stage.
VI8	Closure of, or amendments to, the laybys within the scheme area.	ST / MT	Yes	TPR3 identified that the existing laybys within the scheme area are of sub-standard layout and therefore pose a safety risk for vehicle users (TPO1). This option should therefore be included on a short-list for further investigation at Stage Two.
VI9	New service station facility adjacent to the A40.	LT	No	Due to the location of a significant number of food and drink facilities, presenting rest stop opportunities at either end of the scheme area, it is not considered that this is a necessary option and does not address a specific TPR. On this basis, the intervention is not considered appropriate to consider further at this stage.
VI10	Improved signage to the food and drink facilities accessed from the Pensarn, Pont Lesneven and St Clears Roundabouts.	ST	Yes	This option could maximise driver awareness of the existing rest stops at either end of the scheme area, providing a slight benefit to road safety for vehicle users (TPO1). It could also complement any schemes taken forward at the junctions (such as VI13-VI14 and VI23) and is therefore considered appropriate for inclusion in the short-list.
VI11	Provision of additional all traffic lanes in both directions along the entirety of the scheme area.	LT	No	Although some peak period delay (TPR9), which is exacerbated by seasonal traffic demand (TPR10), has been identified within the scheme area, it is not considered that the provision of additional all traffic lanes along the entirety of the scheme area would be proportionate to the transport problems identified.
VI12	Improved highway drainage and surfacing, where appropriate.	ST / MT	Yes	Through improving highway drainage and surfacing, safety for vehicle users (TPO1) and the operational efficiency of the strategic highway network (TPO4) can be improved. It is therefore considered that further investigation into the requirements for improved highway drainage and surfacing should be undertaken.
VI13	Capacity improvement measures on Pont Lesneven, inclusive of the Pensarn and Pont Lesneven Roundabouts.	MT / LT	Yes	It has been noted that there is an existing issue with peak period journey time delay (TPR9) on Pont Lesneven and it is considered that this intervention could improve access (TPO3) and improve the operational efficiency of the strategic highway network (TPO4), addressing the identified issue. The option has therefore been included on the short-list.
VI14	Road safety improvement measures on Pont Lesneven, inclusive of the Pensarn and Pont Lesneven Roundabouts.	MT / LT	Yes	It has been noted that there is an existing collision cluster (TPR3) on Pont Lesneven and it is considered that this intervention could provide a significant improvement to road safety for vehicle users within the scheme area, addressing this issue. The option has therefore been included on the short-list.

