

Welsh Government
**A40 Penblewin to Redstone Cross
Improvements**

WelTAG Stage 3 Report

A40PRC-ARP-GEN-SWI-RP-J-0001

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1 Executive Summary

1.1 Overview

- 1.1.1 Welsh Transport Appraisal Guidance (WelTAG) ensures a clear audit trail of decision-making, providing the justification for the promotion, or otherwise, of transport options. It provides decision-makers with all the information they require to make a reasoned and auditable decision on all funding decisions.
- 1.1.2 This report provides a concise summary of the work undertaken during Stage 3 of this study. The Stage Report sets out the key findings from the detailed evidence collected and makes reference to the location of the detailed evidence behind the statements made.
- 1.1.3 The need for change is derived from a strategic priority for improved transport connections in West Wales to support economic prosperity, and contribute to the economic, social, cultural and environmental well-being of current and future generations.
- 1.1.4 This WelTAG Stage 3 Report provides a Full Business Case for the proposed A40 Penblewin to Redstone Cross Improvements.

1.2 Project context

- 1.2.1 The Scheme sits within proximity to a number of recent and proposed improvements to the transport system including the following schemes of key relevance.
- 1.2.2 A road improvements scheme between Penblewin and Slebech Park was completed in 2011, comprising of a road widening scheme to provide overtaking opportunities and improve safety. The scheme includes a bypass for Robeston Wathen and a replacement bridge over the River Cleddau.

- 1.2.3 A road improvements scheme between Llanddewi Velfrey and Penblewin is currently under consideration. Welsh Government have received the Inspector's report and are considering the recommendations made. The proposed scheme comprises a wide single 2+1 carriageway and would bypass the community of Llanddewi Velfrey. A Public Inquiry was held in March 2020 following the publication of Draft Orders and the supporting Environmental Statement.
- 1.2.4 A Stage 1 and 2 WelTAG Study has also been carried out focusing upon sustainable transport options within Narberth¹.

1.3 The problems and need for the Scheme

- 1.3.1 The A40 trunk road forms part of the Trans-European Transport Network (TEN-T) and is a strategically important link between the national motorway network and the West Wales ports including Milford Haven, Fishguard and Pembroke Dock. There are existing and planned strategic developments that rely on the efficient movement of people and goods, including at the Haven Waterway Enterprise Zone and the major new urgent and planned care hospital.
- 1.3.2 However, the A40 forms the lowest standard section of the TEN-T in the UK and the surrounding area suffers from lower than average levels of employment, productivity, investment and attainment. Business surveys raise concerns about poor journey time reliability, vehicle platooning and lack of safe overtaking opportunities. Stakeholder engagement has shared how improvements to the A40 are considered essential to reduce isolation, increase tourism and connectivity to employment opportunities. Local public exhibitions and consultations have also helped local people express concerns about the need for improving walking and cycling connections.
- 1.3.3 A number of problems have been identified along the Penblewin to Redstone Cross corridor, in collaboration with the A40 Llanddewi Velfrey to Penblewin Improvements study, the Review Group and informed by stakeholder engagement. The problems are:

¹ Copies can be accessed from Pembrokeshire County Council upon request.

- P1** The A40 Redstone Cross Junction is below modern design standards. Poor visibility and substandard junction layout can lead to severe road accidents.
- P2** Limited overtaking opportunities lead to poor journey time reliability and driver frustration.
- P3** Occasional convoys of heavy goods vehicles from the ferry ports and slow-moving agricultural vehicles can contribute to period of platooning and journey time unreliability, which is exacerbated with limited overtaking opportunities.
- P4** Seasonal variations in traffic volumes along the A40 especially during the summer months can lead to slow moving traffic causing journey time unreliability, which is exacerbated with limited overtaking opportunities.
- P5** There are many side road junctions and direct accesses to properties and agricultural fields off the A40, which can contribute to operational problems along the road.
- P6** A mix of traffic types using the road, can contribute to journey time unreliability and driver frustration, risky manoeuvres and collision incidents.
- P7** A lack of strategic public transport connectivity in Pembrokeshire generally means there is a dependence on the private car for inter-urban connections.

1.3.4 Problems P3 and P4 are recognised as being temporal in nature; with problem P3 occurring when convoys of heavy goods vehicles or slow-moving agricultural vehicles contribute to periods of platooning and journey time unreliability, and P4 occurring largely within the summer months. It is considered that the other problems are more permanent in nature, owing to the substandard design and operation of the road.

1.3.5 Problems P2, P3, P4, P6 and P7 affect the whole A40 corridor between St Clears and Haverfordwest. Provision of overtaking lanes along the A40 between St Clears and Haverfordwest is 13% of its total 32.5km length. This is well below the 30% ratio advised for this type of route.

- 1.3.6 The A40 accommodates a mix of traffic types, with seasonal variations. The A40 is a main route for the agriculture sector and this does present problems with tractors moving between fields, tractors towing trailers and the movement of agricultural produce and livestock on the highway. There are numerous side road junctions and a high number of direct accesses to property and fields.

1.4 The Objectives

- 1.4.1 The objectives seek to address the problems, as well as respond to the strategic issues identified in national and local policy and programmes e.g. the need to improve connectivity to the Enterprise Zone and City Region. In developing the objectives, a review was also undertaken against the well-being goals as presented within the Well-being of Future Generations (Wales) Act 2015. They are:

- O1** To enhance network resilience and improve accessibility along the east-west transport corridor to key employment, community and tourism destinations.
- O2** To improve prosperity and provide better access to the county town of Haverfordwest, the Haven Enterprise Zone and the West Wales ports at Fishguard, Milford Haven and Pembroke Dock.
- O3** To reduce community severance and provide health and amenity benefits.
- O4** To improve the Redstone Cross Junction safety (including perceived safety) and reduce the number and severity of collisions.
- O5** To promote active travel by cycling, horse riding and walking to provide opportunities for healthy lifestyles.
- O6** To deliver a Scheme that promotes social inclusion and integrates with the local transport network to better connect local communities to key transport hubs.
- O7** Deliver a project that is sustainable in a globally responsible Wales, taking steps to reduce or offset waste and carbon.

- O8** Give due consideration to the impact of transport on the environment and provide enhancement when practicable

1.5 The Options

- 1.5.1 Options were identified through a wide range of historic and more recent technical assessments and stakeholder engagement exercises. Appraisal of different identified options considered how the problems and objectives would be addressed, as well as key risks, adverse impacts, constraints and dependencies.
- 1.5.2 The Welsh Government determined that doing nothing would not be acceptable as it would lead to the problems continuing and worsening. A local public transport option was considered but deemed that it was not able to address the problems given the types of journey being undertaken on the A40 in the area and a lack of suitability for traffic to shift modes.
- 1.5.3 The Welsh Government is separately progressing its regional plans for public transport improvements, which are better suited for addressing regional issues and opportunities in the longer term (but would not address most of the identified transport problems on the A40 west of St Clears).
- 1.5.4 The appraisal process led to the recommendation to progress variations of a highway option given that this would best address the problems and achieve the objectives. Further appraisal involved the assessment of four different variations of potential route alignments and junction strategies. Two of these variations were appraised to best address the problems, achieve the objectives and align best with the majority of cultural, social and economic appraisal criteria albeit with some adverse impacts on the environment.
- 1.5.5 A further appraisal of the two final options led to the preferred option being chosen based on feedback from politicians and local stakeholders. The preferred option was chosen on the basis of perceived safety and journey time reliability benefits, with slight changes based on feedback from stakeholders and the public who expressed a preference for a junction being retained at Redstone Cross. The preferred option was also considered to offer the greatest opportunities for safe walking, cycling and horse-riding (WCHR) improvements along the existing A40.

- 1.5.6 For this reason, this WelTAG Stage 3 full business case focuses on the preferred option, herein referred to as ‘the Scheme’.

1.6 The Scheme and its Impact

- 1.6.1 The Scheme comprises a new 1.8km offline route between Penblewin and Redstone Cross. It includes a proposed improved section of trunk road, consisting of two lanes in one direction, to allow overtaking, and one lane in the opposite direction.
- 1.6.2 The existing section of the A40 road between Penblewin Roundabout and Redstone Cross would be reclassified and cease to be a trunk road, reverting to the local authority. With the bypass of Redstone Cross taking traffic off the existing A40, there will be reduced interface between traffic on the existing A40 and Walkers, Cyclists and Horse Riders (WCHRs).
- 1.6.3 It would provide a safe and convenient access route to the north of Narberth and would reduce the potential of accidents, particularly at Redstone Cross. The benefits of this would be improved active travel connectivity between Narberth and adjacent communities, reducing severance and providing opportunities for healthy lifestyles and promoting social inclusion.
- 1.6.4 The Scheme would improve network resilience and improve accessibility along the east-west transport corridor including enhancing connections with key employment, community and tourism destinations, and therefore contributing positively to prosperity. It is acknowledged that the Scheme may have adverse impacts on noise, greenhouse gases, landscape, historic environment, biodiversity, and water quality. Where possible these will be suitably mitigated.

1.7 Cost and Value for Money

- 1.7.1 The cost estimate is £23,021,469.39 (excluding VAT and inflation to completion).
- 1.7.2 The Benefit-Cost Ratio (BCR) for the Scheme is 0.26 which indicates that the costs of the scheme outweigh the quantifiable benefits. However, the quantitative economic analysis does not capture all of the expected benefits of the Scheme. Benefits in relation to enhanced network resilience, improved prosperity and reduced community

severance are only partially reflected.

1.7.3 For example, the A40 is not forecast to be congested during typical operational conditions but instead experiences journey time reliability problems outside of typical operating conditions e.g. temporarily when there are agricultural vehicles or ferry traffic in platoons. That is not to say there are not likely journey time reliability benefits to be had but they cannot be captured as part of the traffic model and as such cannot be quantified.

1.7.4 Furthermore, the BCR is not the only indicator of value for money, particularly for smaller scale schemes that achieve a broad range of objectives, which is the case here. It should also be considered that the Scheme needs to be seen in the context of the overall A40 corridor improvement, of which it forms an integral component.

1.8 Well-being of Future Generations (Wales) Act 2015

1.8.1 The preferred option performs well against the scheme objectives, and as such is expected to contribute positively to the well-being goals and objectives. A review was undertaken of the preferred option to help demonstrate how its implementation would contribute to the well-being goals, by considering the Welsh Government's well-being objectives.

1.8.2 The Scheme would result in opportunities to help achieve the well-being objectives, thus aligning positively to the cross-cutting strategies, contributing to the well-being goals, and helping Welsh Ministers satisfy their duties and obligations under the 2015 Act. Please see the Scheme's Sustainable Development Report (SDR) for more information.

1.8.3 A review was also undertaken as to how the project would embed the five ways of working. The Welsh Government is committed to working in accordance with the sustainable development principle and it sets out several requirements for its future Contractor that are considered to be aligned to the five ways of working as defined in the 2015 Act.

1.9 Management

- 1.9.1 The Management Case considers delivery arrangements for the project to include management during the lifetime of the project moving forward. It demonstrates that the project is achievable and outlines the arrangements that have been put in place or will be considered further at the next stage. This case would be updated on the procurement of a Contractor.
- 1.9.2 The detailed design and construction programme allows for a potential Public Local Inquiry in 2020 with a decision to proceed likely in early 2021. Detailed design and construction works are currently planned to commence in Summer 2021 and continue for approximately 18 months. Maintenance and aftercare of the environmental aspects of the Scheme remain the responsibility of the Contractor for five years after the completion of the works (likely to be up to 2026).

1.10 Financial

- 1.10.1 The Financial Case considers the affordability and long-term financial viability of the option(s). Consideration is given to both capital and annual revenue requirements. This case would be updated on the procurement of a Contractor.
- 1.10.2 Capital costs will be funded jointly, with the allocation of funding being one third Welsh Government and two thirds European Regional Development Fund (ERDF). Following the acceptance of a Business Case prior to the ECI contract, WEFO have confirmed that ERDF funding for the scheme is secured, despite 'Brexit' and the UK's withdrawal from the European Union.
- 1.10.3 The cost estimate may change with the appointment of a Design and Build Contractor and could potentially reduce.
- 1.10.4 It is anticipated that much of the cost could be spent in Wales, of which about half could be spent in the local area.

1.11 Commercial

- 1.11.1 The Commercial Case considers whether it will prove possible to procure the Scheme and then continue with it into the future. The case considers the level and type of involvement from the private sector, as well as potential effects on the on-going viability of the option/Scheme. This case would be updated on the procurement of a Contractor.
- 1.11.2 As reported in WelTAG Stage 2, the Welsh Government initially appointed Carillion as the Contractor responsible for construction for the Design Development phase under an Early Contractor Involvement (ECI) form of Contract. This provided an advantage with the Carillion team being involved early in the development stage; bringing their buildability expertise to influence the design development and to manage costs. Since their termination of involvement at the end of WelTAG Stage 2, they will not carry this through to the construction phase. Since their involvement has ceased, the Welsh Government have decided to follow EU Procurement regulations for the tender of a Design and Build Contract, following successful completion of the Statutory Process (Key Stage 4).

1.12 Next steps

- 1.12.1 It is considered that sufficient evidence has been presented to demonstrate that the Scheme is the option which best addresses the identified problems and would achieve the objectives, as well as contributing to the well-being goals and objectives. It could be delivered within technical and financial constraints. In light of this, it is the preferred option.
- 1.12.2 Following publication of the draft Orders, there is an opportunity for any individual or organisation to support, comment or object to the draft Orders, put forward alternatives or comment on the Environmental Statement (ES).
- 1.12.3 The Welsh Government would consider all of the responses received on the draft Orders prior to deciding whether the Scheme should proceed to a Public Local Inquiry (PLI). The Welsh Ministers would consider all issues before deciding whether to proceed with the Scheme and make the Orders with/without changes.

- 1.12.4 Should the Welsh Ministers decide to proceed with the Scheme, then at the next stage of the WelTAG process, Stages 4 and 5 will record what happens so that lessons can be learnt. It may lead to alterations to the current Scheme and will form valuable evidence for use in future WelTAG appraisal.

2 Introduction

2.1 Context

- 2.1.1 The Welsh Transport Appraisal Guidance (WelTAG)² was first published in 2008 and was updated with new WelTAG guidance published in December 2017³.
- 2.1.2 WelTAG ensures a clear audit trail of decision-making, providing the justification for the promotion, or otherwise, of transport options. It is the mechanism for providing decision-makers with all the information they require to make a reasoned and auditable decision on all funding decisions.
- 2.1.3 As well as embedding the Well-being of Future Generations (Wales) Act 2015 (the WFGA), WelTAG combines the principles of the HM Treasury Green Book and the Five Case Model for Better Business Cases, with WelTAG best practice for transport appraisal.
- 2.1.4 The Welsh Government has decided to progress a WelTAG 2017 Stage 3 study into possible transport improvements to the section of A40 between Penblewin and Redstone Cross (the ‘Scheme’).

2.2 Approach

- 2.2.1 This report presents the WelTAG Stage 3 Report Full Business Case (FBC) for the A40 Penblewin to Redstone Cross Improvements. It is a non-technical document that provides a summary of the key issues and results associated with the appraisal, to help inform decision making. Full and technical details of the evidence base and analysis work undertaken is presented within the associated WelTAG Stage 3 Impact Assessment Report (IAR)⁴.
- 2.2.2 The combined WelTAG Stage 1 and 2 Study Stage Report are appended to this Stage 3 Report and is included in Appendix A. Whilst the WelTAG Stage 1 and 2 appraisals are summarised when appropriate within this Stage 3 Report, Appendix A provide the reader with the full audit trail of appraisal.

² <http://gov.wales/docs/det/policy/140923-weltag-guidance-en.pdf>

³ <https://beta.gov.wales/sites/default/files/publications/2017-12/welsh-transport-appraisal-guidance.pdf>

⁴ Ove Arup and Partners (2020) WelTAG Stage 3: Penblewin to Redstone Cross Improvements Impact Assessment Report

2.2.3 This Stage 3 Report presents a full and detailed assessment of the preferred option to inform a decision as to whether or not to proceed to implementation.

2.2.4 In accordance with the WelTAG guidance, a seven-point scale was used in order to appraise the options developed as shown in Table 1.

Table 1 WelTAG Seven Point Assessment Scale

Large Beneficial	+++
Moderate Beneficial	++
Slight Beneficial	+
Neutral	0
Slight Adverse	-
Moderate Adverse	--
Large Adverse	---

2.3 Review Group

2.3.1 As part of WelTAG 2017, involvement is recommended to help shape the identification and appraisal of problems, objectives and possible solutions. WelTAG 2017 specifically requires a Review Group to help steer the appraisal process. A Review Group for the Scheme was established at the outset of the Stage 1 appraisal in order to help ensure that key stakeholders were identified and meet on a regular basis to be involved in any decision making.

2.3.2 The Review Group comprises the Welsh Government's Project Director, in addition to the Employer's Agent, the Designer (Arup supported by RML), and Pembrokeshire County Council (PCC) as the relevant local authority. The Review Group is as outlined in Figure 1.

2.3.3 The Review Group has met at key milestones in each of the WelTAG Stages in order to consider the content of the WelTAG reports and actions to be taken forward to the next stage of the process. The Review Group has played a key role in advising on the methods to be adopted in assessing impacts of the option(s) to be taken forward for subsequent Stages and has make recommendations in relation to any specific additional evidence and/or modelling requirements.

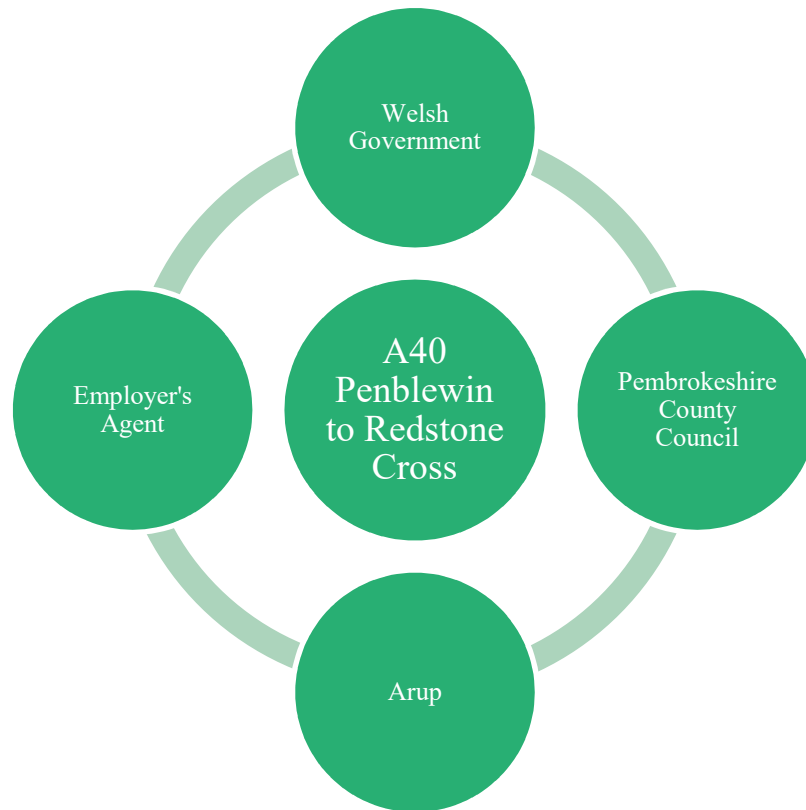


Figure 1 Review Group

2.4 Report Structure

2.4.1 The remainder of this report is presented in line with the WelTAG 2017 guidance and utilises the Five Case Business Model (Five Cases). The report is therefore structured as follows:

- **Section 2: Strategic Case** – presents the context to the appraisal, the problems and objectives and presents option development.
- **Section 3: Transport Case** – considers each option in more detail and explores how these will meet the need identified in the Strategic Case.
- **Section 4: Management Case** – establishes the make-up of the review group and considers, at a high-level, delivery arrangements which may affect the selection of options.
- **Section 5: Financial Case** – considers affordability and long-term financial viability issues that may affect the selection of options.