Option	Timescale for Delivery	Inclusion on Short-List	Justification	
VI15	Capacity improvement measures at the Johnstown Slips.	MT / LT	Yes	It has been noted that there is an existing issue with peak period journey time delay (TPR9) at the Johnstown Slips. It is considered that this intervention could improve access (TPO3) and improve the operational efficiency of the strategic highway network (TPO4). In addition, capacity improvements could reduce the occurrences of queueing back onto the A40 mainline, having a beneficial impact on road safety at the junction (TPO1). The option has therefore been included on the short-list for further consideration.
VI16	Road safety improvement measures at the Johnstown Slips.	MT / LT	Yes	As there is an existing safety concern relating to queueing vehicles extending back from the Johnstown Slips westbound off-slip onto the A40 mainline, it is considered that road safety measures at this location could have a significant beneficial impact on safety for vehicle users. The option has therefore been included on the short-list.
VI17	Capacity improvement measures at the Travellers Rest junction.	MT / LT	Yes	Although there is limited existing journey time delay recorded at the Travellers Rest junction, it is noted that traffic demand is likely to increase at the junction as developments in the vicinity of the Carmarthen West Link Road come forward. It is therefore considered that further investigation is required at WeITAG Stage Two to understand whether future traffic demand at the junction requires congestion improvement measures to ensure effective operation of the junction
VI18	Road safety improvement measures at the Travellers Rest junction.	MT / LT	Yes	The 'Safety and Speed Limits Review' recorded stakeholder feedback relating to road safety concerns with the operation of the Travellers Rest slip roads. It is considered that this intervention could mitigate this perceived safety concern and should therefore be included on the short-list.
VI19	Stabilisation of the Carmarthen Showground slips.	MT	Yes	Although this intervention does not address a specific TPR, or meet the TPOs, it has been specifically raised during stakeholder consultation as a required measure within the scheme area. It has therefore been included on the short-list for future investigation as part of WeITAG Stage Two.
VI20	Restrictions and rationalisation of parking opportunities for HGVs adjacent to the A40.	MT	Yes	This intervention could improve safety for vehicle (TPO1) and active travel (TPO2) users, as well as improving access (TPO3) to the Forge Restaurant, Lodge and Filling Station. The option has therefore been included on the short-list.
VI21	Capacity improvement measures at the High Street Slips.	MT / LT	No	Although congestion improvement measures at the High Street Slips could provide further operational efficiency to the strategic highway network (TPO4), as there is no significant existing or future journey time delay expected, it is not considered to be proportionate to the problems identified.
VI22	Road safety improvement measures at the High Street Slips.	MT	Yes	Three collisions have been recorded on the High Street Slips westbound off-slip and it is therefore considered that a road safety improvement measure could be investigated further at this location.
VI23	Capacity improvement measures at the St Clears Roundabout.	MT / LT	Yes	It is considered that capacity improvements could address the journey time delay identified at the St Clears Roundabout during the peak season of traffic demand (TPR10). The option has therefore been included on the short-list.
VI24	Road safety improvement measures at the St Clears Roundabout.	MT / LT	No	This intervention is not considered to meet any of the TPOs, due to there being no significant safety concern identified at this stage at the St Clears Roundabout. It is therefore not considered appropriate to investigate this option in further detail, at this stage.
VI25	Strategic link road to the south and east of Carmarthen, linking White Mill (east) to the A40 west of Carmarthen, via the A48.	LT	Yes	This option could potentially meet a number of the TPOs (TPO1, TPO3, TPO4, TPO5), and is therefore considered suitable for further investigation. The need and feasibility of such an intervention with reference to the benefits should be considered further at WeITAG Stage Two.
VI26	Improved westbound signage in the vicinity of the Tenby Road Filling Station.	ST	Yes	It is considered that this intervention could reduce the potential for collisions westbound in the vicinity of the Tenby Road Filling Station (TPO1), providing a permanent solution to replace the temporary signage provided at present. The option has therefore been included on the short-list.
VI27	Introduction of improved, or new, agricultural vehicle warning signs.	ST	Yes	As this intervention has the potential to improve safety for vehicle users (TPO1) through addressing the issue of inconsistent slow-moving vehicles within the scheme area (TPO4), it has been included on the short-list.
VI28	Speed limit and signage review in the vicinity of the St Clears Roundabout.	ST	Yes	A review of speed limits and signage within the vicinity of the St Clears Roundabout has the potential to reduce vehicle speeds, improving safety for vehicle users (TPO1). On this basis, the option has been included on the short-list.
VI29	Introduction of street lighting, where appropriate.	ST	Yes	It is considered that this intervention could improve safety for vehicle (TPO1) and active travel (TPO2) users, and has therefore been included on the short-list.
VI30	Improvements to alternative and diversion routes.	MT	Yes	This option has the potential to partially address the poor scheme area resilience identified as TPR11 and is therefore considered appropriate for further investigation as part of a WeITAG Stage Two study.
VI31	Introduction of a hard shoulder.	LT	Yes	This intervention would reduce the potential for vehicles suffering engine issues being stranded in live traffic lanes, improving safety for vehicle users (TPO1) as well as improving scheme area resilience (TPR11). It is also considered that a hard shoulder could improve emergency service vehicle access to the proposed West Wales hospital. It is therefore considered appropriate to include on the short list for further investigation, where potential constraints such as land availability and engineering challenges would be considered in further detail.
VI32	Introduction of air quality monitoring sites.	ST	No	Whilst this option could assist in developing future-proofing strategies and future monitoring, it is not related to any of the TPRs. On this basis, it is not considered suitable for inclusion in a short-list for further investigation; however, it could be included as a supplementary measure at future stages.
VI33	Introduction of noise mitigation and/or improvement measures.	ST	Yes	Whilst this intervention is not considered to directly benefit any of the key transport problems identified within the scheme area, it is noted that there are a number of noise priority areas located within the scheme area. It is therefore considered that measures to reduce the impact of noise may be appropriate to deliver alongside interventions that address the key transport problems in the area, and therefore this intervention has been considered on the short-list.
<i>Smart Highways</i>				
SH1	Introduction of VA warning signs.	ST	Yes	This option could provide drivers with information that could improve the user experience and safety (TPO1) of the scheme area. It is therefore deemed suitable for inclusion on the short-list, with further investigation into associated infrastructure requirements (such as existing ITS provision) forming part of a WeITAG Stage Two study.