- **Section 6: Commercial Case** – outlines the commercial considerations.
- **Section 7: Recommendations** – outlines the next steps in the WelTAG appraisal process.

3 Strategic Case

3.1 Overview

- 3.1.1 The Strategic Case considers the need for change and this section of the report presents the context in terms of legislation, policy and guidance and previous development work which should be taken into account when considering the problems, objectives and possible solutions for the Scheme.
- 3.1.2 Chapter 2 of the WelTAG Stage 3 Impact Assessment Report (IAR) sets out in detail the relevant legislation, policy and guidance context for the Scheme and its wider strategic framework of A40 improvements.
- 3.1.3 The need for change is derived from a strategic priority for improved transport connections in West Wales to support economic prosperity, and contribute to the economic, social, cultural and environmental well-being of current and future generations.
- 3.1.4 The A40 in West Wales forms the lowest standard section of the Trans-European Road Network in the UK and the Trunk Road Forward Programme since 2002 has identified the strategic need for improvements to the A40 corridor, West of St Clears.
- 3.1.5 Development work has identified the need for improvements along that section of the A40, including localised improvements between Penblewin and Redstone Cross.
- 3.1.6 As such, the need for change is presented at three levels:
- a) Strategic (West Wales and beyond);
 - b) Corridor (A40 West of St Clears); and
 - c) Local Scheme (A40 Penblewin to Redstone Cross).

3.2 Strategic Need

- 3.2.1 The A40 trunk road forms part of the Trans-European Network-Transport (TEN-T) in West Wales and is a strategically important link between the national motorway network and the West Wales ports including Milford Haven, Fishguard and Pembroke Dock.

- 3.2.2 In particular, the A40 trunk road is a strategic link to Pembrokeshire, well-known as a tourist destination, with coast and countryside providing opportunities for a thriving tourism industry and a rich environment for food producers. Furthermore, the Haven Waterway Enterprise Zone in Pembrokeshire is based uniquely on existing and potential new energy sites, building on the area's established industry base.
- 3.2.3 Around 20% of the UK's energy supplies are received via Pembrokeshire, and the Zone remains an attractive location for energy companies with its excellent access to energy infrastructure, established supply chain and distribution infrastructure, skilled workforce and network of universities with expertise in a range of energy-related fields.
- 3.2.4 The Zone is also gaining a marine energy focus, given its deep-sea port facilities combined with marine conditions suited to wave and tidal stream technologies, plus the benefit of electricity grid access. A new wave energy demonstration zone has been established 13km (8 miles) off the Pembrokeshire coast. The Zone, managed by Wave Hub Limited working in partnership with Marine Energy Pembrokeshire and Pembroke Port, has the potential to support the demonstration of wave arrays with a generating capacity of up to 30MW for each project. Today, however, diversity and innovation characterise the range of local businesses and the Zone is particularly keen to support companies in other sectors to locate or expand here, too.
- 3.2.5 Alongside new and established energy, food and tourism businesses and their extensive supply chains, life sciences, ICT and manufacturing firms are being targeted in Haven Waterway Enterprise Zone. These require good access and connections to the transport network to assist the movement of labour and goods accordingly.
- 3.2.6 Hywel Dda University Health Board is also consulting upon its future plans, which include a major new urgent and planned care hospital centrally located somewhere between Narberth and St Clears, with all planned and specialist care centralised on a single site. The A40 is a key transport connection that will be important for connecting people, workers and emergency services to that facility.

3.2.7 The strategic need for improvements to the A40 in West Wales have been made clear in national policy documents since 2002 and has received continued ministerial support ever since.

3.2.8 In July 2013, Edwina Hart, the then Minister for Economy, Science and Transport, published a written statement outlining her priorities for Transport. This statement included:

“Improving the A40 has been identified as a priority by the Haven Waterway Enterprise Zone Board and I intend to undertake further development of previously proposed improvements.”

3.2.9 The issue of the A40 was further expressed in November 2014 following the announcement of the closure of the Milford Haven Refinery. Reflecting on this announcement, the then Minister made the following oral Statement in Plenary:

“In terms of transport links... I have asked my officials to conduct further urgent work to explore additional ways to improve the A40, including the potential for dualling.”

3.2.10 The A40 St Clears to Haverfordwest Study was commissioned in 2015 to re-evaluate previous development work and re-consider the strategic issues in the region, which any improvements to the A40 should help address or achieve. An Economic Activity & Location Impacts (EALI) Study as part of the 2015 work found:

- a) The South West Wales region has lagged behind the other areas in Wales in terms of productivity;
- b) The County was disproportionately impacted by the recession and is lagging behind the rest of Wales in terms of its recovery;
- c) Unemployment is highest in the main industrial areas of Milford Haven and Pembroke Dock;
- d) The south-east and south-west of the County, particularly industrial Pembroke Dock and Milford Haven have the lowest levels of attainment reflecting the wider socio-economic profiles of these areas;
- e) The absence of higher education establishments in Pembrokeshire means that prospective students have to leave the County to study; and

- g) Pembrokeshire is perhaps not receiving an equitable share of foreign direct investment projects and this may, in part be due to perceptions of, or the reality of, its peripheral location which are exacerbated by the current standard of the A40.

3.2.11 The 2015 EALI study also explained how a business survey in 2015 suggested:

- a) Enhanced transport connectivity to employment opportunities within the Swansea Bay City Region could reduce the insularity of the Pembrokeshire travel-to-work market, and if the actual or perceived change was such that it created a demand for in-migration to the area (or increased population retention), it is possible that this could enhance the commercial viability of land;
- b) The A40 is seen to be the main route for the agriculture sector and it is acknowledged that this does present some specific problems in terms of tractors moving between fields, tractors towing trailers and the movement of agricultural produce and livestock in standard commercial vehicles. There are numerous farms where the same farmer owns land north & south of the A40, which means that farmers need to use the road when travelling between their different holdings. Whilst they are believed to try and make such movements at off-peak times, this is not always possible, particularly at harvest leading to traffic disruption;
- c) There is evidence to suggest that the travel time to Pembrokeshire and the perception that the area is remote is acting as a barrier to growing the tourism market, and hence the contribution of the area towards the Welsh Tourism Strategy 2013-20. There was a strong view amongst a number of consultees that an improvement would help to tackle the perception that Pembrokeshire is 'far away' by connecting it to the dual carriageway network, thus attracting more visitors;
- d) The top three issues experienced by businesses that responded to a business survey were 'Poor journey time reliability – summer only' (42 high / medium adverse impact responses), 'Vehicle platooning & lack of overtaking opportunities' (41 high / medium adverse impact responses) and 'Other congestion on the A40 in West Wales' (38 high / medium adverse impact responses); and
- e) Businesses believed that an upgrade of the A40 between St Clears and Haverfordwest would have a high positive impact especially on customer / visitor numbers, marketing & promotion of their business and future investment plans in Pembrokeshire.

Impact of doing nothing

- 3.2.12 The impact of no intervention would mean that the existing problems along the A40, at a strategic scale, would continue and likely worsen with the increasing traffic levels. Issues such as vehicle platooning would continue owing to the lack of overtaking opportunities, impacting on strategic connections along the TEN-T network to the ports, to key tourist destinations, and strategic employment sites such as the Haven Waterway Enterprise Zone. It is likely that poor journey time reliability, particularly in the summer, would continue to have an adverse impact on the economy. The travel time to Pembrokeshire and the perception of the area's remoteness would continue to act as a barrier to growing the tourism market.
- 3.2.13 A do-nothing approach would be contrary to national policy documents, clearly citing the need for improvements along the A40 over several decades.

3.3 A40 west of St Clears

- 3.3.1 The A40 corridor west of St Clears provides a key road link between South East Wales and Haverfordwest, which is a gateway town as well as the focus of the tourist economy for central and north Pembrokeshire.
- 3.3.2 The St Clears to Haverfordwest section of the A40 has developed to connect small villages and as such many sections of the A40 pass through these communities, leading to issues around severance, air and noise concerns and safety problems.
- 3.3.3 The A40 accommodates a mix of traffic types, with seasonal variations. In the winter months the road carries local residents (typically car-based traffic); commercial vehicles, particularly around ferry arrival and departure times; and agricultural vehicles. In the summer months, the mix is supplemented by a higher volume of tourist traffic (increasing in some areas by over 40%) including cars and caravans.
- 3.3.4 The Welsh Government has considered improvements to the A40 between St Clears and Haverfordwest to address the identified transport and corridor related problems as well as the wider strategic drivers for improvements to access and connectivity within Pembrokeshire and beyond. In March 2002, the Trunk Road Forward Programme (TRFP) was published and included the A40 West of St Clears, stating:

'Improvement of the A40 trunk road, whether it be to single or dual carriageway standard, is beneficial in economic terms. Improvement to the road would not affect the number of people travelling on public transport significantly...

The A40 in West Wales forms the lowest standard section of the Trans-European Road Network (TEN-T) in the United Kingdom and there are major problems associated with upgrading the freight carrying capacity of rail in this area which means that significant improvement in the foreseeable future is not viable...

We are therefore satisfied that improvement to the A40 between St Clears and Haverfordwest is needed and that economic benefits will accrue. Upgrading the road to dual carriageway standard is likely to be justified but before a decision is finally made, we need more information on the environmental implications associated with alternative standards.'

3.3.5 The 2002 Trunk Road Forward Program (TRFP) was updated with a 2004 Addendum and 2008 Reprioritisation, where two required projects were announced:

- a) A40 Penblewin – Slebech Park improvement (completed in March 2011); and
- b) A40 Llanddewi Velfrey to Penblewin improvement (public enquiry held in March 2020).

Impact of doing nothing

3.3.6 The impact of no intervention would mean that with increasing traffic levels, the existing situation would worsen to the west of St Clears. Problems with safety, severance, air and noise would continue to impact on local communities, commuters, freight and tourists, with the problems exacerbated during the summer months with the additional tourist traffic.

3.3.7 The need for improvements to the west of St Clears has been noted since the 1990s. A do-nothing approach would see the A40 in West Wales continue to form the lowest standard section of the TEN-T in the UK. It would also not respond to the clear need for improvements noted within the Trunk Road Forward Programme and would not provide the infrastructure required to deliver the associated economic benefits.

3.4 A40 Penblewin to Redstone Cross Scheme

- 3.4.1 The local Scheme aims to provide improvements to the section of the A40 between Penblewin and Redstone Cross within the context of wider transport interventions on the A40 corridor west of St Clears.
- 3.4.2 As part of the A40 Llanddewi Velfrey to Penblewin Improvements study, a public information exhibition held in 2018 alongside a stakeholder engagement exercise, asked attendees their thoughts on the need or potential to extend the proposed improvements planned for Llanddewi Velfrey to Penblewin to further include the section to Redstone Cross. 51 responses submitted via completed comment forms supported such a need whilst only four comments expressed some reservations / concerns about the proposal to be included as part of the Scheme.
- 3.4.3 In August 2018 the Cabinet Secretary for Economy and Transport, Ken Skates AM, confirmed in writing to the H M Senior Coroner in response to the inquest into the death of a driver joining the A40 at Redstone Cross, that:
- “I acknowledge the very sad circumstances surrounding the death...and accept that in your opinion there is a risk of future deaths at this location unless appropriate action is taken... Preliminary investigations have begun to develop further overtaking opportunities & safety improvements along the length of the A40. This includes improvements at Redstone Cross. These additional A40 improvements are included in the update of the National Transport Finance Plan (NTFP) (Page 17 ref ‘NEW2’).”*
- 3.4.4 Further to this, Arup (supported by RML) were instructed by the Welsh Government in January 2019 to develop a solution to address the transport related problems along the A40 between Penblewin Roundabout and Redstone Cross.

3.4.5 The strategic rationale for the Scheme is (as set out in the National Transport Finance Plan 2015⁵) that it would help address road safety issues and improve accessibility to the Haven Waterway Enterprise Zone⁶ and employment sites on a TEN-T route. Welsh Ministers have confirmed that the improvements to the A40 are of importance, also clarifying that the scheme is a priority for the Haven Waterway Enterprise Zone Board.

3.4.6 The problems and objectives are compatible with those from the A40 Llanddewi Velfrey to Penblewin Improvements and the strategic rationale for the Scheme is therefore intrinsically linked to wider plans to improve the A40 corridor west of St Clears. The concern for safety between Penblewin and Redstone Cross is particularly of significance for this Scheme, with particular concern for safety at Redstone Cross junction. Further information on this is provided below in the following paragraph, with additional information provided in the IAR Sections 3.2.64 to 3.2.73.

3.4.7 Through analysis and identification for the need of the Scheme it has been shown that this section of the A40 generally has a 30% lower than average accident rate for this type of road. However, Table 2 shows that a high proportion of accidents result in fatal and serious injuries on this stretch of A40. A comparison against the default severity split given in WebTAG demonstrates that the severity of accidents on this section of the A40 is particularly skewed towards fatalities, with the likelihood of a fatality around 8 times higher than observations on roads of similar standard throughout Great Britain.

Table 2 Accident Severity Split

Severity Split	Fatal	Serious	Slight
Number of accidents (2008-2018)	2	2	5
Observed	22.22%	22.22%	55.56%
COBA-LT default, Older S2 A roads, >40mph	2.80%	15.30%	81.90%

3.4.8 The Welsh Government are considering the opportunity to deliver both the A40 Llanddewi Velfrey to Penblewin and A40 Penblewin to Redstone Cross Improvements as one Scheme.

⁵ <http://gov.wales/topics/transport/planning-strategies/ntp/?lang=en>

⁶ <https://businesswales.gov.wales/enterprisezones/zones/haven-waterway>

Impact of doing nothing

- 3.4.9 The impact of no intervention would mean that the existing problems would continue between Penblewin and Redstone Cross; poor journey quality during periods of traffic and platooning would continue to have adverse impacts on driver stress; and north-west connectivity and connectivity onto the A40 at Redstone Cross would continue to face severance issues. With increasing traffic flows, the existing problems are likely to worsen.
- 3.4.10 A do-nothing approach would also mean that there is a risk of further serious and fatal accidents at Redstone Cross and the junction's substandard nature and visibility problems would continue to be of safety concern to various transport users.

3.5 Summary of Key Issues

- 3.5.1 In summary, the key issues that drive the need for change on the A40 and in particular the section between Penblewin and Redstone Cross comprise a range of actual and perceived problems, which include both transport and wider economic issues:
- a) Limited and inconsistent overtaking opportunities, which leads to journey time unreliability, driver frustration and associated risky manoeuvres with severe collision incidents;
 - b) Platooning when there are convoys of heavy goods vehicles from the ferry ports and slow-moving agricultural vehicles accessing the many side roads and farm accesses along the A40 contribute to journey time unreliability when combined with the limited overtaking opportunities and mix of local and HGV traffic;
 - c) Slow moving traffic during the summer months exacerbates the problems with tourists causing a significant increase in traffic and slow-moving vehicles including caravans;
 - d) The region has lower than national average productivity levels and was disproportionately impacted by the recession in light of its reliance (compared to the national averages) on tourism, public administration, wholesale and retail (including agriculture), manufacturing and construction industries;
 - e) The absence of higher education establishments in Pembrokeshire means that prospective students have to leave the County to study; and

- f) Pembrokeshire is perceived to be remote and that this is deterring inward investment, tourism and the development of the travel-to-work market within the Swansea Bay City Region.

3.5.2 The associated evidence base for these issues is provided in full within the WelTAG Stage 3 IAR.

3.6 Engagement

Llanddewi Velfrey to Penblewin

Stage 1 Workshop

- 3.6.1 A separate WelTAG Stage 1, 2 and 3 has been undertaken for the A40 Llanddewi Velfrey to Penblewin Improvements, with the Stage 3 WelTAG being completed in April 2019. It is considered necessary to consider some of the engagement and decision making for the Llanddewi Velfrey to Penblewin Improvements, due to the interrelationship with the Penblewin to Redstone Cross Improvements.
- 3.6.2 As part of WelTAG Stage 1 of the Llanddewi Velfrey to Penblewin Improvements study, a workshop was held on 6 March 2017 to which all members of the review group were invited. The workshop discussed the revised WelTAG process and agreed how to proceed with the Stage 1 appraisal for the Scheme. As outlined in the first section of this report, WelTAG 2017 Stage 1 requires the identification of the problem(s), objectives and possible solutions for appraisal.
- 3.6.3 In order to inform discussions, a draft list of problems and objectives were presented. These were based on the outcomes of previous development work and the review of relevant legislation, policy and guidance.
- 3.6.4 The workshop attendees discussed and agreed a list of problems that the Scheme should aim to address, with consensus that the problems whilst taking into account previous development work still remained valid problems today, including additions.
- 3.6.5 The workshop attendees discussed and reviewed the initial list of objectives against the 2015 Act Well-being goals, and a revised list of objectives were agreed.

- 3.6.6 Following agreement on the problems and objectives, the workshop presented an indicative long list of options for the improvements which built on previous development work and included a combination of on-line and off-line options in addition to a number of non-road building options. Agreement was reached that the Stage 1 appraisal should consider a variety of options and not focus only on road building options.
- 3.6.7 The problems and objectives identified in this Penblewin to Redstone Cross WelTAG study share the same strategic principles as that of the A40 Llanddewi Velfrey to Penblewin Improvements. The local problems and objectives have been reviewed and refined to align with the Penblewin to Redstone Cross Improvements.

Penblewin to Redstone Cross

Review Group Stage 1 and 2 Workshop

- 3.6.8 A Review Group has been established at the project outset for the Penblewin to Redstone Cross WelTAG study in order to review WelTAG reports at each stage and record actions to be progressed.
- 3.6.9 An initial Review Group meeting was held in February 2019 to which all members of the review group were invited. The workshop discussed and agreed how to proceed with the Stage One and Two appraisal for the Scheme.
- 3.6.10 In order to inform discussions, a draft list of problems and objectives were presented. These were based on the outcomes of previous development work and the review of relevant legislation, policy and guidance. This included developing objectives in line with the Wellbeing of Future Generations Act 2015's Well-being goals.
- 3.6.11 The workshop attendees discussed and agreed an initial list of problems that the Scheme should aim to address, with consensus that the problems whilst taking into account previous development work still remained valid problems today, including alterations. These are presented in section 1.3 of this report.

- 3.6.12 Following agreement on the problems and objectives, the workshop presented an indicative long list of options for the improvements which built on previous development work and included a combination of online and offline options in addition to a number of non-road building options. Agreement was reached that the Stage One appraisal should consider a variety of options. These are presented in section 3.10 of this report.

Public Information Exhibitions, Consultation and Meeting

April 2019 Public Information Exhibition

- 3.6.13 95 people attended the first Public Information Exhibition (PIE) held in April 2019. The three options presented were:

- 1) Option 1A - Northern Route with staggered T-junction;
- 2) Option 1B - Northern Route with no Redstone Cross Junction;
- 3) Option 2A - Southern Route with staggered T-junction.

- 3.6.14 Key feedback received from the attendees included:

- a) 75% of respondents strongly supported the need for improvements between Penblewin Roundabout and through Redstone Cross;
- b) The majority of respondents (68%) agreed with the problems and objectives;
- c) Safety was a key concern at Redstone Cross;
- d) There was no clear preferred option by respondents. 17 respondents preferred Option 2, 15 respondents preferred Option 1B, 13 preferred Option 1A, 12 chose 'None of the options / other option' and 3 respondents left their response blank;
- e) Alternatives or enhancements included a roundabout, traffic calming measures, removal of the junction with the Southern Option and improvements to the existing junction layout.

May 2019 Public Information Exhibition

- 3.6.15 Following the feedback received at the first PIE, a further option was developed, and further public engagement was undertaken. 170 people attended the second PIE in May 2019 where four options were presented:

- 1) Option 1A - Northern Route with staggered T-junction
- 2) Option 1B - Northern Route with no Redstone Cross Junction
- 3) Option 2A - Southern Route with staggered T-junction
- 4) Option 2B – Southern Route with no Redstone Cross Junction

3.6.16 Key feedback received from the attendees included:

- a) 89% of respondents strongly supported the need for improvements between Penblewin Roundabout and through Redstone Cross);
- b) The majority (79%) of respondents agreed with the problems and objectives;
- c) Safety was a key concern at Redstone Cross;
- d) 72 respondents preferred Option 2B, 25 respondents preferred Option 1B, 15 respondents preferred Option 1A, 13 respondents preferred Option 2A, 3 respondents chose both Option 1A or 2A, 5 respondents chose both Option 1B or 2B, and 7 respondents chose No option or left the response blank;
- e) Alternatives or enhancements included alternative junction forms including a roundabout or slip road; speed limit and traffic calming measures; improvements to the current junction and existing A40; and consideration of public transport.

3.6.17 Further information, including drawings of the above options, is provided within the Consultation Document.

3.6.18 A public transport option had been considered as an alternative to road building, with a proposal to increase bus frequencies. However, this was discounted as the appraisal indicated that this would not address the problems or achieve the objectives.

3.6.19 As part of design development, WCHR options are being considered in line with the Active Travel (Wales) Act 2013, and will form part of the options under consideration, forming complementary measures to the road building solutions.

June 2019 Public Meeting

3.6.20 A public meeting was held on 20 June 2019, organised by some local residents to discuss the options presented at the Public Information Exhibitions. The meeting was held at the Bloomfield Community Centre and was attended by 35 members of the public, including several councillors. The following views were expressed and recorded by representatives of the project team:

- a) Improving the road will bring increased environmental impact;
- b) Narberth will see increased traffic which will cause it to be grid-locked;
- c) Redstone Road will become isolated;
- d) Increased use of A478 as a route into Narberth;
- e) There will be a detrimental impact on Blaenmarlais Care home;
- f) A poorly designed Scheme will have a big negative impact on Narberth, whereas a well-designed Scheme will keep it as it is;
- g) Noise during night of the convoy of 20 + ferry lorries;
- h) If the route is ever upgraded to a dual carriageway, then the impacts are only going to get worse; and
- i) Any proposal will prevent the 'Secret Owl Garden' from being relocated to Noble Court.

December 2019 Public Information Exhibition

3.6.21 In December 2019, a further public information exhibition was organised to present and discuss the preferred route with stakeholders. This exhibition was held at Llanddewi Velfrey Village Hall and 84 people attended this PIE.

3.6.22 Positive outcomes of the engagement include:

- a) Redstone Cross Overbridge: A overbridge to the existing Redstone Cross junction was created which provides north/south connectivity and access to the existing A40 carriageway;
- b) In response to feedback, a west facing access has been included at Redstone Cross;
- c) Active travel measures on the existing A40 are being considered in light of stakeholder feedback received.

July – September 2019 Public Consultation

3.6.23 In addition to the PIEs, a Public Consultation was held between 26 July 2019 and 20 September 2019 to seek views on the proposed improvements between Penblewin Roundabout and Redstone Cross on the A40, Pembrokeshire. The consultation provided the opportunity for views to be shared on:

- a) The initial identified preferred solution;
- b) Enhancements that could be made to the preferred solution; and
- c) Active travel measures that could be potentially incorporated.

3.6.24 Key feedback received from the consultees included:

- a) Many respondents offered their support for Option 2B (as also expressed during the two Public Information Exhibitions previously held). Many respondents generally supported the option however would like to see alterations, enhancements and/or additions to the existing proposal design. A number of respondents also expressed their opposition to the scheme.
- b) A key concern expressed was the impact that Option 2B would have on traffic in Narberth with a number of respondents stating that there are currently traffic problems at certain times through the town and this would be exacerbated through the removal of the connection to the A40 to the north of Redstone Road. There was particular concern relating to the problems that large vehicles would cause to traffic flows through Narberth. A couple of respondents noted that good signage could mitigate this issue by directing HGV drivers via the existing A40.
- c) Many respondents wanted the connection to the A40 (to the north of Redstone Road) to be maintained in some form including: by way of a western slip road, roundabout or staggered junction. This would enable connectivity to the trunk road to be maintained and would avoid causing traffic problems through Narberth and avoid creating longer routes for some journeys. Removing the junction was also viewed by some to potentially cause adverse impacts on local businesses. Many respondents on the other hand expressed their support for the removal of the Redstone Cross junction.
- d) Concerns for the impact on residential property and the care home were expressed. These concerns were for: the impact on property value, amenity, noise, pollution and views. The impact on the environment was also cited as a general concern by a few respondents including concerns for increased carbon emissions due to longer journeys.

- e) A few respondents stated that there should be more focus on responding to Narberth's traffic problems and improving the transport network
- f) There was overall support for active travel improvements for WCHR. Suggestions included: incorporating active travel provision along the existing A40, providing more WCHR routes, ensuring that the proposed bridge is wide enough to sufficiently accommodate all active travel users; reduce speed limits on the existing A40 and through Narberth, provide improvements aimed at those with mobility impairments. Other planned active travel improvements in the area were mentioned and would serve as an opportunity to join up proposals.
- g) One respondent expressed that the results of traffic surveys should be published and that the public should be engaged following this and prior to the selection of a preferred option.
- h) Most respondents felt that there would be no or limited impact on the Welsh language through the scheme or felt that they did not see a link between the scheme and the Welsh language. Some respondents noted that the scheme would improve north-south connectivity between the A40, connecting Welsh and English-speaking communities
- i) A variety of comments were received in relation to signage and the Welsh language including suggestions that signage should have Welsh language in one colour and English in another as currently, there is sometimes not enough time to read the signage.

Stage 3 Review Group Meeting

- 3.6.25 A WelTAG Stage Three Review Group meeting was held on Wednesday 24 June 2020 with representatives from Welsh Government, Arcadis, Mott MacDonald and members of the project team (Arup and RML Consulting). The meeting was held virtually via Microsoft Teams due to the Covid-19 pandemic and comprised of a presentation of the WelTAG Stage Three study followed by a feedback session.

- 3.6.26 The draft WelTAG Stage 3 Stage Report and Impact Assessment Report were shared with members of the Review Group two weeks prior to the session to provide time for a thorough review of the study reporting. The Review Group was held at the end of the Stage Three study and the findings and recommendations of the study were agreed by the Review Group as part of this meeting. Key feedback and discussion points have been summarised as follows and have since been actioned where required.
- 3.6.27 Further detail could be provided in relation to the Scheme's active travel proposals. The Review Group considered how the Scheme would provide substantial active travel improvements along the proposed detrunked section of the existing A40 and that this should be underlined within the report, particularly in relation to alignment with the Active Travel (Wales) Act 2013.
- 3.6.28 Discussion took place in relation to the Narberth Sustainable Transport Study and the potential opportunities for interrelationships between the A40 Penblewin to Redstone Cross Improvements scheme and this study.
- 3.6.29 In relation to impacts of the scheme upon traffic flows in Narberth, it was discussed that assessment work carried out had shown that there would be no significant adverse impact through Narberth as a result of the Scheme.
- 3.6.30 PCC raised outlined the potential for the plans for a new hospital that could be located on the A40 corridor.
- 3.6.31 Discussion took place in relation to future engagement during the Covid-19 pandemic. It was considered that public engagement on the draft Orders would be likely held virtually and that 'digital deprivation' should be avoided as much as possible by making efforts to engage with members of the community of whom are not 'digitally connected'.

3.7 Problems

- 3.7.1 Evidence and analysis to support the identification of the problems is provided in Section 3 of the IAR, and includes data and information on the following:

- a) Journey Times / Reliability Data (road, public transport and port);
- b) Traffic Flows;
- c) Traffic Forecasts;
- d) Road Safety;
- e) Speed Profile;
- f) Social and Cultural Information;
- g) Economic Activity Data;
- h) Travel to Work Data; and
- i) Environmental context.

3.7.2 It should be noted that these topics involve both actual (quantified or verified) data, as well as perceived (qualitative or unverified) data. Both form evidence for considering and identifying the problems.

3.7.3 As outlined above, the need for change along this section of the A40 has emerged through a large amount of previous development work, which has helped identify the problems on the corridor and identify a range of potential options that could help address the problems.

3.7.4 The 2015 A40 St Clears to Haverfordwest Study EALI Study explained that whilst the A40 corridor may be seen as an important local issue, it is unlikely that a conventional Transport Economic Efficiency (TEE) analysis would generate a positive Net Present Value (NPV) and Benefit-Cost Ratio (BCR) for a Scheme of this nature given the relatively low traffic volumes. The report clarified that EALI Guidance states that:

“It is important to recognise that perceptions of problems with the transport system by users, operators, the public at large and politicians can be equally as important as problems that can be quantified through analysis of data”.

3.7.5 That work has informed policy development and iterations of decision making by Welsh Ministers which has led to the progression of the A40 Penblewin to Redstone Cross project.

3.7.6 At this latest stage of appraisal, an up to date review of the context and baseline information was taken into account (as presented in Section 2 and 3 of the IAR), which has helped refresh the understanding of the problems that any transport intervention should aim to address.

3.7.7 The problems identified were discussed and agreed by the Review Group and are set out within Table 3. Table 3 also provides a summary of the supporting evidence.

Table 3 Problems

No.	Problem	Evidence
P1	The A40 Redstone Cross Junction is below modern design standards. Poor visibility and substandard junction layout can lead to severe road accidents.	<p><i>Corridor and Scheme Level</i></p> <p>The A40 within the study area is below modern design standards. It forms part of the A40 West of St Clears which is the lowest standard section of the TEN-T in the UK.</p> <p>Pavements within this section also fall below modern carriageway standards in terms of widths.</p> <p>Existing provision along the A40 between St Clears and Haverfordwest gives a total of 5.5km overtaking lanes in the westbound direction and 3.2km in the eastbound, amounting to some 13% of the total 32.5km length. This is well below the 30% ratio advised for this type of route.</p> <p>For vehicles travelling eastbound, there are constraints to overtaking for at least 19km from Robeston Wathen towards St Clears roundabout and for vehicles travelling westbound for 9.5km from Canaston Bridge to Haverfordwest roundabout.</p> <p>Section 3.2.32 – 3.2.73 of the IAR indicates how the lack of safe overtaking opportunities and substandard design has contributed to fatalities and serious accidents occurring. Of the accidents that have occurred (9 in total between 2008 - 2018), 44% are either fatal or serious.</p> <p>Further evidence is provided within the Initial Traffic and Accident Data Report for the Scheme.</p>

No.	Problem	Evidence
P2	Limited overtaking opportunities lead to poor journey time reliability and driver frustration.	<p><i>Corridor and Scheme Level</i></p> <p>The A40 currently offers limited areas which allow safe unambiguous overtaking opportunities. There is inconsistency in the level of overtaking provision between the eastbound and westbound directions.</p> <p>Journey time reliability is a problem when drivers get stuck behind a slow-moving vehicle and cannot overtake. As explained in the IAR section 3.2, the types of accidents occurring demonstrate the risks drivers take because they are frustrated by lack of overtaking opportunities. Accident analysis shows that 2+1 roads offering overtaking opportunities are safer than single carriageway roads.</p> <p>The 2015 EALI study and associated business survey (described in section 3.2.11) confirmed that there is a perception that the employment areas in the region are considered to be remote as a result of the low standard of accessibility by road, including the lack of safe overtaking opportunities, which causes delays when there are slow moving vehicles, creating increased journey times.</p>
P3	Occasional convoys of heavy goods vehicles from the ferry ports and slow-moving agricultural vehicles contribute to period of platooning and journey time unreliability, which is exacerbated with limited overtaking opportunities.	<p><i>Corridor Level</i></p> <p>Traffic data (see section 3.2 of the IAR) shows a small peak in traffic in the eastbound direction which links in with the arrival of ferry traffic.</p> <p>Speeds along the A40 vary when activity at the Port is high, with industrial and commercial vehicles, as well as tourists using the A40 as a strategic link.</p> <p>Platooning, exacerbated by the mix of traffic including large agricultural vehicles, causes delays.</p> <p>Journey time unreliability is worst on Friday PM peaks, caused by long distance commuters returning home to the County and weekend visitors arriving (see section 3.3.10 of the IAR).</p>

No.	Problem	Evidence
P4	Seasonal spikes in traffic volumes along the A40 especially during the summer months leads to slow moving traffic causing journey time unreliability, which is exacerbated with limited overtaking opportunities.	<p><i>Corridor Level</i></p> <p>Journey speeds and unreliability of journey times are a greater problem in summer months when there is an increase in traffic levels caused by tourists.</p> <p>For example, traffic data (see section 3.2 of the IAR) shows traffic volumes in August are over 50% higher than those observed in January.</p> <p>This increase in traffic volumes and associated increase in slow moving vehicles such as caravans is known to exacerbate the journey time unreliability and safe overtaking problems on the A40.</p>
P6	There are many side road junctions and direct accesses to properties and agricultural fields off the A40, which contributed to operational problems along the road.	<p><i>Corridor and Scheme Level</i></p> <p>Paragraph 3.2.62-3.271 of the IAR relates to road safety and indicates that accidents tend to occur as a result of interference at junctions and are generally severe in nature.</p>
P7	A mix of traffic types using the road, contributing to journey time unreliability and driver frustration, risky manoeuvres and collision incidents.	<p><i>Corridor Level</i></p> <p>Data in section 3.2 of the IAR shows a traffic make-up of 74% cars, 18% LGV and 8% HGV. The A40 is also used by slower moving agricultural vehicles as well as seasonal tourist traffic (including caravans). This make up contributes to problems associated with platooning and overtaking.</p> <p>Further information is available in the Initial Traffic and Accident Data Report.</p>
P8	A lack of strategic public transport connectivity in Pembrokeshire generally means there is a dependence on the private car for inter-urban connections.	<p><i>Corridor Level</i></p> <p>Data in section 3.3 of the IAR shows higher than average car ownership and lower than average numbers of households without access to a car. Public transport data presented in IAR section 3.2 illustrates that services in the study area are generally infrequent and operate fairly short hours of service. This combined with non-competitive journey times when compared car-based journeys makes public transport an unattractive journey choice.</p>

3.8 Objectives

3.8.1 The objectives for the Scheme were developed in order to help appraise possible options.

3.8.2 The Scheme objectives as agreed by the Review Group are:

O1 To enhance network resilience and improve accessibility along the east-west transport corridor to key employment, community and tourism destinations.

O2 To improve prosperity and provide better access to the county town of Haverfordwest, the Haven Enterprise Zone and the West Wales ports at Fishguard, Milford Haven and Pembroke Dock.

O3 To reduce community severance and provide health and amenity benefits.

O4 To improve the Redstone Cross Junction safety (including perceived safety) and reduce the number and severity of collisions.

O5 To promote active travel by cycling, horse riding and walking to provide opportunities for healthy lifestyles.

O6 To deliver a Scheme that promotes social inclusion and integrates with the local transport network to better connect local communities to key transport hubs.

O7 Deliver a project that is sustainable in a globally responsible Wales, taking steps to reduce or offset waste and carbon.

O8 Give due consideration to the impact of transport on the environment and provide enhancement when practicable.

3.8.3 The objectives have taken account of particular drivers, issues and opportunities identified through the baseline review of relevant legislation, policy, guidance and the social / cultural, environmental and economic position within the study area and wider region.

- 3.8.4 The objectives therefore respond to the identified problems, aiming to help address them, as well as respond to the strategic issues identified in national and local policy and programmes e.g. the need to improve connectivity to the Enterprise Zone and City Region.
- 3.8.5 In developing the objectives, a review was undertaken against the well-being goals as presented within the Well-being of Future Generations (Wales) Act 2015.
- 3.8.6 This helps ensure that the Scheme objectives align to the wider sustainable development principle of the Welsh Government and take into account the needs of future generations.
- 3.8.7 As aforementioned, each objective aims to address one or more of the identified problems.
- 3.8.8 Therefore, if a transport intervention is appraised to perform positively in addressing the objectives it is given that it would overcome the problems identified.
- 3.8.9 In addition, an option that performs well against the objectives would be expected to align to the Well-being of Future Generations Act well-being goals.
- 3.8.10 The Well-being Goals (WFGA 1-7) are listed within Table 4 and the problems (1-8) are included within section 1.3. These are considered to align to the objectives for the Scheme and problems identified, as shown in Table 5. Given the interlinkages between the problems and objectives in the way that the objectives aim to address the problems, whilst contributing to the Well-being goals, Table 5 provides a detailed summary of the alignment of the Scheme objectives and identified problems with the Well-being Goals.