Option		Timescale for Delivery	Inclusion on Short-List	Justification
SH2	Introduction of an automated variable speed limit, inclusive of associated infrastructure.	LT	No	This option could potentially provide better control of vehicular traffic in order to improve traffic flow and air quality in the scheme area. It is noted however, that no significant large-scale traffic flow congestion or air quality issues have been identified within the scheme area, and it is considered that the intervention would be a disproportionate measure. It is not considered that this option should be considered any further at this stage.
SH3	Introduction of variable information boards.	ST / MT	Yes	This intervention would enable to drivers to plan their onward journeys based on the information displayed. In addition, information could be presented to display the availability and location of electric vehicle charging points, achieving TPO5. On this basis, the intervention has been included on the short-list, with further investigation into associated infrastructure requirements (such as existing ITS provision) forming part of a WeITAG Stage Two study.
SH4	Provision of additional electric vehicle charging opportunities within the scheme area.	MT	Yes	This intervention could improve access for electric vehicle users (TPO3) and assist delivery of the local and national Electric Vehicles Strategy (TPO5). This option is therefore considered a reasonable measure to include on the short-list for further investigation.
SH5	Introduction of high-occupancy vehicle lanes.	MT	No	It is not considered that this intervention would meet the TPOs and it is not considered an appropriate measure within this scheme area. On this basis, it is not considered that this intervention should be considered any further at this stage.
SH6	Introduction of autonomous vehicle infrastructure.	LT	Yes	It is outlined within the Transport Fit for Future Generations document that autonomous vehicles are expected to form a significant proportion of the vehicle fleet in the coming decades and it is considered that a proportionate autonomous vehicle intervention could assist in future-proofing the scheme area (TPO5). This intervention is therefore considered a reasonable measure to include on the short-list for future investigation.
SH7	Amendments to tax regimes relating to alternative fuel vehicles (such as electric vehicles).	LT	Yes	Through amending the tax regimes relating to electric vehicles, it is considered that this could present a new revenue opportunity for the Welsh Government which could support delivery of the local and national Electric Vehicles Strategy (TPO5). It is therefore considered that alternative fuel vehicles' tax regimes should be further investigated to determine the most appropriate measures.
SH8	Introduction of a dynamic road user charging regime for visitors to the area.	LT	Yes	It is considered that this intervention could present a new revenue stream for the Welsh Government which could enable further funding to assist delivery of the emerging aspirational public transport and electric vehicles schemes (TPO5). It is therefore considered that there is merit in further investigating the deliverability and mechanisms of such an intervention.
<i>Freight</i>				
FR1	Prioritise the movement of freight by rail, as oppose to road-based methods.	LT	Yes	It is considered that this measure could potentially lead to a reduction in road-based freight through the scheme area, which could have a beneficial impact on safety for vehicle users (TPO1), improve the operational efficiency of the scheme area (TPO4) and assist in decarbonisation of the economy. This option is therefore considered a reasonable measure to include on the short-list for further investigation.
FR2	Restrict HDVs from accessing the outside lane of the A40.	ST	No	Whilst this option may have a minor benefit to road safety (TPO1), it is not considered to be significant and is likely to be challenging to enforce. It is also noted that the option does not achieve any of the TPOs. On this basis, it is not considered that this option should be considered further at this stage.
FR3	New HGV parking site at the Carmarthen Showground.	MT	Yes	This option could assist in addressing TPR5, through providing alternative parking opportunities away from the existing sub-standard laybys within the scheme area. On this basis, it is considered that this option should be investigated further.
FR4	Improved HGV restriction signage.	ST	Yes	This intervention could address the safety concern identified by a stakeholder of HGVs re-routing through Llanllwch during peak period queueing at the Johnstown Slips. It is therefore considered appropriate to include this intervention on the short-list.
<i>Managing Demand</i>				
MD1	Compose a new regional Travel Planning Strategy.	LT	Yes	This would facilitate a coherent approach to new development in the area, maximising the opportunity for facilitating sustainable modes of travel. It is therefore considered appropriate as a measure for further investigation.
MD2	Introduction of dynamic road user charging.	LT	Yes	It is considered that through introducing road user charging the traffic demand could be reduced both locally and nationally, encouraging a shift towards more sustainable modes of travel which will reduce transport emissions, in line with the aspirations set out within the Prosperity for All: A Low Carbon Wales document.
MD3	Promotion of changes to working practices.	ST / MT / LT	Yes	The promotion of changes to working practices, such as working from home, could reduce traffic demand in the area, having a beneficial impact on access (TPO3) and the operational efficiency of the strategic highway network (TPO4). This intervention has therefore been included on the short-list.

Table 3-2 Determination of Short-List

4. Delivery, Financial and Commercial Case

4.1. Overview

WeITAG prescribes that prior to completion of WeITAG Stage Three, the Five Cases (Strategic, Transport, Financial, Commercial and Management) will need to be completed. However, at this early stage of the study it is only the Strategic Case that should be fully developed, alongside a qualitative appraisal in the Transport Case. Therefore, this WeITAG Stage One report provides a broad summary of the outstanding cases that will be completed as part of WeITAG Stage Two and Three.

4.2. Financial Case

The Financial Case identifies whether an option is affordable at construction and in the long-term, covering both capital and revenue requirements over the life-time of an option. It will also outline the sources of funding, inclusive of a risk register and details on which sector of the economy the funding will be supplied from, and any potential capital or revenue shortfalls.

The costs of the options have not been considered in this WeITAG Stage One study, as this is not considered to be a key differentiator at this stage of the process. The Financial Case will therefore be developed at WeITAG Stages Two and Three.

4.3. Commercial Case

The Commercial Case demonstrates whether an option is commercially viable and whether it is possible to procure the scheme and continue with it in the future. Of particular note, the Commercial Case focuses on the relationship of the private sector with an option and outlines the expected key contractual arrangements for procurement.

At this stage of WeITAG, the Commercial Case has not been developed; however, as the Strategic Highway Authority, SWTRA have a significant amount of experience at successfully procuring construction works and therefore this aspect of the Commercial Case is not expected to be complex.

The Commercial Case will be developed at WeITAG Stages Two and Three.

4.4. Management Case

The Management Case outlines whether an option is deliverable at construction and over the scheme life-time. It covers the procurement, construction and on-going operation, as well as details of the monitoring arrangement and the Review Group. The Management Case should embed the five ways of working identified within the Well-being of Future Generations (Wales) Act.

Although the full Management Case will be developed at WeITAG Stages Two and Three, it is noted that a Review Group has been established as part of this WeITAG Stage One, including the following:

- Welsh Government;
- SWTRA; and
- Atkins.

The Review Group is responsible for disaggregating the information presented within the WeITAG Stage One report, before actioning the required steps for progressing.

5. Recommendations of Next Steps

5.1. Overview

This WeITAG Stage One study has reviewed the existing transport context within the scheme area and identified that there are key transport problems that justify the need for a scheme. The accompanying IAR presents information which evidences the development of the TPOs which are summarised within this WeITAG Stage One report.