Table 4 Well-being Goals

WFGA 1	A prosperous Wales	WFGA 5	A Wales of cohesive communities
WFGA 2	A resilient Wales	WFGA 6	A Wales of vibrant culture and thriving Welsh Language
WFGA 3	A healthier Wales	WFGA 7	A globally responsible Wales
WFGA 4	A more equal Wales		

Table 5 Alignment of Scheme Objectives and corresponding Problems with the Well-being Goals

Objective and corresponding problems	Well-being Goals
<p>Objective 1: To enhance network resilience and improve accessibility along the east-west transport corridor to key employment, community and tourism destinations.</p> <p>Problems: 1, 2, 3, 4, 5, 6, 7</p>	<p>1: A prosperous Wales</p> <p>The objective seeks to improve connectivity along the east-west transport corridor. In achieving this objective, this would provide benefits to the economy by improving access to key employment, community and tourism sites. By improving accessibility, West Wales would become more attractive as a place to invest in, including providing potential additional employment opportunities, and attract people to live and work in the area.</p>
	<p>2: A resilient Wales</p> <p>The objective does not relate directly to the well-being goal however the aim of the Scheme is to give due consideration to the impact of transport on the environment and therefore aims to contribute to a resilient Wales.</p>
	<p>3: A healthier Wales</p> <p>The Scheme aims to improve safety of which relates to having good accessibility. The Scheme would improve the safety of movement by improving the standard of the highway network and providing opportunities for overtaking, thus reducing the likelihood of a collision occurring. Moreover, the Scheme would improve connections to essential services such as to a hospital, GP surgery or dentist.</p>
	<p>4: A more equal Wales</p> <p>Through improving connectivity within West Wales and improving the perception of the area in terms of its accessibility, the Scheme would contribute to improving the economy of a relatively deprived area in comparison to other areas across Wales.</p>
	<p>5: A Wales of cohesive communities</p> <p>Improving accessibility along the east-west corridor would enable communities to become more connected. The Scheme would also improve safety for communities by improving the safety of the highway network and also by providing improvements to active travel connectivity.</p>
	<p>6: A Wales of vibrant culture and thriving Welsh Language</p> <p>The Scheme would contribute positively to this objective by providing enhanced connectivity to cultural facilities, this includes improving accessibility to the region for tourists; therefore, helping to maintain a thriving culture in West Wales.</p>

Objective and corresponding problems	Well-being Goals
	<p>The Scheme would also improve connections to Welsh Language institutions such as to Welsh Language schools.</p> <p>7: A globally responsible Wales</p> <p>The aim of the Scheme is to give due consideration to the impact of transport on the environment and therefore aims to contribute to a globally responsible Wales. The A40 forms part of the TEN-T network of which provides an important link for international connectivity via the ports. The Scheme objective does not specifically relate to this Well-being goal.</p>
<p>Objective 2: To improve prosperity and provide better access to the county town of Haverfordwest, the Haven Enterprise Zone and the West Wales ports at Fishguard, Milford Haven and Pembroke Dock.</p> <p>Problems: 1, 2, 3, 4, 5, 6, 7</p>	<p>1: A prosperous Wales</p> <p>The Scheme would contribute to improving prosperity and providing better accessibility to key areas by enhancing connectivity and resilience to key employment and tourism destinations. Improved overtaking opportunities and thus more reliable journey times would contribute to helping improve the perception of Pembrokeshire for both businesses and tourists.</p> <p>2: A resilient Wales</p> <p>A resilient Wales is about maintaining and enhancing a biodiverse natural environment with healthy functioning ecosystems of which support economic resilience in conjunction with social and economic resilience. The Scheme aims to improve prosperity and also to give due consideration to the impact of transport on the environment, therefore the Scheme aims to contribute to a resilient Wales.</p> <p>3: A healthier Wales</p> <p>A key driver of the Scheme relates to safety and accessibility. The Scheme aims to provide better access to key locations; a key consideration of accessibility is being able to safely travel. By addressing the existing safety concerns at Redstone Cross junction and by improving overtaking opportunities and therefore reducing the likelihood of risky manoeuvres being made, the Scheme would positively contribute to a healthier Wales. The Scheme also provides the opportunity for benefits to be experienced for WCHR.</p> <p>4: A more equal Wales</p> <p>Through improving connectivity within West Wales and improving the perception of the area in terms of its accessibility, the Scheme would contribute to improving the economy of a relatively deprived area in comparison to other areas across Wales.</p>

Objective and corresponding problems	Well-being Goals
	<p>5: A Wales of cohesive communities</p> <p>Providing better access to key locations would enable communities to become more connected. The Scheme would also improve safety for communities by improving the safety of the highway network and also by providing improvements to active travel connectivity.</p>
	<p>6: A Wales of vibrant culture and thriving Welsh language</p> <p>The Scheme would contribute positively to this objective by providing enhanced connectivity to cultural facilities, this includes improving accessibility to the region for tourists; therefore, helping to maintain a thriving culture in West Wales. The Scheme would also improve connections to Welsh Language institutions such as to Welsh Language schools.</p>
	<p>7: A globally responsible Wales</p> <p>The aim of the Scheme is to give due consideration to the impact of transport on the environment and therefore aims to contribute to a globally responsible Wales. The A40 forms part of the TEN-T network of which provides an important link for international connectivity via the ports. The Scheme objective does not specifically relate to this Well-being goal.</p>
<p>Objective 3: To reduce community severance and provide health and amenity benefits</p> <p>Problems: 1, 2, 3, 4, 6</p>	<p>1: A prosperous Wales</p> <p>Improvements to the safety of the highway network would lead to the provision of health benefits with a reduced likelihood of collisions occurring and less driver frustration experienced. The Scheme's contribution to affecting safety and journey time reliability will improve access to key economic sites such as strategic employment sites and tourism destinations, thus contributing to a prosperous Wales.</p> <p>2: A resilient Wales</p> <p>This objective demonstrates the Scheme's commitment to providing health and amenity benefits. Active travel enhancements to the local area will provide the opportunity for more active travel journeys to be made locally; WCHR would have a better impact on the environment compared to travelling by car for example. The Scheme will nonetheless largely provide benefits to those travelling by car.</p> <p>3: A healthier Wales</p> <p>This objective strongly relates to the Well-being goal as a key element of the Scheme is addressing a need to improve safety.</p>

Objective and corresponding problems	Well-being Goals
	By improving the standard of the highway network and addressing safety issues at Redstone Cross junction, the Scheme contributes to building a healthier Wales. Improvements to connectivity via WCHR will also contribute positively to a healthier Wales.
	4: A more equal Wales There is no direct link between the Scheme objective and this Well-being goal.
	5: A Wales of cohesive communities By improving safe connectivity to the A40 and thus reducing the severance issues currently experienced at Redstone Cross, the Scheme would enable improved connectivity for communities and provide improvements to active travel connectivity.
	6: A Wales of vibrant culture and thriving Welsh language There is no direct link between the Scheme objective and this Well-being goal.
	7: A globally responsible Wales There is no direct link between the Scheme objective and this Well-being goal.
Objective 4: To improve the Redstone Cross Junction safety (including perceived safety) and reduce the number and severity of collisions. Problems: 1, 2, 3, 4, 5, 6	1 A prosperous Wales By improving safety and reducing the number and severity of collisions, there will be beneficial impacts on productivity, on the emergency services and on journey time reliability, all benefits would contribute towards a prosperous Wales.
	2 A resilient Wales There is no direct link between the Scheme objective and this Well-being goal.
	3 A healthier Wales This Scheme objective strongly links with this Well-being goal as by improving safety and reducing the number and severity of collisions would have a positive impact on people's physical health. The improvements to safety would also provide benefits for the perception of safety, benefitting people's mental health due to reduced driver stress.
	4 A more equal Wales The severity of collisions at this location is proportionately worse than other, similar roads by comparison. Those using Redstone Cross are therefore putting their selves at risk more so in comparison to similar roads, thus by improving safety, the Scheme is contributing towards a more equal Wales.

Objective and corresponding problems	Well-being Goals
	<p>5 A Wales of cohesive communities</p> <p>By improving safety, the Scheme would enable improved connectivity for communities and provide improvements to active travel connectivity, contributing towards a Wales of cohesive communities.</p>
	<p>6 A Wales of vibrant culture and thriving Welsh language</p> <p>Through improvements to safety, accessibility is improved for journeys to cultural and Welsh language education facilities.</p>
	<p>7 A globally responsible Wales</p> <p>By improving safety along the A40 of which forms a part of the TEN-T network, accessibility will improve for all users including those travelling via the ports, thus enhancing international connectivity.</p>
<p>Objective 5: To promote active travel by cycling, horse riding and walking to provide opportunities for healthy lifestyles.</p> <p>No specific problems identified however the Scheme aims to improve active travel connectivity to provide enhancements to WCHR in the local community.</p>	<p>1 A prosperous Wales</p> <p>By improving active travel connectivity for residents and visitors to the area, enhanced and / or additional routes have the potential to increase active travel journeys, contributing to improvements to health and productivity, with a positive impact on health and care services in the long term.</p>
	<p>2 A resilient Wales</p> <p>Active travel improvements would provide enhanced opportunities for active travel journeys to be made. Journeys that were previously made by car and are now made by active travel would have a positive impact on the environment, contributing to a resilient Wales. The Scheme nonetheless has the potential to encourage more journeys by car on a strategic scale, thus negatively impacting on a resilient Wales. It is anticipated that in the long term, as vehicle technology improves, the environmental impact from cars will reduce.</p>
	<p>3 A healthier Wales</p> <p>This Scheme objective and Well-being goal strongly align with each other. The Scheme aims to provide enhancements to active travel connectivity of which will provide more opportunity for healthy lifestyles, thus contributing to a healthier Wales.</p>
	<p>4 A more equal Wales</p> <p>There is no direct link between the Scheme objective and this Well-being goal.</p>

Objective and corresponding problems	Well-being Goals
	<p>5 A Wales of cohesive communities</p> <p>Improvements to active travel through the Scheme would provide the opportunity for communities to feel more connected, and also provide improvements to safety for the local community.</p>
	<p>6 A Wales of vibrant culture and thriving Welsh language</p> <p>This Well-being goal aims at promoting and protecting culture such as encouraging people to participate in sports and recreation. By improving active travel connectivity, the Scheme contributes to this Well-being goal.</p>
	<p>7 A globally responsible Wales</p> <p>Active travel improvements would provide enhanced opportunities for active travel journeys to be made. Journeys that were previously made by car and are now made by active travel would have a positive impact on the environment, contributing to a globally responsible Wales. The Scheme nonetheless has the potential to encourage more journeys by car on a strategic scale, thus negatively impacting on a resilient Wales. It is anticipated that in the long term, as vehicle technology improves, the environmental impact from cars will reduce.</p>
<p>Objective 6: To deliver a Scheme that promotes social inclusion and integrates with the local transport network to better connect local communities to key transport hubs.</p> <p>Problems: 1, 2, 3, 4, 5, 6, 7</p>	<p>1 A prosperous Wales</p> <p>Although the Scheme itself is unlikely to encourage modal shift, it would provide slight benefits for journeys to key public transport hubs through improvements to journey time reliability along the A40 corridor. Improved connectivity would provide benefits for commuting along the corridor, benefitting social inclusion and contributing towards a prosperous Wales.</p>
	<p>2 A resilient Wales</p> <p>There is no direct link between the Scheme objective and this Well-being goal.</p>
	<p>3 A healthier Wales</p> <p>The Scheme aims to enhance opportunities for active travel and therefore promote social inclusion and integration with the local transport network, therefore contributing towards a healthier Wales.</p>
	<p>4 A more equal Wales</p> <p>The World Bank Group defines social inclusion as ‘the process of improving the terms for individuals and groups to take part in society, and the process of improving the ability, opportunity, and dignity of those disadvantaged on the basis of their identity to take part in society’⁷.</p>

⁷ The World Bank Group – Social Inclusion - <https://www.worldbank.org/en/topic/social-inclusion>

Objective and corresponding problems	Well-being Goals
	<p>The Scheme has aimed to encourage engagement with the local community and stakeholders throughout the study's development. The exhibitions and consultations have been held to include out-of-office hours for example, to maximise attendance and engagement. The Scheme's Public Liaison Officer is also available on a weekly basis to respond to queries in the local community.</p> <p>Moreover, the Scheme aims to improve active travel connections meaning that WCHR would experience benefits of the Scheme, promoting social inclusion.</p> <p>The Scheme's aim to improve safety would also contribute to a more equal Wales as the community is currently disadvantaged by the safety issues present at Redstone Cross.</p>
	<p>5 A Wales of cohesive communities</p> <p>The engagement undertaken, as outlined above, has enabled the public and stakeholders to put forward their opinions and ideas and thus has provided the community opportunities to consider how and if improvements to transport should be considered between Redstone Cross and Penblewin Roundabout.</p> <p>By addressing safety concerns and providing active travel improvements would also contribute positively to a Wales of 'attractive, viable, safe and well-connected communities.'</p>
	<p>6 A Wales of vibrant culture and thriving Welsh language</p> <p>By promoting social inclusion and accessibility, the Scheme contributed to improving access to cultural and Welsh language facilities. As noted previously, although the Scheme itself is unlikely to encourage modal shift, it would provide slight benefits for journeys to key public transport hubs through improvements to journey time reliability along the A40 corridor.</p>
	<p>7 A globally responsible Wales</p> <p>By improving active travel improvements, the Scheme aims to enable more journeys to be made on foot, by bicycle or by horse riding. It is nonetheless noted that the Scheme would promote social inclusion on a strategic scale by improvements to journey time reliability for motor vehicles.</p>
<p>Objective 7: Deliver a project that is sustainable in a globally responsible Wales, taking steps to reduce or offset waste and carbon.</p>	<p>1 A prosperous Wales</p> <p>By delivering a project that is sustainable, the Scheme would contribute to a prosperous Wales by ensuring that the environment's natural resources are protected or enhanced where practicable, contributing towards a prosperous Wales.</p>

Objective and corresponding problems	Well-being Goals
<p>No specific problems however the objective relates to the aim of the Scheme to deliver a sustainable improvement. The Scheme will take steps to reduce or offset waste and carbon where possible.</p>	<p>2 A resilient Wales</p> <p>This Scheme objective and this well-being goal strongly interconnect as delivering a project that is sustainable and takes steps to reduce or offset waste and carbon that will contribute positively to a resilient Wales; a nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems.</p>
	<p>3 A healthier Wales</p> <p>By aiming for a sustainable project in which reduces or offsets waste and carbon, the Scheme aims to reduce any potential adverse health impacts of the Scheme and providing enhancements for health where possible. Mitigation measures for the waste and carbon impact of the Scheme will be set out for the construction and operation phases.</p>
	<p>4 A more equal Wales</p> <p>There is no direct link between the Scheme objective and this Well-being goal.</p>
	<p>5 A Wales of cohesive communities</p> <p>There is no direct link between the Scheme objective and this Well-being goal.</p>
	<p>6 A Wales of vibrant culture and thriving Welsh language</p> <p>There is no direct link between the Scheme objective and this Well-being goal.</p>
	<p>7 A globally responsible Wales</p> <p>This Well-being goal is embedded within this Scheme objective. In line with the Future Generations (Wales) Act 2015, the Scheme aims to take account of whether the improvements that could be provided to the economic, social, environmental and cultural well-being of Wales, would also make a positive contribution to global well-being.</p>
<p>8: Give due consideration to the impact of transport on the environment and provide enhancement when practicable.</p> <p>No specific problems however the objective relates to the aim of the</p>	<p>1 A prosperous Wales</p> <p>This Scheme objective links with this well-being goal due to the importance of the environment for a strong economy. The environment provides resources to the economy, and so by reducing the environmental quality of a place, economic growth can be adversely affected by lowering the quantity and quality of resources, or due to health impacts⁸.</p>
	<p>2 A resilient Wales</p>

⁸ The Organisation for Economic Co-operation and Development (OECD) – Global Forum on Environment and Economic Growth - <https://www.oecd.org/economy/greeneco/global-forum-on-environment-2016.htm>

Objective and corresponding problems	Well-being Goals
Scheme to give due consideration to the impact of transport on the environment throughout option development.	This Scheme objective and this well-being goal strongly interconnect as mitigating environmental impacts and enhancing when practicable will contribute positively to a resilient Wales; a nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems.
	3 A healthier Wales The aim of the Scheme is to also improve the active travel network locally. The northern options would sever a Public Right of Way (PRoW) however it is considered that the associated impacts would be mitigated through diversions and reinstatements. Moreover, all proposed options would allow the existing A40, of which would no longer exist as a trunk road, to perform as a local access route and provide safer opportunities for active travel movements. Mitigation and enhancement measures for the impact on the environment e.g. biodiversity and the water environment would also be in place.
	4 A more equal Wales There is no direct link between the Scheme objective and this Well-being goal.
	5 A Wales of cohesive communities There is no direct link between the Scheme objective and this Well-being goal.
	6 A Wales of vibrant culture and thriving Welsh language There is no direct link between the Scheme objective and this Well-being goal.
	7 A globally responsible Wales The Scheme would inevitably have environmental impacts including on the landscape, biodiversity and soils. The aim of the Scheme nonetheless is to minimise environmental impact of the Scheme and provide enhancement where practicable.

3.8.11 The above table demonstrates the positive interrelationship between the problems, objectives and the well-being goals.

3.9 Options

Long List of Options

- 3.9.1 A great deal of development work has previously been undertaken and informed both the location of planned improvements and the preferred design of any highway improvements along the A40 between St Clears and Haverfordwest.
- 3.9.2 The WelTAG Stage 1 & 2 study reviewed in detail the previous development work and identified problems and objectives relating to the study context and explained the reasons for sifting a long list of options to a short list.

3.10 Shortlist of Options

- 3.10.1 The Stage 1 WelTAG builds on the previous development work and further appraises options that take into account the outcomes of the previous development and consultation work, in addition to a do minimum option and a public transport intervention.
- 3.10.2 The Review Group agreed that the options to be considered as part of the WelTAG Stage 1 appraisal were to include:

Do Minimum

- 3.10.3 Limited intervention reflecting the existing situation in the future, with the addition of any planned or committed measures as identified in the Pembrokeshire LDP.

Active Travel

- 3.10.4 Active travel options aimed at improving local connectivity including WCHR. Complementary active travel measures have been designed and incorporated into the Scheme in conjunction with a WCH Assessment and Review Report.

Public Transport

- 3.10.5 Increase frequency of bus services.

Highway Options – Southern Route

RSX1a

- 3.10.6 Offline straight alignment between Penblewin and Redstone Cross, with online ghost island junction improvement at Redstone Cross. Vertical tie-in west of Redstone Cross to improve geometry and visibility at the junction.

RSX1b

- 3.10.7 Offline straight alignment between Penblewin and Redstone Cross, with online ghost island junction improvement at Redstone Cross. Vertical tie-in east of Redstone Cross. No improvement to mainline vertical geometry through the junction.

RSX1c

- 3.10.8 Offline alignment minimising separation between proposed and existing A40. Online ghost island junction improvement at Redstone Cross. Vertical tie-in east of Redstone Cross Junction. No improvement to mainline vertical geometry through the junction.

RSX1d

- 3.10.9 Offline alignment between Penblewin and Redstone Cross south of existing alignment. Vertical tie-in west of Redstone Cross (approximately at access to Jacob's Park). Offline junction improvement south of existing Redstone Cross Junction.

RSX1e

- 3.10.10 Redstone Cross Junction Improvement works only. No improvements to A40 mainline west of the junction.

RSX1f

- 3.10.11 Offline alignment between Penblewin and Redstone Cross south of the existing alignment. Vertical tie-in west of Redstone Cross (approximately at access to Jacob's Park). No Junction provided for Redstone Cross. Side road diversions and underpass provided for north-south connectivity between Narberth & Bethesda.

RSX1g

- 3.10.12 Offline alignment between Penblewin and Redstone Cross south of the existing alignment. Vertical tie-in west of Redstone Cross (approximately at access to Jacob's Park). No junction provided for Redstone Cross. Overbridge provided for north-south connectivity between Narberth & Bethesda.

RSX1h

- 3.10.13 Offline alignment between Penblewin Roundabout and Redstone Cross south of the existing alignment. Offline roundabout constructed to the south of the existing Redstone Cross Junction.

Highways Options – Northern Route*RSX2a*

- 3.10.14 Single carriageway offline alignment to the north of existing Redstone Farm, with offline junction improvement north of Redstone Cross.

RSX2b

- 3.10.15 Offline alignment between Penblewin Roundabout and Redstone Cross north of the existing alignment. Vertical tie-in west of Redstone Cross (approximately at access to Jacob's Park). Overbridge provided along Bethesda Road to maintain north – south connectivity between Narberth – Bethesda. New side road provision connecting the A478 south of Penblewin with the existing A40.

RSX2c

- 3.10.16 Offline alignment between Penblewin Roundabout and Redstone Cross north of the existing alignment. Vertical tie-in west of Redstone Cross (approximately at access to Jacob's Park). Offline junction improvement north of existing Redstone Cross Junction.

RSX2d

- 3.10.17 Offline alignment (long option) between Penblewin Roundabout and Redstone Cross north of the existing alignment Vertical tie-in west of Jacob's Park. Overbridge spanning across the new alignment providing north – south connectivity between Narberth – Bethesda.