A range of potential measures have been developed within the options long-list and appraised against how they meet the Transport Planning Objectives and well-being goals. It is considered that there is a short-list of options that are appropriate for further investigation in how they could potentially address the Transport Problems.

5.2. Next Steps

Consideration has been given as to how the measures could be developed and, in order to assist the Review Group in establishing the priority of schemes going forward, a series of work packages are recommended to cover different areas of the short-list.

It is acknowledged that there may be some overlap with WeITAG work packages from studies on adjoining routes (such as A48 Cross Hands to Pensarn) and this will need to be considered as the studies develop.

A potential approach to progressing the analysis of the short-list, arranged in the recommended order of priority, is illustrated in **Figure 5-1**, with the description of the work packages provided in **Table 5-1**.

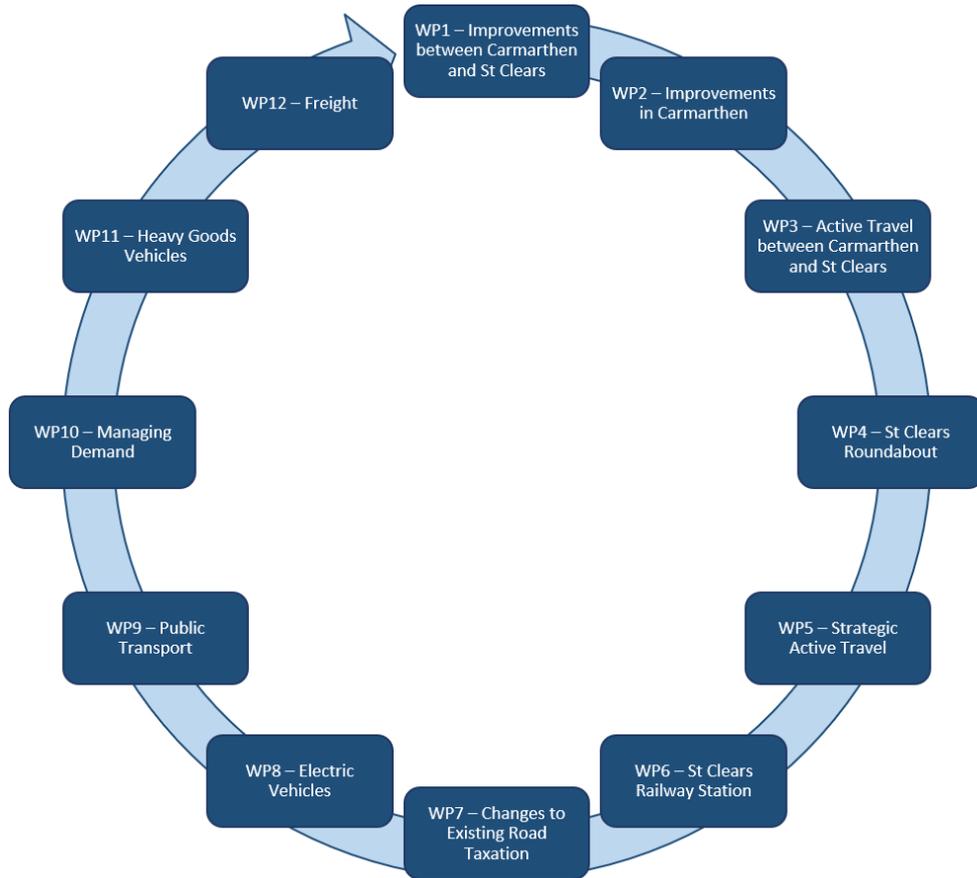


Figure 5-1 Potential Work Packages

Work Package	Option Ref.	Next Step	Description
<i>Improvements between Carmarthen and St Clears</i>			
WP1	PT3	Undertake a WeITAG Stage Two relating to 'A40 Carmarthen to St Clears'	<p>It is considered that the short-list options included within this work package have the potential to address a significant number of the transport problems identified within the scheme area; in turn achieving all TPOs set within this WeITAG Stage One study. On the basis that these short-list options could have the potential to address the known transport problems, particularly associated with safety for vehicle users, it is considered that this work package is of priority one.</p> <p>In order to progress the work package, it is recommended that a WeITAG Stage Two study is undertaken for the scheme area between the Travellers Rest (J5) junction and the St Clears Roundabout (J41), assessing the suitability of the short-list options to determine a preferred scheme. It is noted that this work package would primarily focus on the A40, although there would be significant engagement required with the Local Highway Authority to ensure appropriate measures are adopted; in line with the five ways of working set out in the Well-being of Future Generations (Wales) Act. In addition, the WeITAG Stage Two study would need to consider the emerging South-West Wales Metro and Electric Vehicles Strategy (TPO5) to ensure the preferred option does not prejudice delivery of either aspirational scheme, while future-proofing the scheme for autonomous vehicles (SH6) will also be a consideration.