RSX2e

- 3.10.18 Offline alignment between Penblewin Roundabout and Redstone Cross to the north of the existing alignment. Vertical tie-in west of Redstone Cross (approximately at access to Jacob's Park). Offline roundabout to the north of existing Redstone Cross Junction.
- 3.10.19 Each of the options was subject to WelTAG Stage 1 appraisal, with a description of each option, how it would tackle the identified problems, how it would meet the objectives, as well as key risks, adverse impacts, constraints and dependencies.
- 3.10.20 A number of options were not recommended to be shortlisted for reasons such as not addressing highway safety concerns, impact on property, limitations for improvements to active travel, and not providing sufficient improvements to the standard of the A40.
- 3.10.21 The short-list firstly identified three options comprising active travel and variations of a highway route. Following further public and stakeholder engagement and technical work, a fourth option was developed. Stage 2 of the study involved the assessment of four different variations of a highway route with complementary active travel measure, compared to a do minimum scenario.
- 3.10.22 Active travel, supporting:
- a) Northern highway route – Option 1A.
 - b) Northern highway route – Option 1B.
 - c) Southern highway route – Option 2A.
 - d) Southern highway route – Option 2B.
- 3.10.23 The development of these options is explained in more detail in the Design Options Report.

- 3.10.24 Appraisal undertaken at Stage 2 made it clear that Option 2B, a southern route without a junction would best address the problems, best achieve the objectives and perform best against the majority of cultural, social and economic appraisal criteria, appreciating that there would be some adverse impacts in particular on the environment.
- 3.10.25 Stakeholders have also expressed strong support for Option 2B for safety and journey time reasons associated with local traffic joining the A40. After reviewing this and Stakeholder feedback, the project team has decided to take this option forward for Stage 3 appraisal with some modifications including the provision of a westbound junction from Redstone Cross.
- 3.10.26 This proposed junction has been included to improve the current staggered junction arrangement which is substandard and historically has contributed to collisions and continues to pose a risk to public safety. The new junction would be built to modern standards and would serve to improve visibility for motorists accessing the A40, it would also serve to ensure that the impact of the Scheme on Narberth is reduced responding to Stakeholder feedback on this issue as cited above.

3.11 Preferred Option

- 3.11.1 WelTAG Stage 3 now provides a full business case of the preferred option comprising:
- “A new 1.8km length of A40 trunk road with two lanes provided in one direction, to allow overtaking, and one lane provided in the opposite direction. The construction of a new westbound junction at Redstone Cross and improved active travel links along the existing A40 which would be de-trunked.”*
- 3.11.2 A General Arrangement drawing of the Scheme is shown contained in Appendix B with further detailed presented in Volume 3 Appendix 2.6 of the ES.
- 3.11.3 The proposed Scheme includes a proposed improvement section of trunk road over a total length of 1.8km. The redundant sections of the existing A40 road between Penblewin and Redstone Cross would be reclassified and cease to be a trunk road, reverting to the local authority.

- 3.11.4 The Scheme would commence approximately 550 metres west of Redstone Cross (Chainage (Ch) 0+000), where the existing ascending A40 passes Sodston Lodge. The Scheme would leave the line of the existing A40 at Sodston Lodge and draw gradually to the south. At approximately Ch 0+400 the road would cross a small wooded watercourse on an embankment up to 4 metres high. It would then begin to descend on a gentle gradient for about 1km, entering a cutting up to 7 metres deep through the Redstone ridge at Ch 0+500. To the north side of the scheme would be properties at Redstone Cross and to the south the Blaenmarlais Care Home. The B4313 Redstone Road would cross the A40 on a proposed bridge at Ch 0+570 and then join the detrunked A40 on the east side of Redstone Cross. The detrunked existing A40 road would be a local road extending from Redstone Cross to Penblewin roundabout.
- 3.11.5 From Ch. 0+570 to Ch 0+800 the Scheme, still descending, would transition from cutting to embankment and continue the gentle left-hand curve to cross a small watercourse at around Ch.860. Here the Scheme would gradually transfer from cutting to embankment to cross lower-lying land occupied by woodland. The embankment would continue eastwards, crossing a further two minor watercourses, with the Scheme entering a shallow right-hand bend which would continue to Ch. 1+450. At Ch. 0+400 the embankment would cease, and the Scheme would continue east in a cutting up to 8m deep as it commences the climb towards Penblewin Roundabout at Ch. 1+760, which is roughly at ground level.

Overbridge for the B4313 Redstone Road (Narberth to Bethesda)

- 3.11.6 The proposed bridge would carry the B4313 Redstone Road across the proposed trunk road (Ch 0+570), which at that point would be in a cutting up to 7m deep. The bridge would be sufficiently wide to carry the existing road with hardened verges to be consistent with the existing road width. The bridge would be a single span structure with abutments, constructed from concrete with precast concrete beams.

Penblewin roundabout

- 3.11.7 At Penblewin the Scheme would re-join the A40 trunk road at the enlarged roundabout previously proposed for the Llanddewi Velfrey to Penblewin Improvements scheme, which forms a separate set of Draft Orders. The enlarged roundabout would extend further north and west than the existing and would serve the A40 trunk road, the A478 and the trunk road link to the Penblewin Rest Area. In addition, a sixth arm would be required for a new short link to the detrunked A40 west to Redstone Cross.

Design speed and traffic flows

- 3.11.8 The Design Speed of the proposed Trunk Road is 100kmph and will be subject to national speed. Side Roads will be in keeping with the existing local road network.

3.12 Active Travel and Detrunking proposals

- 3.12.1 The proposed Scheme would replace the existing trunk road located between Jacob's Park and Penblewin Roundabout. The existing section of road would no longer form part of the trunk road network and would be detrunked.
- 3.12.2 Traffic flows are expected to significantly reduce throughout the detrunked road. All through traffic would use the proposed A40 carriageway.
- 3.12.3 The proposed Active Travel and Detrunking measures that are being considered to be included within the Scheme are as follows:
- a) the detrunked A40 would be maintained at 7.3m;
 - b) the speed limit would be reduced to 40mph;
 - c) a new unsegregated shared pedestrian and cycle track would be provided in the verge with an alignment which best utilises existing space; and
 - d) existing VMS and VRS to be removed.
- 3.12.4 The measures listed above complement the main Scheme objectives and comply with the requirements of the Active Travel Act, and the Well-being of Future Generations (Wales) Act 2015.

- 3.12.5 PCC have recently (at time of preparing the Stage 3 Report) undertaken a WelTAG Stage 2 study focusing upon sustainable travel within Narberth. There are opportunities for a possible Scheme resulting from this study to be complementary to the Active Travel and detrunking proposals for the Scheme.
- 3.12.6 PCC have aspirations of developing and enhancing an east-west walking and cycling facilities between and Haverfordwest and Blackpool Mill (near Bluestone Resort); and Narberth to Canaston Bridge. The conceptual proposals were discussed with PCC at a meeting on 21 October 2019. The Active Travel and Detrunking proposals discussed in this section would be complementary to these aspirations.

3.13 Impact on traffic in Narberth

- 3.13.1 Concern has been raised by the public regarding the impact of the Scheme upon the traffic, in particular HGVs, within the town of Narberth. The traffic modelling undertaken has demonstrated that there is no adverse impact upon vehicle movements in Narberth as a result of the Scheme. The Redstone Cross Junction provides access to and from the west (Haverfordwest) to the industrial estates and property to the north of Narberth along Redstone Road. Access from the east would be via the Penblewin Roundabout and along the existing A40 (that would be detrunked).

3.14 Design Features

Earthworks

- 3.14.1 The Scheme would be carried across the site through a series of cuttings and embankments. The earthworks proposals are set out in ES Chapter 16, Materials.

Road Drainage and Disposal of Water

3.14.2 The Scheme surface water drainage system would be designed in accordance with DMRB (HD45) and would use conventional piped drainage to remove water from the carriageway which would discharge into five attenuation ponds located beside the proposed road, two for mainline drainage and three for side road drainage. These ponds would be designed to store surface water and then slowly discharge it to the existing watercourses. The attenuation ponds and other drainage measures are set out in ES Chapter 7, Road Drainage and Water Environment. Consideration of Sustainable Urban Drainage (SUDs) is also addressed in Chapter 7. The attenuation pond locations are shown on the Environmental Masterplan drawings (which are included in ES Volume 3 Appendix 2.7) and listed below:

- a) Ch. 0+040 south side – mainline drainage network
- b) Ch. 0+300 south side - side road drainage network;
- c) Ch. 0+780 north side – side road drainage network
- d) Ch. 1+350 south side – mainline drainage network;
- e) Ch. 1+750 south side – side road drainage network.

Fencing

3.14.3 Fencing would be provided in the form of timber post stock-proof mesh where there is a requirement to discourage access by farm stock from adjacent fields and to delineate the Welsh Government land ownership. Post and wire stockproof fences are proposed because these have a much-reduced visual impact compared to post and rail stockproof fences, whilst still forming an effective stockproof barrier. Special forms of this fence would be required to discourage mammals such as badger and otter from entering the road corridor and so reduce the risk casualties arising from collisions with vehicles. Further fences would be required to discourage access to hazardous locations, such as balancing ponds, the tops of retaining walls and steep slopes. Indicative alignments of proposed fences are shown in the Environmental Masterplan included in ES Volume 3 Appendix 2.7.

Signs and communications

- 3.14.4 The proposed section of trunk road would incorporate signage in relation to junctions and destinations. The approximate locations of signs are indicated on the General Arrangement drawings in Volume 3 Appendix 2.6. A symbol is used to show the location but does not indicate actual sizes of signs.
- 3.14.5 The existing A40 has a matrix information sign (MS4) located east of the Redstone Cross Junction, in the westbound verge. This is used to inform road users of route information. The scheme proposes to replace this sign on the realigned A40, to the east of the proposed Redstone Cross Road overbridge. There is no other Intelligent Transport Systems (ITS) proposed on the Scheme.
- 3.14.6 Signs would conform with the national standards, regarding materials, colours, dimensions and Welsh Language. These signs would be suitably placed on or at the back of the verge in accordance with standard requirements. There is only a limited possibility to vary the locations of these signs, but care would be taken to place trees, shrubs, hedges and other mitigation measures to avoid compromising visibility splays and sightlines. During detailed design of the Scheme the placing of signs and mitigation would be considered carefully to ensure that signs do not cause unnecessary visual impact nor compromise the quality of mitigation.

Lighting

- 3.14.7 Road lighting is proposed around the roundabout at Penblewin. The remainder of the proposed trunk road would not be illuminated.
- 3.14.8 Luminaires would be designed to emit no light above the horizontal level. LED Luminaires are proposed as these can be aimed more precisely, reducing light spill and thus causing less disruption to bats and other nocturnal wildlife in the surrounding countryside.

Landscape and Environmental Design Principles

3.14.9 The purpose of the proposed Scheme is to provide a road in accordance with the scheme objectives and with the requirements of highways design standards. Achieving a design that satisfies these objectives and standards requires the benefits of the scheme to be balanced against adverse effects. Known environmental constraints, such as residential properties, designated heritage sites and nature conservation sites, terrain, watercourses and vegetation cover were taken into consideration during route selection. Numerous minor adjustments were made to avoid or minimise impacts during the design period, as more detailed environmental data about the area, and comments and advice from stakeholders in the community and consultees were obtained. Based on this information the following landscape and environmental design principles have been put in place:

- a) Minimising and mitigating any adverse impacts on the quality of views to and from surrounding receptors;
- b) Using opportunities to open-up views from the new road to the immediate landscape;
- c) Minimise the loss of mature vegetation during the development of the alignment;
- d) To protect cultural heritage features, or to provide mitigation and enhancements of the setting, where opportunities fall within the boundary of the scheme;
- e) Unless specifically to serve a localised landscape pattern, to use locally indigenous species of trees and shrubs;
- f) Provide replacement trees, woodland, scrub and grassland to reflect the patterns of the surrounding landscape using native and locally sourced seed and stock;
- g) Using new hedges, hedge-banks and areas of scrub and new woodland planting to reinstate the locally distinctive landscape patterns of boundaries and vegetation;
- h) Making minor modifications to the design of the new landform of embankments and cuttings to help incorporate the new road within the natural landform and to reduce the apparent scale of change in the landscape;
- i) Carefully consider the design and integration of proposed structures into a sensitive landscape throughout the design process with careful selection of materials and planting treatments;
- j) Carefully consider the design and siting of proposed road signs, environmental barriers and street furniture., and

- k) To support principles set out in any relevant Ministerial Initiatives, such as Green Corridors;
- l) Minimising changes to existing watercourses, with new crossings designed to retain the existing capacity and avoid realignment;
- m) In support of the purposes of the Well-being of Future Generations Act (2015) and the Active Travel (Wales) Act 2013, to use opportunities to incorporate measures that would maintain and enhance the existing network of routes available for non-motorised travellers including routes between and through settlements and interesting circular routes. Take opportunities to create new safe and useful routes within the boundaries of the new scheme to encourage public use;
- n) Using design of the carriageway, structures, earthworks and landscape to incorporate the connectivity requirements of indigenous native species. Where necessary to provide barriers to movement, or to reinstate safe routes across the proposed road so that natural patterns of movement are not unduly interrupted and casualties from collisions with vehicles are minimised;
- o) Where possible, avoid or minimise lighting, using products that minimise light spillage / bat-friendly lighting;
- p) In support of the purposes of the Environment (Wales) Act 2016, Section 6 Duty, to use opportunities to incorporate measures that would seek to maintain and enhance biodiversity so far as consistent with the proper exercise of functions and in so doing promote the resilience of ecosystems;
- q) Address farm severance to maintain viable farms and useable fields.

3.15 Objectives appraisal

- 3.15.1 Overall, the do minimum option would not achieve the identified objectives. With limited change to the current situation and predicted growth in terms of both population and traffic on the A40, the existing problems would continue.
- 3.15.2 The preferred option is expected to perform well against all of the Scheme objectives other than Objective 8 (give due consideration to the impact of transport on the environment and provide enhancement when practicable) as presented overleaf:

Table 6 Objectives Appraisal

O 1	<p>To enhance network resilience and improve accessibility along the east-west transport corridor to key employment, community and tourism destinations</p> <p>The Scheme would provide the maximum extent of 2+1 carriageway thereby maximising safe overtaking opportunities. This in turn would also have the benefit of resulting in improved network resilience and journey time reliability.</p> <p>Whilst the journey time savings under average conditions would be slight, the journey time reliability benefits would be significant given the problems of platooning would be avoided.</p> <p>The Traffic Forecasting Report explains how Congestion Reference Flow (CRF) is used to identify 'stress points' in the existing road network. Where the stress factor lies between 0.85 and 1.00, turbulent traffic conditions are likely to be experienced as congestion starts to build up. This is the consequence of having only a low reserve capacity on the road network during peak hours and therefore the effect small incidents of vehicles braking can have on other road users when stress factors are within this range.</p> <p>The highest modelled 'stress factor' shown on the stretch of A40 Penblewin to Redstone Cross reaches a value of 0.50 by 2051. Whilst the Traffic Forecasting Report indicates that the road is expected to operate under free-flow conditions with journey time reliability issues expected to be marginal, the Scheme would significantly address perceived journey time reliability issues as demonstrated in the development of the strategic case for the Scheme, its problems and stakeholder engagement results. Traffic forecast data indicates the traffic and journey time benefits that the Scheme would provide, which would improve network resilience and accessibility to the to key employment, community and tourism destinations.</p> <p>As a key east-west route, the Scheme would improve accessibility along the A40 to key towns such as Haverfordwest and Carmarthen. This would provide associated benefits for car-based journeys as well as accessibility for those using public transport. Enhanced provision for pedestrians would improve access to the bus stop connection in the village, serving key employment, community and tourism destinations by public transport.</p> <p>The offline nature of this option is considered to offer resilience in terms of providing a wholly new section of carriageway for the A40 Penblewin to Redstone Cross. This would all be built to modern standards and maintenance would reflect this.</p> <p>Further detailed evidence is available in the Traffic Forecasting Report 2020, and Economic Assessment Report 2019.</p>	+++
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O 2	<p>To improve prosperity and provide better access to the county town of Haverfordwest, the Haven Enterprise Zone and the West Wales ports at Fishguard, Milford Haven and Pembroke Dock.</p> <p>As a key east-west route, the option would improve accessibility along the A40 to key towns such as Haverfordwest and Carmarthen as well as key employment areas. Maximising the extent of 2+1 carriageway would provide the maximum benefit in terms of journey reliability and wider prosperity.</p> <p>Traffic forecast data indicates the traffic and journey time benefits that the Scheme would provide, which would improve network resilience and accessibility to key employment, community and tourism destinations.</p> <p>The improvements would bring up to modern standards the lowest standard of TEN-T road in the UK and would provide a fit for purpose strategic access to the key communities and employment areas in the region and beyond.</p> <p>Further detailed evidence is available in the Traffic Forecasting Report 2020 and Economic Assessment Report 2019.</p>	++
O 3	<p>To reduce community severance and provide health and amenity benefits</p> <p>The Scheme would serve to improve access to residences and businesses along the existing A40 route.</p> <p>Reduced traffic in proximity to residential buildings would deliver associated improvements in terms of traffic related noise and air quality, which are set out in detail in the corresponding ES Chapters.</p> <p>Further detailed evidence is available in the Traffic Forecasting Report 2020 in relation to the expected traffic changes.</p> <p>In addition, improved active travel routes for WCHRs would have knock on health and amenity benefits for residents and visitors.</p>	++

O 4	<p>To improve the Redstone Cross Junction safety (including perceived safety) and reduce the number and severity of collisions</p> <p>Accidents along this stretch of the A40 tend to be serious in nature. By creating 2+1 carriageway and increased opportunities for overtaking it is considered that the Scheme would reduce the number of risky manoeuvres being undertaken by motorists and driver frustration which can lead to more dangerous driving. This could in turn reduce the likelihood of collisions and by association the number of potential accidents (now and in the future).</p> <p>The proposed overbridge provides opportunities for north-south travel with reduced interface between WCHRs and motorists which could also enhance safety.</p> <p>The proposed junction onto the A40 eastbound from Redstone Road has been designed to improve driver visibility and the ability to merge onto the road safely.</p> <p>Overall the types of severe accidents that are associated with the current road conditions would be mitigated, with significant benefits to be realised by the improved road safety conditions.</p> <p>Over a 60-year period, the Scheme would result in a saving of 18 accidents with 28 less casualties. Of these 28 casualties, forecasts indicate that there would be one less fatality, three less casualties with serious injuries and a reduction of 24 casualties with slight injury severity.</p> <p>The option also provides a bypass of the existing A40 and therefore removes potential conflict between vehicles and WCHRs within the village.</p> <p>Evidence related to road safety is provided in section 3.2.64-73 of the IAR.</p> <p>Further detailed evidence is available in the Initial Traffic and Accident Data Report.</p>	+++
O 5	<p>To promote active travel by cycling, horse riding and walking to provide opportunities for healthy lifestyles</p> <p>The Scheme would serve to enhance active travel by providing opportunities to improve/enhance WCHR links between nearby settlements. The provision of safer links for WCHRs e.g. the proposed overbridge is also considered to increase uptake for active travel in the area. In addition, the Scheme would not adversely impact any existing PRoW.</p> <p>The impact of the Scheme on non-motorised users is presented in further detail in the WCHR Assessment Report.</p>	++

O 6	<p>To deliver a scheme that promotes social inclusion and integrates with the local transport network to better connect local communities to key transport hubs</p> <p>Although the option in itself is unlikely to encourage modal shift, it would provide slight benefits for journeys to key public transport hubs through improvements to journey time reliability. Reduced severance and improved connectivity would benefit social inclusion.</p> <p>Improved access to employment opportunities would also benefit social inclusion.</p> <p>Social and cultural conditions which the Scheme could impact are described in section 3.3 of the IAR, in addition the Walking, Cycling and Horse-riding Assessment Report describes the assessment of effects for all travellers, including provision for pedestrians, cyclists and equestrians (Non-Motorised Users).</p>	++
O 7	<p>Deliver a project that is sustainable in a globally responsible Wales, taking steps to reduce or offset waste and carbon</p> <p>Chapter 18 of the ES identifies that over the whole life of the Scheme, there will be an increase in emissions associated with the Scheme. The increase is being driven by capital carbon emissions relating to the construction phase of the project. Over the 60-year appraisal period, the total emissions from the construction, operation and use of the road are expected to increase by 0.9% compared to the 'do minimum' scenario. The net increase in GHG emissions is not considered to have a material impact on the ability of the Government to meet its carbon reduction targets and will not give rise to a significant effect.</p> <p>Chapter 18 of the ES also concludes that emissions associated with the operational phase of the Scheme would be lower than compared to the 'do minimum' scenario.</p> <p>In order to mitigate this as much as possible, opportunities for carbon reduction have been considered where possible, for example it is proposed to minimise extents of lighting in the Scheme. Carbon reduction would be fully taken into account as the design stages progress and future mitigation measures have been considered such as using local suppliers during construction to reduce the carbon impact of transporting materials to site.</p> <p>Although the option would not encourage modal shift to more sustainable transport options, it would improve connectivity to public transport services.</p> <p>Through maximising the opportunity to overtake, the Scheme would provide benefits in terms of the overall resilience and efficiency of journeys as well as improving access to key employment areas, supporting economic growth and prosperity for all.</p>	0

O 8	<p>Give due consideration to the impact of transport on the environment and provide enhancement when practicable</p> <p>The land take required for the Scheme would require some loss of habitat and impacts on landscape as detailed within ES Chapter 8 but this needs to be balanced against opportunities for mitigation and enhancement and wider Scheme benefits. Proposed mitigation and enhancement measures are also outlined within the ES.</p>	-
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3.16 Well-being Objectives appraisal

- 3.16.1 Whilst much of the previous development work and associated decision making leading up to this latest WelTAG study precedes the WFGA, WelTAG 2017 Supplementary Guidance sets out that:

“When using WelTAG it is essential to comply with the duties set out in the Well-being of Future Generations (Wales) Act 2015. They are to follow the sustainable development principle through following the five ways of working and set well-being objectives that maximise contribution to the seven well-being goals.”

- 3.16.2 The WFGA places a duty on 44 public bodies in Wales, including Welsh Ministers, to carry out sustainable development. This means that each public body must work to improve the economic, social, environmental and cultural well-being of Wales. To do this they must set and publish well-being objectives designed to maximise their contribution to each of the seven well-being goals. Public bodies must then take action to make sure they meet the objectives they set.
- 3.16.3 WelTAG 2017 guidance explains how it is important that the way the WelTAG framework is used for thinking about proposed changes to the transport system, helps public bodies fulfil their well-being duty. It is essential therefore that the sustainable development principle of the WFGA is applied to the way the WelTAG framework is used.
- 3.16.4 The WFGA well-being goals (see Table 4) have been taken into account as part of the objectives for this Scheme (see section 1.4). In developing the objectives, a review was undertaken against the well-being goals as presented within the 2015 Act. This ensures that the Scheme objectives align to the wider sustainable development principle of the Welsh Government and take into account the needs of Wales’ future generations. For example, Scheme Objective 7 is to: ‘Deliver a project that is sustainable in a globally responsible Wales, taking steps to reduce or offset waste and carbon’, which is clearly aligned to the national wellbeing goal to create ‘A globally responsible Wales’. As such, an option that performs well against the objectives is expected to contribute to the well-being goals.
- 3.16.5 As is set out above, the preferred option performs well against most of the Scheme objectives, and as such is expected to contribute positively to the wellbeing goals.

3.16.6 A review has been undertaken of the preferred option to help demonstrate how its implementation would contribute to the well-being goals, by considering the Welsh Government's well-being objectives. The Welsh Government's wellbeing objectives were last updated in its Wellbeing Statement published alongside its Prosperity for All: The National Strategy document. Table 1 of the Wellbeing Statement sets out the Welsh Government's contribution to the well-being goals, explaining how each of its 12 wellbeing objectives aligns to its 4 cross cutting themes and contributes to one or more of its 7 wellbeing goals as shown in Figure 2.



Figure 2 Welsh Government Well-being Objectives and Alignment with Well-being Goals

3.16.7 It is clear that a positive contribution to a well-being objective would align to the cross-cutting strategies and result in a positive contribution to one or more of the well-being goals. A detailed assessment of how the preferred option and the study would contribute to the well-being objectives is provided within the Sustainable Development Report.

3.16.8 From the appraisal carried out within the Sustainable Development Report, it is clear that the proposed solution would result in opportunities to help achieve the wellbeing objectives, thus aligning positively to the cross-cutting strategies, contributing to the wellbeing goals, and helping Welsh Ministers satisfy their duties and obligations under the 2015 Act.

3.16.9 The Act also outlines five key ways of working that the Welsh Government is obliged to take account of and its objectives have been framed by the ways of working:



3.16.10 A review of how the project would embed the five ways of working is provided in section 5 of the IAR (The Management Case).

4 Transport Case

4.1 Overview

- 4.1.1 The Transport Case presents the narrative for the preferred option in more detail as to how the proposed solution would meet the need identified in the strategic case and the objectives set. The transport case therefore considers the potential impacts under the headings of social and cultural, environmental and economic.
- 4.1.2 Technical evidence included in the Environmental Statement (ES), Design Options Report and other assessments should be read alongside this Full Business Case, is complementary and has helped inform this WelTAG Stage 3 appraisal.
- 4.1.3 The methodology adopted in appraising the significance and scale of identified impacts uses the seven-point scale as set out in Table 1 of this report.
- 4.1.4 The scoring of the preferred option continues to be made against the do-minimum scenario (doing nothing above what is already planned or committed).

4.2 Appraisal

- 4.2.1 Taking into account WebTAG guidance, a completed Appraisal Summary Table is provided in Appendix C, which provides a quantitative and qualitative analysis of the preferred option, considering its performance in meeting the objectives and in relation to key social and cultural, environmental and economic considerations.
- 4.2.2 The appraisal utilising the latest WebTAG assessment criteria (2018) demonstrates that the Scheme would have the following impacts:

Impact Criteria	Score	
Social		
Physical activity	Moderate Beneficial	++
Journey quality	Major Beneficial	+++
Accidents	Major Beneficial	+++
Security	Moderate Beneficial	++
Commuting and other users	Moderate Beneficial	++
Reliability	Moderate Beneficial	++
Access to services	Moderate Beneficial	++
Affordability		0
Severance	Moderate Beneficial	++
Option values	Moderate Beneficial	++
Environmental		
Noise	Neutral	0
Air Quality	Slight Beneficial	+
Greenhouse Gases	Slight Adverse	-
Landscape	Slight Adverse	-
Historic Environment	Neutral	0
Biodiversity	Slight Adverse	-
Water Environment	Slight Beneficial	+
Economic		
Business users & transport providers	Moderate Beneficial	++
Reliability	Moderate Beneficial	++
Regeneration	Neutral	0
Wider Impacts	Major Beneficial	+++

Public Accounts considerations		
Cost to Broad Transport Budget	Significant Beneficial	+++
Indirect Tax Revenues	Slight Beneficial	+

- 4.2.3 The full appraisal of the Do Minimum and the Preferred Option is presented in section 4.11 of the associated IAR.

4.3 Social and Cultural Considerations

Commuting and Other Users

- 4.3.1 As a key east-west route, the Scheme would improve accessibility along the A40 including to employment sites including the Haven Waterway Enterprise Zone, services and key tourist destinations. It would help reduce the perceived remoteness of the region with improved road conditions and would help benefit potential investment in the region (as indicated in 2015 EALI Study as presented in section 3.2.11).
- 4.3.2 Despite a slight increase in the overall length of the route, maximising the extent of 2+1 carriageway will provide the maximum benefit in terms of journey reliability and wider prosperity. Journey times would improve given the mitigation of platooning effects from port traffic and slow-moving agricultural vehicles etc. This would benefit all vehicle types including commuters and those using public transport services using the existing A40.
- 4.3.3 The proposed new junction off Redstone Road would improve safe access to the A40 for commuters travelling from Narberth (and further south) to Haverfordwest, the primary service centre within the County.

Reliability

- 4.3.4 The Scheme would contribute to improved journey times and journey reliability through the provision of increased overtaking opportunities and increasing the resilience of the network by reducing instances of platooning, particularly in consideration of the seasonal and temporal variations in traffic volumes along the existing A40 (see section 3.2 of the IAR).

- 4.3.5 Business in Narberth (and further south) would benefit from safer and more efficient access onto the A40 as a result of the proposed Redstone Road junction.

Physical Activity

- 4.3.6 It is acknowledged that the Scheme would not serve to encourage large levels of modal shift however, the Scheme provides opportunities to improve/enhance opportunities for WCHR along the existing A40. New lengths of bridleway, footpaths and crossings would be provided.
- 4.3.7 Once open, the Scheme would greatly reduce the volume of traffic on the existing A40, which would greatly benefit non-motorised users. The Scheme could therefore lead to an increase in physical activity within the study area.

Journey Quality

- 4.3.8 The Scheme would provide for approximately 1.2km of 2+1 overtaking opportunities. This would improve journey quality and reduce driver stress. In addition, the existing A40 is currently substandard, as such the modern standard of the new road would also contribute to increasing journey quality.

Accidents

- 4.3.9 A majority of collisions over the study period have been recorded at Redstone Cross junction (see section 3.2 of the IAR). In addition to this, respondents from the Public Information Exhibitions voiced their safety concerns for the junction; many of whom stated their knowledge and/or experience of near-misses at the junction. As such it can be concluded that the Scheme would provide significant improvements to safety, including perceived safety, particularly in consideration of the fact that the Scheme would reduce conflict between motor vehicles and WCHR and a reduction in the overall number of junctions for motorists to negotiate.
- 4.3.10 Maximising the extent of the 2+1 carriageway provides the maximum length of safe, unambiguous overtaking opportunities. This will reduce the number of risky manoeuvres on the road and generally contribute to reducing the potential of accidents.

- 4.3.11 The route would take traffic away from the existing A40 which would in turn provide a local access route for communities. This would also reduce interface between traffic and WCHRs on the existing A40, thereby creating a safer environment and reducing the potential of accidents.
- 4.3.12 The Scheme would improve north/south connectivity for WCHRs. The inclusion of an overbridge will mean that they do not need to negotiate crossing the new route thereby avoiding interaction with the trunk road and the vast majority of traffic.

Security

- 4.3.13 The Scheme would divert traffic away from local access routes, which would be served by the de-trunked existing A40. This would increase the feeling of safety for the local community, particularly those working/visiting farms etc. accessed off the existing A40.
- 4.3.14 With the addition of the overbridge the Scheme would improve the feeling of security for WCHRs who would not need to negotiate traffic using the A40 trunk road.
- 4.3.15 The proposed junction off Redstone Road would serve to enhance motorise visibility and allow for safer manoeuvres for those merging on to the A40 from Narberth.
- 4.3.16 The addition of a 2+1 carriageway would provide safe, unambiguous overtaking opportunities thereby reducing the risk of unsafe manoeuvring and associated accident potential.

Access to Services

- 4.3.17 Pembrokeshire suffers from deprivation in terms of access to services (see section 3.3 of the IAR). The Scheme would serve to improve this by bringing improvements to journey times, improving the resilience of the network and providing better access to services in key settlements such as Narberth and Haverfordwest.

- 4.3.18 Although the option would not directly encourage modal shift onto public transport, it would contribute to improving a key public transport corridor and improve access to key transport hubs such as Haverfordwest and Carmarthen. An improved pedestrian environment and further opportunities for cycling and horse riding between settlements could also provide benefits in terms of access to services.

Severance

- 4.3.19 The Scheme would reduce severance largely due to the removal of a significant proportion of traffic off the existing A40. This would allow the existing A40, of which would no longer be a trunk road, to perform as a local access route and also provide safer opportunities for active travel movements.
- 4.3.20 The Scheme would improve north-south connectivity between Narberth and Bethesda owing to the provision of the proposed overbridge.

Option Values

- 4.3.21 The provision of the 2+1 carriageway configuration provides enhanced opportunities for overtaking between Penblewin roundabout and Redstone Cross, increasing the resilience of the network to cope with a variety of traffic, platooning and seasonal peaks.
- 4.3.22 It is considered that the strategic connectivity benefits would outweigh the increased journey length for some journeys from and to the local communities within proximity of Redstone Cross. For east-west movements towards Haverfordwest, access has been maintained through the provision of a junction which has been designed to modern standards and would serve to enhance safety in this location.
- 4.3.23 It is noted that the options provide limited benefit to users of public transport, although the options would provide improved accessibility to train stations and bus stops.

4.4 Environmental Considerations

Noise

- 4.4.1 As concluded in ES Chapter 14 (Noise and Vibration), there are no adverse or beneficial likely significant effects from operational noise identified in the assessment. For properties where the realigned A40 is closer than the existing A40, adverse likely significant effects have been avoided by the inclusion of landscape/noise mitigation (landscaped bunds) and between the scheme and the properties.
- 4.4.2 Whilst it is anticipated that there would be some residual noise impacts to some properties during construction. This would be temporary and mitigated as far as possible using best practicable means and noise insulation and potential temporary re-housing would be considered. Please see the Pre-Construction Environmental Management Plan (Pre-CEMP) contained in Appendix 2.2 of the ES for more information. The assessment of vibration during construction has been assessed as not significant for all receptors.

Air Quality

- 4.4.3 Standard good practice mitigation measures would be adopted during construction and is in the Pre-CEMP.
- 4.4.4 ES Chapter 13 (Air Quality) concludes that with mitigation in place there would be no residual effects of construction on air quality. Similarly, the operational assessment predicted no significant effect of the Scheme on assessed receptors in the opening year (2022).
- 4.4.5 The scheme will move the main A40 traffic away from the existing road alignment. This will give a benefit to local air quality as a result of the scheme for receptors on the existing alignment of the A40.

Greenhouse Gases

- 4.4.6 Over the 60-year appraisal period, the total emissions from the construction, operation and use of the road are expected to increase by 0.9% compared to the Do Minimum scenario.
- 4.4.7 Further information on GHG and how the design has been influenced by the need to reduce capital and operational emissions can be found in ES Chapter 18 (Climate Change).

Landscape

- 4.4.8 The Scheme would not adversely affect features of high sensitivity such as Registered Historic Park and Gardens e.g. Slebech Park, Landscapes of Outstanding Historic Interest or the Pembrokeshire Coast National Park during construction and/or operation.
- 4.4.9 Notwithstanding the above, there would be some negative landscape impacts most notably on the Narberth Rural Landscape Character Area. This negative impact would be mitigated as far as possible through landscape planting designed to mature year on year with landscape plans showing the planting of trees, shrubs and hedgerows to provide visual screening. Owing to this mitigation the magnitude of impact is expected to decrease over time. Further detail of the landscape proposals can be found on the Environmental Masterplan drawings (which are included in ES Volume 3 Appendix 2.7).

Historic Environment

- 4.4.10 ES Chapter 10 (Historic Environment) concludes that for the majority of receptors identified within 500 metres of the Scheme there is expected to be either a neutral or slight impact during construction with some receptors experiencing an improvement to their setting as a result of the Scheme.
- 4.4.11 In addition, there are no significant operational effects anticipated for cultural heritage assets, and for certain receptors e.g. Redstone Cross Barrow Group, there is expected to be an overall improvement to the setting.

Biodiversity

- 4.4.12 A number of mitigation and enhancement measures have been incorporated as part of the Scheme. In conclusion, the preferred option would result in no adverse impacts on the integrity of the internationally designated sites within the zone of influence; a neutral impact upon habitats of principal importance; a slight adverse impact on some protected species.

Water Environment

- 4.4.13 ES Chapter 7 (Water Environment) concludes that the Scheme would not have significant adverse impacts upon the water environment neither during construction nor operation with appropriate mitigation measures in place e.g. provision of spill kits during construction. Further information on proposed mitigation can be found in Chapter 7 of the ES and in the Pre-CEMP.
- 4.4.14 The forecast reduction in traffic on the existing A40 would provide a potential benefit to the water environment in that the current drainage network is believed to discharge directly to local watercourses, therefore, there would be a beneficial impact upon the water quality of road run-off discharged from the existing highway directly into local watercourses.

4.5 Economic Considerations

Business Users & Transport Providers

- 4.5.1 It is considered that by providing enhanced overtaking opportunities and thereby reducing the risk of platooning, the Scheme would benefit business users and transport providers.
- 4.5.2 It is acknowledged that business users along Redstone Road would experience longer journeys from the A40 (when travelling westbound) however it is considered that overall, they would still benefit from the Scheme owing to improved driving conditions along the A40.

Reliability Impact on Business Users

- 4.5.3 Similar to the above, by providing enhanced overtaking opportunities and reducing the risk of associated problems such as platooning, there would be a beneficial impact on journey times for business users. The proposed Redstone Cross junction would create a safer and more efficient access to the A40 for business in Narberth and further south of the existing road.

Regeneration

- 4.5.4 There is not anticipated to be any beneficial or adverse impacts to the Study Area in terms of regeneration. The Scheme would improve access to key growth areas and strategic sites such as the Haven Waterway Enterprise Zone.

Wider Impacts

- 4.5.5 The route would provide a more reliable east-west connection, which would improve accessibility between communities and places of work.
- 4.5.6 As a key east-west route, the route would improve accessibility along the A40 to key towns such as Haverfordwest and Carmarthen as well as key employment areas. Maximising the extent of 2+1 carriageway would provide the maximum benefit in terms of journey reliability and wider prosperity.
- 4.5.7 Helping reduce the perceived remoteness of the region with improved road conditions would help benefit perceptions of the region in terms of investment and could help stimulate economic activity and job creation (as per the findings of the 2015 EALI Study).
- 4.5.8 The Scheme would provide a new and attractive alternative route, forming a key part of the wider highway network serving the local economy and wider regional centres including the Haven Waterway EZ and Swansea Bay City Region. Furthermore, this option provides greater highway capacity, which would future proof the route to accommodate traffic volumes in a high growth scenario with greater economic prosperity.

Further Information

- 4.5.9 To explore the evidence base that has informed the appraisal scoring in more detail please refer to the following sources:
- a) The Initial Traffic and Accident Data Report
 - b) The Impact Assessment Report
 - c) The Economic Assessment Report
 - d) The ES.

4.6 Value for Money

- 4.6.1 The Scheme's Economic Assessment Report 2019 sets out how WebTAG Guidance provides details of the default economic data that should be adopted for the economic appraisal of transport schemes. Transport User Benefits Assessment (TUBA) software, which has been applied in this case, has a standard economics file that contains the default data from WebTAG. The proposed opening year for the Scheme is 2022. It is assumed that construction of the Scheme would commence in 2021. The appraisal covers a 60-year period, starting with the Scheme opening year of 2022.
- 4.6.2 Section 6.1 of this report provides information about the cost profile. Cost, risk and optimism bias assumptions have been provided by the Welsh Government. Table 2.2 of the Economic Assessment Report 2018 gives a detailed breakdown of the Scheme cost estimate, including a summary of the input costs to TUBA. The cost estimate is £23,021,469.39 based upon 2018 prices (excluding VAT and inflation to completion).
- 4.6.3 The calculation of transport user benefits is based on outputs from the A40 Llanddewi Velfrey to Penblewin transport model. A description of the development and validation of the model are given in the Local Model Validation Report⁹, while details of the traffic forecasts produced by the model are provided in the Traffic Forecasting Report¹⁰.
- 4.6.4 To be clear, an adjusted BCR hasn't been created because journey time reliability benefits under modelling conditions have been judged to be minimal. That is because the A40 is not forecast to be congested during typical operational conditions but instead experiences journey time reliability problems outside of typical operating conditions e.g. temporarily when there are agricultural vehicles or ferry traffic in platoons. That is not to say there are not likely journey time reliability benefits to be had – indeed this study demonstrates that there are – but they cannot be captured as part of the traffic model and as such cannot be quantified.