</p> <p>Although the short-list option would need to be considered across the scheme area in its entirety, it may be beneficial to disaggregate the scheme area into separate deliverable areas to reflect the priority of schemes. The priority of these separate deliverable areas could be split as follows, on the basis of potential delivery timescales:</p> <p style="padding-left: 40px;">Meidrim (J14) to Bancyfelin (J19); Market Hall Vets (J6) to Golf Club / Private Access (J13); and Private Access (J20) to High Street Slips (J40).</p> <p>It is also considered that this work package would need to consider WP3 in order to ensure that any preferred scheme does not prejudice delivery of improved active travel linkages within the scheme area.</p>
	PT4		
	PT7		
	VI1		
	VI3		
	VI4		
	VI5		
	VI6		
	VI8		
	VI19		
	VI20		
	VI22		
	VI26		
	VI27		
	VI29		
	VI30		
	VI31		
VI33			
SH1			
SH3			
SH6			

Work Package	Option Ref.	Next Step	Description
<i>Improvements in Carmarthen</i>			
WP2	PT1	VI17	<p>The vast majority of vehicle delay (TPR9 and TPR10) within the scheme is experienced to the east of the Travellers Rest (J5) junction, while there is also a notable collision cluster (TPR5) on Pont Lesneven as well as a known safety concern at the Johnstown Slips (J4). It is therefore considered that implementation of the relevant short-list options in this location could achieve TPO1, TPO3, TPO4 and TPO5, providing a significant benefit to vehicle travel in Carmarthen.</p> <p>In addition to providing a range of benefits to Carmarthen, it is considered that improvements to vehicle travel through this section of the scheme area could provide a significant benefit to the wider region, such as the tourism and port industries in Pembrokeshire.</p>
	PT2	VI18	
	VI1	VI25	
	VI3	VI27	
	VI5	VI29	
	VI6	VI30	
	VI8	VI31	
	VI10	VI33	
	VI12	SH1	
	VI13	SH3	
	VI14	SH6	
	VI15	FR4	
VI16			
<i>Active Travel between Carmarthen and St Clears</i>			
WP3	AT1	AT9	<p>It has been identified that there is currently an aspiration to develop a direct active travel route between Carmarthen and St Clears to facilitate a modal shift. It is therefore considered that implementation of the relevant short-list options could improve active travel linkages within the scheme and wider area (TPR7) and improve safety (TPO2) while also supporting delivery of the aspirational active travel route between Carmarthen and St Clears.</p> <p>As part of considering AT3 and AT4, it is envisaged that this work package would investigate the appropriateness of the CCC ERM and INM routes that run parallel to the scheme area; while WP5 will further investigate the CCC ERM and INM routes in the wider area.</p> <p>It is considered that this work package could be most effective if undertaken con-currently with WP1, in order to ensure any impacts on active travel linkages within the scheme area are addressed appropriately. This being said, as the objectives of the studies would differ, it is considered that the studies should be considered as separate work packages.</p>
	AT2	AT11	
	AT3	AT12	
	AT4	PT7	
	AT5	VI1	
	AT6	VI3	
	AT7	VI29	
	AT8		