⁹ A40 Llanddewi Velfrey to Penblewin Improvements, Local Model Validation Report, Ove Arup and Partners, October 2017

¹⁰ A40 Llanddewi Velfrey to Penblewin Improvements, Traffic Forecasting Report, Ove Arup and Partners, November 2018

4.6.5 A positive NPV and a BCR greater than unity indicate that the benefits due to the Scheme outweigh its costs and so it is positive in economic terms. The higher the NPV and BCR, the better the value for money of the Scheme.

4.6.6 A summary of the economic assessment results for the Scheme is shown below (see Table 4.5 of the Economic Assessment Report).

Table 7 Summary of Economic Assessment (Central Growth)

		Results (£000)
User Benefits	Consumer	1,583
	Business	1,424
Accident Benefits		1,147
Greenhouse Gas Impacts		60
Air Quality Impacts		11
Noise Impacts		108
Indirect Tax Revenues		-93
Present Value of Benefits, PVB (£000)		4,250
Present Value of Costs, PVC (£000)		16,307
Net Present Value, NPV (£000)		-12,057
Benefit-to-Cost Ratio, BCR		0.26

4.6.7 A BCR of 0.26 indicates that the costs of the scheme outweigh the quantifiable benefits. However, the BCR is not the only indicator of value for money, particularly for smaller scale schemes which achieve a broad range of objectives which is the case here. It should also be considered that the Penblewin to Redstone Cross Improvements need to be seen in the context of the overall A40 corridor improvement, of which it forms an integral component.

4.6.8 It should also be noted that the economic appraisal considers a narrow range of impacts limited to travel times and costs experienced by users during operation, as well as changes in indirect tax and greenhouse gas emissions. For highway schemes, these impacts typically account for the vast majority of quantified benefits.

- 4.6.9 In practice, transport schemes seek to achieve a wider range of objectives. It is important to place the BCR into this context.
- 4.6.10 The EALI study 2015 identified a number of mechanisms through which improvements to the A40 could deliver wider economic benefits in addition to the transport user benefits taken into account in the BCR. These were as follows:
- a) Widening the labour market;
 - b) Population retention and immigration;
 - c) Improved business performance
 - d) Scheduling benefits;
 - e) Perceptions of remoteness;
 - f) Inward investment;
 - g) Enhanced prospects for the Enterprise Zone;
 - h) Increased residential development;
 - i) Increased trade; and
 - j) Improved strategic rail access.
- 4.6.11 As set out in section 2 of the 2018 Economic Assessment Report, in respect of any potentially monetisation of wider economic benefits, two factors need to be taken into account:
- a) The economic appraisal is undertaken at a UK level and therefore captures only those economic benefits which are additional at a UK level. Many of the impacts listed above (for example, inward investment) represent a transfer of economic activity from one part of the UK to another. Hence, the impacts may be additional to Wales but do not represent a benefit to the UK economy overall; and
 - b) Related to this, WebTAG guidance on the quantification of wider economic benefits is not well suited to the expected economic benefits of the Scheme. The ‘Wider Impacts’ methodology in WebTAG is focussed on ‘agglomeration effects’ – the benefits of improving access between firms. Agglomeration effects are essentially an urban phenomenon. Given the rural nature of the A40, undertaking an assessment of agglomeration effects is not considered to be appropriate and, in any case, any such assessment would be unlikely to substantially influence the BCR for the Scheme.

- 4.6.12 As noted, the economic appraisal captures some aspects of the environmental impact of the Scheme in relation to noise impacts on households, air quality impacts and changes in greenhouse gas emissions. There are a range of other environmental and social impacts of the Scheme that have a bearing on quality of life and also need to be taken into account in decision making.
- 4.6.13 The degree to which the economic appraisal reflects the Scheme objectives is explored in the tables above. Table 8 demonstrates that many of the expected benefits of the Scheme are not captured in the BCR calculation.

Table 8 Scheme Objective BCR Benefit Capture

Scheme Objective	Degree to which BCR captures the benefits of achieving the Objective
To enhance network resilience and improve accessibility along the east-west transport corridor to key employment, community and tourism destinations.	Indirectly captured Economic appraisal does not measure economic outcomes although many of these derive from journey time savings which are captured. Access to tourism destinations is affected by seasonal variations in traffic flows which are only partially captured. Improved network resilience is not captured.
To improve prosperity and provide better access to the county town of Haverfordwest, the Haven Enterprise Zone and the West Wales ports at Fishguard, Milford Haven and Pembroke Dock.	Indirectly captured Economic appraisal does not measure economic outcomes although many of these derive from journey time savings which are captured.
To reduce community severance and provide health and amenity benefits.	Not captured
To reduce the number and severity of collisions.	Partly captured Benefits of reduced accidents will be included in economic appraisal. Indications are that these benefits will be negligible although official accident statistics may not reflect expert views on safety.

Scheme Objective	Degree to which BCR captures the benefits of achieving the Objective
To promote active travel by cycling, horse riding and walking to provide opportunities for healthy lifestyles.	Not captured
To deliver a scheme that promotes social inclusion and integrates with the local transport network to better connect local communities to key transport hubs.	Not captured
Deliver a project that is sustainable in a globally responsible Wales, taking steps to reduce or offset waste and carbon.	Partly captured Vehicular emissions are included although environmental impacts during construction are not assessed.
Give due consideration to the impact of transport on the environment and provide enhancement when practicable.	Not captured

4.6.14 In summary, with a BCR of 0.26, the Scheme would be assessed as offering poor value for money, although it is acknowledged that the BCR does not capture all of the objectives of the Scheme, taking into account there would be modest localised improvements that can be quantified.

4.6.15 Key in this respect, is the fact that the Scheme objectives sets out the Welsh Government's intention to deliver benefits in relation to enhanced network resilience, improved prosperity and reduced community severance which are only partially reflected in the quantified economic analysis set out in this report.

4.6.16 Where a Scheme has a poor BCR, decision makers need to consider whether the non-quantified benefits are sufficiently important to justify the investment given the remaining 'gap' between quantified costs and benefits.

5 Management Case

5.1 Overview

- 5.1.1 The Management Case considers delivery arrangements for the project to include management during the lifetime of the project moving forward. It demonstrates that the project is achievable and outlines the arrangements that have been put in place or will be considered further at the next stage (WelTAG Stage 4).
- 5.1.2 This case will need to be updated when a new Design and Build (D&B) Contractor is procured, following completion of Key Stage 4 of the project.
- 5.1.3 The A40 Penblewin to Redstone Cross Improvements Key Stages 3 and 4 was instructed by the Welsh Government to be undertaken as an additional element to the A40 Llanddewi Velfrey to Penblewin Improvements.
- 5.1.4 The Welsh Government initially appointed Carillion as the Contractor responsible for construction for the Design Development phase under an Early Contractor Involvement (ECI) form of Contract. Carillion entered liquidation in 2018 and no longer form part of the project team. This results in a change from the original Early Contractor Involvement (ECI) method of delivery.
- 5.1.5 There are several references within the following sections to the ECI Contract. This is the contract between Welsh Government and Carillion and the contract clauses referenced will carry through into any future D&B contractor procurement.

5.2 Project Plan

- 5.2.1 The project is being delivered using the NEC Engineering and Construction Contract. These types of contract have been successfully used on a number of schemes including the A40 Penblewin to Slebech Park, A477 St Clears to Red Roses and A465 Heads of the Valley Dualling, Sections 2 and 3.
- 5.2.2 The Scheme is split into three key stages which cover design, statutory process, construction and aftercare in accordance with the Welsh Government's Transport Division's Key Stage Approval Process. Figure shows the project timeline and key stages. The KSA process provides a staged financial approval system to manage the process of projects from inception, through to construction and initial maintenance and complies with the principles of PRINCE2 project management:

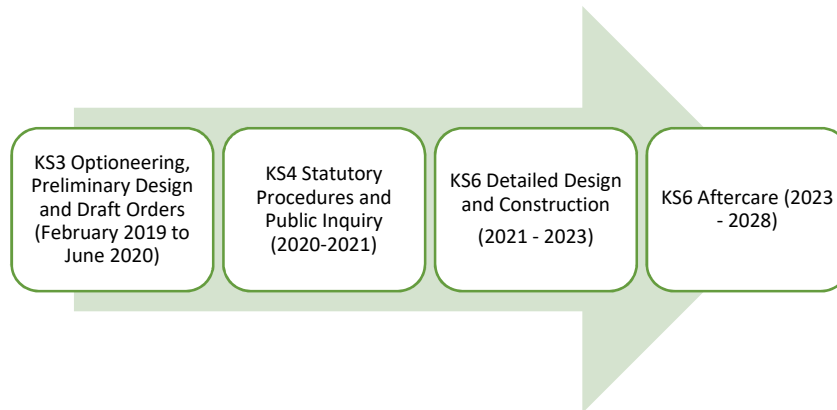


Figure 3 Project Timeline

Key Stage 3

- 5.2.3 Key Stage 3 (KS3) is from the instruction from Welsh Government to proceed with the commission on the Penblewin to Redstone Improvements until the publication of draft Orders. It includes Optioneering, Preliminary Design and setting of land required for the Scheme and associated Statutory Orders required to obtain land via Compulsory Purchase Order (CPO) and any need to designate new sections of road as trunk road. This will be delivered by Arup / RML.
- 5.2.4 KS3 is planned to run from February 2019 until July 2020 and involves the development of the outline design and Outline Business Case, preparation of a Scheme Cost Estimate, publication of draft Orders documentation and associated environmental documentation such as the ES.
- 5.2.5 An ES and other technical assessments are submitted alongside the draft Orders for the Scheme. Statutory Orders are prepared by Welsh Ministers and published in draft. The draft Orders for the Scheme include the following:
- a) A draft Line Order to provide for the new section of trunk road and the reclassification of the existing A40 (de-trunking);
 - b) A draft Side Roads Order to deal with local highway issues (including roads, footpaths, bridleways, byways and cycleways) and private access issues. Side Roads Orders can relate to closure, diversion, improvement or new provision; and
 - c) A draft Compulsory Purchase Order, which provides for the acquisition of the land and rights required.

Key Stage 4

- 5.2.6 Key Stage 4 (KS4) is from publication of Draft Orders through a statutory process to Notice to Proceed to Construction. A Public Local Inquiry may be held if deemed necessary by the Welsh Government. This will be delivered by Arup / RML. KS4 is planned to run from July 2020 to July 2021 and involves completion of statutory processes, including publication of the draft Orders, Orders Exhibitions, dealing with objections, and representations, preparation for and conduct of the Public Inquiry (if required), finalising the Orders and preparing Contract Documentation ready for the procurement of the Design and Build (D&B) Contractor.
- 5.2.7 Table 9 below identifies the illustrative key dates associated with Key Stage 4 programme requirements.

Table 9 Outline Key Stage 4 Programme

Event	Time in weeks after contract award
Start of Key Stage 4	0
Publication of draft CPO	3
Public Orders Exhibition	3
End of Objection/Comment Periods	6
State of Public Inquiry	22
Inspector's report received	32
Review of SASICOM Annex IV (if required)	-
Minister's Decision Letter (approx. 3-4 months after receipt of Inspector's Report depending on complexity of issues)	42
Confirmation of Orders (approximately 3-4 weeks after Minister's decision)	44
High Court Challenge Period begins	44
End of High Court Challenge Period	50
Notice to Treat	52

Key Stage 5

- 5.2.8 During Key Stage 5 (KS5) for the Llanddewi Velfrey to Penblewin Improvements Scheme a Design and Build (D&B) Contract will be procured in compliance with European Union Procurement Directives¹¹ and the corresponding UK Public Contract Regulations 2015. Further detail of this is provided within Section 7 of this Report. The Penblewin to Redstone Cross Improvements will be delivered through the same contract by the D&B contractor, if the Scheme is successful in completing the Statutory Process and if the Minister decides to publish made Orders.

¹¹ Directive 2004/18/EC

Key Stage 6

- 5.2.9 KS6 involves detailed design and construction of the Scheme including an environmental and landscape aftercare period. The suppliers for this stage of the project are unknown and will be chosen following the procurement process carried out in KS5 if the Minister decides to publish made Orders for the Penblewin to Redstone Cross Improvements.
- 5.2.10 KS6 is planned to run from 2021 and involves the detailed design / construction period for all works, plus environmental, landscape and ecological aftercare and management (up to 2028). KS6 also includes Gateway Review No. 3, preparation of the KSA7 and Completion Report.
- 5.2.11 Table 10 below contains the illustrative programme requirements for Key Stage 6, including the main submission events and anticipated timing.

Table 10 Outline Key Stage 6 Programme

Event	Timing
Commence detailed design	On WG's instruction
Submission of Key Stage 6 programme	2 weeks after commencement of KS6
Submission of Statutory Authorities' diversion works	In accordance with Contractor's programme
Submission of Construction Quality Plan	4 weeks prior to start on site
Submission of Health and Safety Plan	4 weeks prior to start on site
CEMP (update of Pre-CEMP)	4 weeks prior to start on site
Contractor's KS6 Design submission including updated SU Works Report	3 weeks prior to start on site
Submission of Stage 2 Road Safety Audit	In accordance with the Contractor's programme following completion of detailed design
Licences and Consent applications	In accordance with Contractor's programme

Event	Timing
Construction start on site	To be determined by Contractor
Submission of Stage 3 Road Safety Audit	3 weeks (min) prior to road opening
Road opening	To be arranged
Completion of KS6 construction works	104 weeks after Key Stage 6 starting date
Health and Safety File (including all 'as built' and manuals etc.)	At time of certification of Completion by the Project Manager

5.3 Construction Programme

5.3.1 This section outlines the proposed construction sequence and the key construction activities. The detailed design and construction programme allow for a potential Public Local Inquiry in late 2020/early 2021, with a decision to proceed likely in early 2021 ready for construction in 2021.

5.3.2 The details of the construction programme would be updated by the appointed D&B Contractor shortly after award. An overview of the envisaged programme is provided below.

Overall Duration

5.3.3 Detailed design and construction works are currently planned to commence in late 2021 and continue for around 18 months.

5.3.4 Maintenance and aftercare of the environmental aspects of the Scheme remain the responsibility of the Contractor for 5 years after the completion of the Works (likely to be up to 2028).

Sequence of Operations

5.3.5 Following the issue of the 'Notice to Proceed to Construction', there would be a period when the detailed design will be developed. Prior to work starting on site, property precondition surveys and vegetation surveys would be carried out. Early construction activities would be undertaken.

5.3.6 The site would be made secure as early as possible by the erection of permanent fencing. Where this is not possible, temporary fencing would be erected. Site clearance work would commence with vegetation clearance. Main site accesses would be established at either end of the Scheme at the junction locations.

- 5.3.7 Bulk earthworks would mainly be carried out in the summer season but would take advantage of any periods of dry weather in the other seasons. Pre-earthworks drainage would follow the earthworks sequence. Mainline pavement would commence in 2022 and intermittently continue through to completion.
- 5.3.8 Structures would be progressed throughout the construction period. Subject to agreement with a Contractor, the construction sequence would help ensure that the Scheme would be built with minimum disruption to the local environment, local population and the travelling public.
- 5.3.9 The latter stages of construction would include Mainline, side road and tie-in pavement works, Installation of street furniture, such as traffic signs and street lighting and Landscaping and planting of soft estate.

5.4 Contract Management Plan

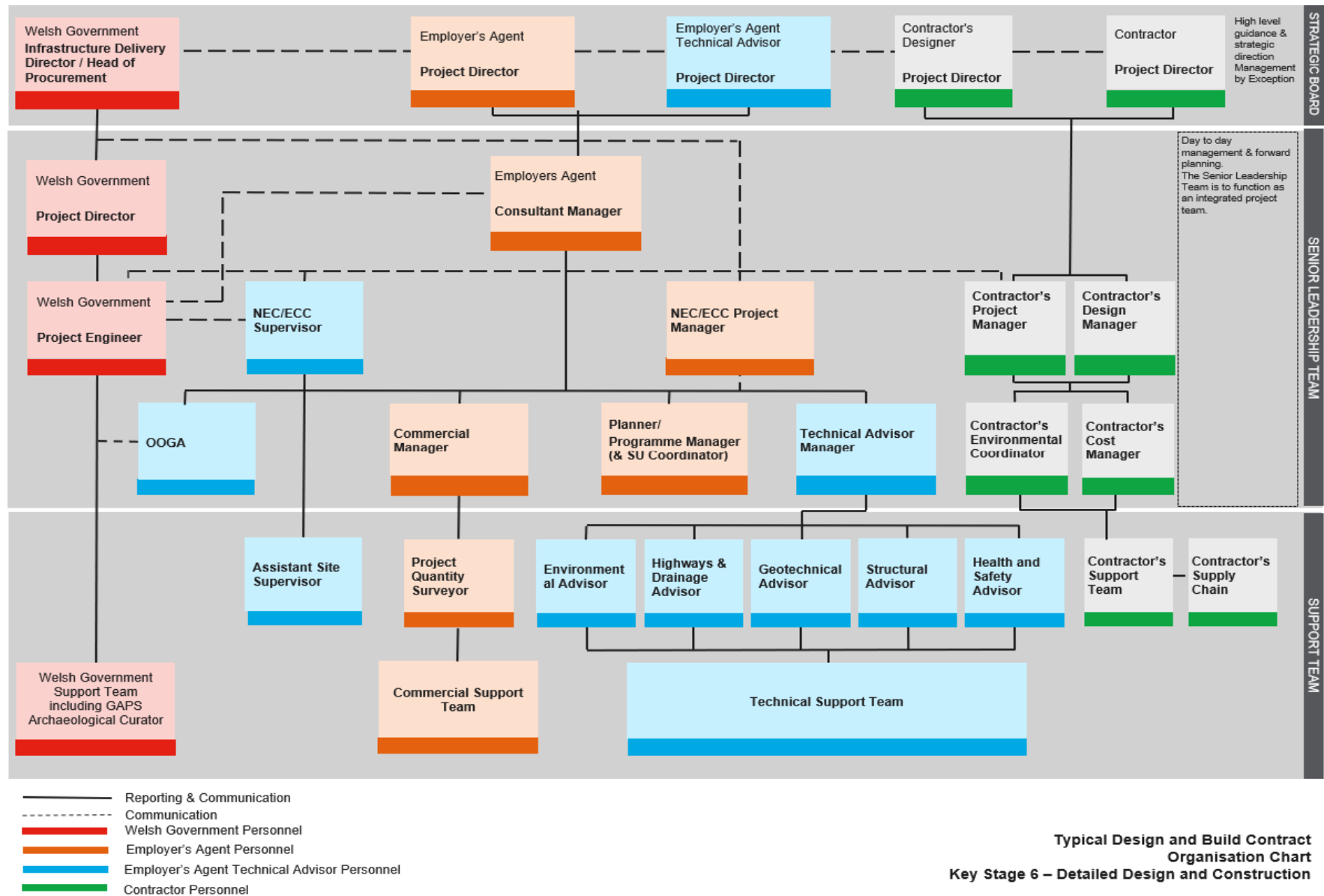
- 5.4.1 The appointed D&B Contractor would likely operate an Integrated Management System (IMS) which would form the foundation for the management of the Scheme. The system would be accredited to appropriate British and international standards.
- 5.4.2 In accordance with the IMS, a Contract Management Plan (CMP) would be developed for the Scheme. The objective of the CMP would be to provide a coordinated approach to the management of the Works and to clearly define policy, standards, processes, procedures, organisation, roles and responsibility and key performance indicators.
- 5.4.3 Under the overall control of the CMP would be:
- a) Health and Safety Management; (see Section 2.12 of the ES);
 - b) Construction Environmental Management Plan (CEMP)
 - c) Quality management (see Section 1.14 of the ES); and
 - d) Public Relations (See Section 2.15 of the ES).
- 5.4.4 The Register of Environmental Actions and Commitments (REAC) would be an appendix to the CEMP. The REAC has been developed throughout Key Stage 3 and will continue to be developed through Key Stage 4 taking into account any changes. This will become a requirement of the D&B Contractor during Key Stage 6.