Work Package	Option Ref.	Next Step	Description
<i>St Clears Roundabout</i>			
WP4	VI3	Undertake a WeITAG Stage Two relating to 'St Clears Roundabout'	<p>The review of the existing and future situation within the scheme area identified that the St Clears Roundabout experiences notable journey time delay, namely on the A477 arm, during the peak season (TPR10). It has also been identified that a review of signage and speed limits is required to improve the awareness of the junction for drivers on the A40 West arm of the junction.</p> <p>On this basis, it is considered that a focused WeITAG Stage Two study would be of benefit, to further understand the existing constraints at the junction and to consider the appropriateness for an intervention which could achieve TPO3, TPO4 and TPO5. In order to ensure any intervention at the junction does not only consider private vehicle users, the WeITAG Stage Two study would need to consider the integration of an intervention with the emerging South-West Wales Metro and Electric Vehicles Strategy.</p>
	VI10		
	VI23		
	VI28		
	SH1		
	SH3		
	SH6		
<i>Strategic Active Travel</i>			
WP5	AT3	Strategic Review of Active Travel Provision	<p>It is considered that the short-list options included within this work package should feed into a wider area strategic review of active travel provision within the vicinity of the strategic highway network. In close collaboration with CCC, it is considered that a strategic review of the existing active travel provision on the strategic highway network in the region could assist in identifying any wider area active travel measures, as well as ensuring a consistent approach to active travel across the strategic highway network.</p> <p>It should be noted that the other WeITAG Stage Two work packages will consider active travel provision, however it is considered that this strategic review of active travel provision will ensure a joined-up approach across the region can be achieved. It is noted that this strategic review could be undertaken alongside work currently being undertaken by the Local Authorities in the region to update the Active Travel Wales maps in line with national policy.</p>
	AT4		
	AT8		
	VI29		

Work Package	Option Ref.	Next Step	Description
<i>St Clears Railway Station</i>			
WP6	PT8	Undertake a combined WeITAG Stage One / Two relating to 'St Clears Railway Station'	<p>A potential new railway station in the vicinity of St Clears has been identified within the National Transport Finance Plan (RI10) and further investigation into the feasibility of the facility has recommended a WeITAG Stage One is undertaken. Despite this, it is considered that a combined WeITAG Stage One / Two study would be more appropriate as this could investigate the potential cost implications and value for money of the potential options in more detail than a WeITAG Stage One in isolation. It is considered that the Case for Change within the WeITAG report could be formed from the work previously undertaken as part of investigations into the suitability of a potential new railway station at St Clears.</p> <p>It is considered that the South-West and Mid-Wales Transport Model (TfW), expected to be completed by the end of 2020 could be used to test the wider area transport impacts of the proposed St Clears Railway Station. It is also noted that the potential development of the St Clears Railway Station will need to be considered in the context of the South-West Wales Metro (WP9).</p>
<i>Changes to Existing Road Taxation</i>			
WP7	SH7	National consideration of changes to the existing road taxation system	It is considered that there is an opportunity to investigate dynamic road user charging across Wales to ensure drivers pay an appropriate taxation based on their impact on congestion and air / noise pollution. It is also considered that any introduction of road user charging could potentially consider the introduction of road user charging for visitors to Wales, which is of specific relevance to the scheme area due to its location as a key link for tourist traffic towards Pembrokeshire.
	SH8		In addition to road user charging, it is considered that amendments to tax regimes are required to ensure alternative fuel vehicles can be taxed appropriately to ensure Welsh Government maintain a significant revenue stream. Although this measure can be considered in full detail within the national Electric Vehicles Strategy (WP8), it is considered that inspection into the potential amendments to alternative fuel vehicles' tax regimes could form part of a wider consideration of changes to existing road taxation.
	MD2		It should be noted that any changes to taxation will need to be considered at a national scale.

Work Package	Option Ref.	Next Step	Description
<i>Electric Vehicles</i>			
WP8	SH3	Electric Vehicles Strategy	It has been identified during stakeholder consultation that both a local and national Electric Vehicles Strategy is currently under development. On this basis, it is considered that options SH4 and SH7 could be considered as part of the development of these strategies. It should however be noted that provision for electric vehicles would be considered as part of all WeITAG Stage Two work packages, in order to ensure that any scheme progressed to WeITAG Stage Three does not prejudice delivery of the Electric Vehicles Strategy. Whilst this has a low priority in terms of the works packages identified from this WeITAG study, it is understood that the development of the local and national strategies is understood to be imminent.
	SH4		
<i>Public Transport</i>			
WP9	AT8	South-West Wales Metro	The South-West Wales Metro is currently under development and is expected to include improvements to multi-modal infrastructure and public transport service enhancements. On this basis, it is considered that the short-list options identified as part of this work package could be considered in further detail within the current concept development of the South-West Wales Metro.
	PT1		
	PT2		
	PT5		
	PT6		
	PT7		
	PT9		
	PT10		
<i>Managing Demand</i>			
WP10	MD1	Travel Demand Strategy	It is considered that a Travel Demand Strategy could be produced as part of delivering options MD1 and MD3 to cover the Swansea Bay City Region, in addition to making reference to the WeITAG Stage One study undertaken within the neighbouring scheme area of the A48 Cross Hands to Pensarn. It is considered that MD1 would ensure an integrated and coherent approach to development in the region, encouraging use of sustainable travel modes so far as is reasonably practical, while MD3 can further discourage road users from travelling using the private car.
	MD3		

Work Package	Option Ref.	Next Step	Description
<i>Heavy Goods Vehicles</i>			
WP11	FR3	Lorry Parking Strategy	<p>The A48 Cross Hands to Pensarn and M4 J35 Pencoed to J49 Pont Abraham WeITAG Stage One study recommended development of a Lorry Parking Strategy for the study area considered.</p> <p>As the A40 Carmarthen to St Clears scheme area can be considered as an extension of the strategic highway network from Carmarthen to the west, providing a key route onwards towards the strategic ports in Pembrokeshire, the Lorry Parking Strategy could be extended to cover this scheme area. Option FR3 could be considered within further detail in this Lorry Parking Strategy.</p>
<i>Freight</i>			
WP12	FR1	Rail Freight Strategy	<p>The A48 Cross Hands to Pensarn and M4 J35 Pencoed to J49 Pont Abraham WeITAG Stage One study recommended development of a Rail Freight Strategy for the study area considered.</p> <p>As the A40 Carmarthen to St Clears scheme area can be considered as an extension of the strategic highway network from Carmarthen to the west, providing a key route onwards towards the strategic ports in Pembrokeshire, a Rail Freight Strategy would need to consider the impact of shifting freight onto rail (FR1) within this scheme area. It is therefore considered appropriate to extend the Rail Freight Strategy to consider the implications of a shift towards rail freight on the scheme area considered as part of this WeITAG Stage One study.</p>

Table 5-1 Work Package Delivery

5.3. Review Group Resolutions

The draft Stage One report has been reviewed and discussed at a review group meeting. Whilst all the proposed work packages were considered appropriate, it is acknowledged that a number of the work packages would be taken forward under different work programmes. However following discussion, it has been agreed that the recommended commissions that are to progress within the current works programme include:

- Development of a WeITAG Stage Two study for the A40 Carmarthen to St Clears scheme area, inclusive of active travel considerations (namely rationalisation of PRow) and corridor-wide improvements. This WeITAG Stage Two study would need to consider any schemes developed as part of the Western Gateway study outlined below; and
- Development of a WeITAG Stage Two study for the Western Gateway to Carmarthen (between Travellers Rest and Carmarthen), to incorporate active travel considerations, potential safety improvement measures and delay reduction measures.

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