5.5 Governance, organisational structure and roles

5.5.1 The core parties involved in the delivery of the project are:

- a) Welsh Government (the Employer) – representing the Welsh Ministers. The project is being led by Transport within the Economy and Transport Division, with the Project Director and Project Engineer as the main points of contact.
- b) Arcadis (Employer's Agent) – acting as the Welsh Government's representative, providing financial, project management, contract and technical advice (support from Mott Macdonald) throughout the project.
- c) Arup / RML – employed by the Welsh Government to carry out the preliminary environmental and engineering design for the preferred route, as well as undertake all activities necessary for the publication of orders. They will also support the Welsh Government through the Statutory process. Their involvement in the project will cease at the end of Key Stage 4.
- d) Project Manager and Supervisor: under the NEC ECC Contract. During Key Stage 6 of the contract the role will be undertaken by Arcadis and Mott MacDonald as delegated by Welsh Government.
- e) D&B Contractor: During Key Stage 5 of the project a D&B Contractor will be procured by the Welsh Government (refer to Section 7.3). The D&B Contractor will be responsible for the delivery of the detailed design and construction (Key Stage 6) and aftercare (Key Stage 7) of the Scheme. Figure 4 below sets out a typical organisational structure for the delivery of Key Stage 6 – Detailed Design and Construction below sets out the organisational structure.

Figure 4 Organisational Structure



- 5.5.2 Key Stage 6 of the project is overseen by the Senior Leadership team, who are responsible for the day to day management of the project. The Senior Leadership Team comprises members of the Client (Welsh Government), Employers Agent (Arcadis), the Employers Agent's Technical Advisor's Team and the D&B Contractor.
- 5.5.3 The Strategic Board comprises Project Directors from the various parties involved along with the Welsh Government's Deputy Director of Infrastructure Delivery. Table 11 outlines the participating parties to the Strategic Board for each Key Stage.
- 5.5.4 The Strategic Board will meet by exception with no planned regular meetings. The function of the Strategic Board is to: make decisions and resolve matters that the Senior Leadership Team cannot resolve, secure working relationships; provide strategic direction; and align values and goals.

Table 11 Strategic Board Members

Key Stage	Attendees
Key Stage 3	WG Deputy Director of Infrastructure Delivery/
Key Stage 4	Arcadis Project Director/ Arup Design Director
Key Stage 5	WG Deputy Director of Infrastructure Delivery/ Arcadis Project Director
Key Stage 6	WG Deputy Director of Infrastructure Delivery/ Employers Agent Project Director (Arcadis) / Employer's Agent's Technical Advisor Project Director / D&B Contractors Project Director (TBC)/ D&B Designer Project Director (TBC)

- 5.5.5 WelTAG 2017 specifically requires a Review Group to help steer the appraisal process. A Review Group for the Scheme was established at the outset of the Stage 1 appraisal in order to help ensure that key stakeholders were identified and meet on a regular basis to be involved in any decision making.
- 5.5.6 It is considered that the project risk is low to medium, in light that despite there being some sensitives in terms of environmental impacts and the need for land acquisition, the project benefits from the previous involvement of an experienced ECI Contractor and designer (see WelTAG Stage 2), and that the project involves a well-tested approach to procurement and delivery. As such, the Review Group comprises the Welsh Government's Project Director, in addition to the Employer's Agent, the Designer (Arup) and PCC as the relevant local authority. The Review Group is as outlined in Figure 5.

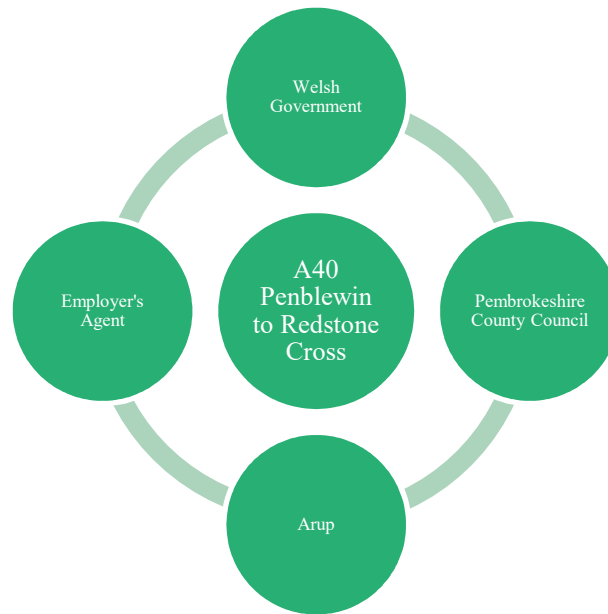


Figure 5 Review Group

- 5.5.7 The Review Group has and will continue to meet at key milestones in each of the WelTAG Stages in order to consider the content of the WelTAG reports and actions to be taken forward to the next stage of the process.
- 5.5.8 The Review Group will also play a key role in advising on the methods to be adopted in assessing impacts of the option(s) to be taken forward for subsequent Stages and should make recommendations in relation to any specific additional evidence and/or modelling requirements.
- 5.5.9 The Review Group will evolve through the project Key Stages. During Key Stage 6 representatives from the D&B Contractor will likely form part of the review group replacing Arup (the D&B Designer).

5.6 Project management and reporting

- 5.6.1 The project is being managed following the principles of the PRINCE2 project management process combined with a compatible web-based project management system. The three Key Stages (KS3, KS4, and KS6) of the project will form the Stage Boundaries within PRINCE2 and will require Project Board approval.
- 5.6.2 The project will be led by Transport within the Economy and Transport Division of the Welsh Government as the Employer. The Employer will also include other individuals, Division and Ministerial portfolios within Welsh Government identified by the Project Engineer and Project Director for the delivery of the project.

- 5.6.3 All interaction with Welsh Government, unless otherwise agreed, will be made through the Project Director or the Project Engineer.
- 5.6.4 Progress meetings will be held at monthly intervals unless otherwise advised. The detailed arrangements for these progress meetings are outlined in the KS3 and 4 contract, Section 2.1 of the Professional Services Contract Volume -2 Scope of Services. Similar requirements will be included within the D&B Contractors Contract. The Project Manager will also hold Quarterly Financial Review meetings.
- 5.6.5 The Project Manager will call a Design Effectiveness Review meeting approximately twelve months after the opening of the scheme to road traffic. The D&B Contractor and a representative of the design team will attend the meeting and be responsible, as directed by the Project Manager, for drafting a brief report on the findings of the review, identifying areas where the project has been found capable of improvement in detail design and particularly identifying elements with a high maintenance liability.

5.7 Public Relations

- 5.7.1 Construction works on this scale would likely result in some inconvenience and disruption to residents. It is therefore very important that there are effective channels of communication in place to keep all interested parties informed of activities and to quickly address any complaints or queries.
- 5.7.2 Arup have appointed a dedicated Public Liaison Officer (PLO) for Key Stages 3 and 4 to keep the public, community, affected landowners and stakeholders informed of progress and advise on forthcoming activities.
- 5.7.3 The PLO would be the first point of contact for any concerns or queries and provides the opportunity for feedback to be provided and taken into account on an ongoing basis.
- 5.7.4 The PLO would be contactable through a project e-mail address, telephone number, by post or in person at the site office.
- 5.7.5 The D&B Contractor when procured would distribute information about the Scheme, including information letters delivered from time to time addressing specific issues to specific residents.
- 5.7.6 The D&B Contractor when appointed would work together with all stakeholders to ensure concerns are addressed through a process of providing information, listening, reviewing, taking action and feedback.

5.8 Risk Management

- 5.8.1 A risk workshop was conducted early in the process with the project team to review and update the Risk Register.
- 5.8.2 This Risk Register is reviewed and would continue to be updated as a minimum, every 3 months during Key Stages 3 and 4, and every 1 month during Key Stage 6.
- 5.8.3 The Project Risk Register provides an estimate of the financial impact (quantified) if each risk is encountered. This has been analysed and the outcome used to inform the risk budget for the project, which is included within the Scheme Cost Estimate.
- 5.8.4 The Risk Register is discussed at each Progress Meeting and would continue to include the following once the D&B Contractor has been appointed:
- a) A description of key risks to the project delivery / cost;
 - b) The likely effect / cost of each risk (quantified);
 - c) The organisation best placed to remove / manage each risk;
 - d) Target dates for action; and
 - e) Hazards with implications under the CDM Regulations.
- 5.8.5 Table 12 provides a summary of some of the top unmitigated risks that are included within the Project Risk Register and outlines the mitigation measures that are proposed.
- 5.8.6 The D&B Contractor would manage risk on the project in accordance with the procedures set out in the latest version of the Value for Money Manual – risk Analysis and Management.
- 5.8.7 At intervals, not exceeding 6 months, the Technical Advisor will carry out a risk identification and assessment exercise and report the results to Welsh Government.
- 5.8.8 The D&B Contractor would be responsible for arranging and taking part in a Risk Workshop, including other advisors where appropriate, to identify risks and take these into account in the preparation of cost estimates in a manner to be agreed with Welsh Government.

Table 12 Summary of Project Risk Register: Top Unmitigated Risks

Risk register I.D.	Description of Risk	Consequence of Risk	Risk Classification	Mitigation
0049	Compensation measures for habitat loss are more significant than anticipated and allowed for in ES / Orders	Increase in Scheme cost	Critical	Use the experience gained from the Llanddewi Velfrey to Penblewin Improvements to help inform the proposal.
0083	Scheme is delayed during KS6	ERDF completion date not being met and some monies not being reimbursed by ERDF and WG having to meet the budget shortfall.	Critical	
0007	Contractor / Sub Contractor becoming insolvent.	Re-tendering whole (or part) work packages and delaying scheme programme.	Very High	
0043	Detrunking works more extensive than anticipated due to higher expectations, aspirations and specification.	Increase to Scheme Costs	Very High	Active Travel and Detrunking Proposal Report prepared and engagement with PCC.
0047	Limited resources in contractor's supply chain (esp locally)	Increase in costs, delay to programme, failure against scheme objectives (community benefits)	Very High	
0065	Minister delays publication of Orders	Delay to programme, increase in cost and ability to deliver the Scheme	Very High	

5.9 Details of legal requirements

- 5.9.1 The Scheme will conform to all EU and UK Environmental Legislation. The Scheme will be delivered under the Highways Act 1980, a Line Order will give the powers to the Welsh Government to create a new trunk road. A Side Roads Order gives the Welsh Government the powers to stop up, improve and create, Side Roads, Private Means of Access and Public Rights of Way. Land required for the Scheme will be acquired via the Acquisition of Land Act 1981 via a Compulsory Purchase Order.
- 5.9.2 The design and construction of the Scheme will be undertaken with due consideration of the Construction (Design and Management) Regulations 2015, the Equality Act 2010, the Active Travel (Wales) Act 2013, The Wellbeing and Future Generations (Wales) Act 2015, Wales Act 2017 and Welsh Language Standards Regulations 2015.

5.10 Communications and stakeholder engagement plan

- 5.10.1 A Communications Plan was drafted in May 2017, initially for the A40 Llanddewi Velfrey to Penblewin Improvements and has been updated several times throughout key stage 3. In May 2019, it was updated to include the A40 Penblewin to Redstone Cross Improvements. The document identifies how all communications between project team members and external parties will be consistently managed to ensure that the needs of the Welsh Government are met at a national, regional and local level to deliver the Scheme.
- 5.10.2 The Communications Plan sets out:
- a) Key communication roles and responsibilities;
 - b) Communication management strategy;
 - c) Public liaison;
 - d) External communications;
 - e) Complaints and enquiries; and
 - f) Communication with the media.

5.11 Benefits realisation plan

- 5.11.1 Requirements will be placed upon the D&B Contractor through their contract to undertake monitoring during the 5 year aftercare period of the Scheme. The requirements of this are likely to be in line with the requirements included in the ECI Contract as detailed in Section 7 of Volume 2 – Works Information. This details the requirement to compile a post-opening report to satisfy that the objectives, indicators and conditions set out in the European Regional Development Fund (ERDF)¹² funding offer letter and Business Case have been achieved¹³. The relevant extract of the Works Information is:

7.4 Post Opening Evaluation & Reporting to WEFO

- 7.4.1 The Contractor will compile a post-opening evaluation report to satisfy the funder, WEFO, that the funding objectives, indicators and conditions set out in the offer letter and in the Business Case have been achieved. The report will provide evidence to key audit scrutiny via the direct reference to objectives, project deliverables and themes set out at the time of such agreement.

5.12 Monitoring and Evaluation Plan

- 5.12.1 Environmental aftercare and management will be carried out for a period of five years following the completion of the works. It will be undertaken in accordance with the agreed Construction Environmental Management Plan Aftercare (CEMPA).
- 5.12.2 Annual Environmental Performance and Monitoring Report (AEPMR) will be prepared to monitor performance, followed by a Final Environmental Performance and Monitoring Report (FEPMR) at the end of the aftercare period.
- 5.12.3 The D&B Contractor will be required to undertake these activities. The previous ECI Contract contains the requirements and it is assumed any D&B Contracts requirements will be similar. Section 7.3 of Volume 2 – Works Information sets out the requirements for monitoring the performance of Environmental Designs. Clause 7.2 of Volume 2 sets out the requirement for an Annual Environmental Performance and Monitoring Report (AEPMR) and Final Environmental Performance and Monitoring Report (FEPMR). The relevant extract of the Works Information is:

¹² Managed by the Wales European Funding Office (WEFO)

¹³ See section 6.5 of this report

7.2 Environmental Aftercare and Management

- 7.2.1 The *Contractor* shall carry out environmental aftercare and management for a period of five years following the completion of the *works*. It shall be undertaken in accordance with the agreed Construction Environmental Management Plan Aftercare (CEMPA) (written in accordance with the requirements of DMRB and associated Procedural Advice and Guidance Notes (PAGs) and IANs.) which will have been submitted to the *Employer* 6 months prior to the end of the construction period.
- 7.2.2 Annual Environmental Performance and Monitoring Report (AEPMR) will be prepared to monitor performance, followed by a Final Environmental Performance and Monitoring Report (FEPMR) at the end of the aftercare period.
- 5.12.4 Six months before the end of the aftercare period, the CEMPA will be updated into a suitable Handover Environmental Management Plan (HEMP) written in accordance with the requirements of DMRB and associated Procedural Advice and Guidance Notes (PAGs) and IANs. The HEMP will cover the management of all environmental features (both hard and soft environmental measures).
- 5.12.5 The HEMP will set out the environmental maintenance and management required for the completed project for the next 10 year maintenance period and will be developed in consultation with Welsh Government and their Environmental Representatives of the Managing Agent responsible for the Trunk Road Network.
- 5.12.6 Road Safety audits are required at the following stages of Key Stage 6:
- a) Stage 2 audit: on completion of the detailed design in Key Stage 6 as part of the Key Stage 6 Design Submission;
 - b) Stage 3 audit: immediately prior to occupation or use of any parts of the permanent works, any remedial works so identified shall be completed before opening of the road to public use except where otherwise agreed with Welsh Government;
 - c) Stage 4 (monitoring) audits: at times in Key Stage 6 aftercare period to be agreed, but normally Stage 4A at one year after opening and Stage 4B at three years after opening to monitor the road's performance in road safety terms.
- 5.12.7 The Road Safety Audits will also cover an area 500m in radius beyond the termination of the works.
- 5.12.8 Traffic and accident data will continue to be collected by Traffic Wales and all personal injury accidents on public roads are reported to the police and recorded using the STATS19 accident reporting form.
- 5.12.9 Stakeholder feedback will continue to be facilitated and taken into account, with the continued role of the PLO.

- 5.12.10 Evidence is required on the actual inputs used when implementing the Scheme and during its on-going operation, what was actually delivered, the impacts experienced, to what extent the intervention met its objectives and how they were achieved. It is considered that sufficient levels of data have been collected at Stage 3 to provide the 'before' data, thus avoiding any requirement for the collection of any further evidence to be carried out in advance of the project's implementation. That data is provided in the following Stage 3 documents:
- a) Initial Traffic and Accident Data Report;
 - b) Traffic Data Collection Report;
 - c) Historic Accident Data Analysis;
 - d) Local Model Validation Report;
 - e) Traffic Forecasting Report;
 - f) Walking, Cycling and Horse-riding Assessment¹⁴; and
 - g) Environmental Statement.
- 5.12.11 In line with the revised WelTAG 2017 guidance, there may be additional requirements for the Contractor to undertake evaluation of the Scheme against the objectives set in WelTAG once they are appointed (being responsible for Stages 4 and 5 of WelTAG 2017).
- 5.12.12 The WelTAG Stage 4 Report will record an immediate post opening evaluation recording the actual outputs delivered and the initial impacts. This should cover the first six months of operation and be completed within 12 months' post opening or completing of the intervention.
- 5.12.13 Then at Stage 5 the Welsh Government should produce a record of what was delivered, an evaluation of the process of delivering the option, a record of the actual impacts compared to the anticipated impacts and an assessment into the extent to which it met the original objectives.
- 5.12.14 The budget required to cover the cost of conducting the highway maintenance and environmental monitoring and evaluation work is included in the design costs of the scheme, outlined at Section 7 of the project Works Information. (provided at 5.1.1 of this report).
- 5.12.15 Accident and traffic data would be available without cost, with traffic count data obtained from Traffic Wales, annual average daily traffic (AADT) data published by the Department for Transport, and personal injury accidents are available using the STATS19 reporting forms.

¹⁴ Previously referred to as a Non-Motorised User Context Report, subject to recent changes in the Design Manual for Roads and Bridges guidance

5.13 Five Ways of Working

- 5.13.1 The Well-being of Future Generations (Wales) Act 2015 sets out five key ways of working that the Welsh Government is obliged to take account of:



- 5.13.2 The Welsh Government is committed to working in accordance with the sustainable development principle. For example, in its Works Information it sets out several requirements for its Contractor that are considered to be generally aligned to the five ways of working as defined in the 2015 Act:
- The Welsh Government asks the Designer (and any future D&B Contractor) to record the consideration given to sustainability through all stages of works. Throughout the duration of Key Stage 6, the contractor maintains a register of consideration of sustainability in optioneering, design, construction and operation methods;
 - The Welsh Government asks the Designer (and any future Contractor) to register the scheme with CEEQUAL. They shall undertake all work necessary to support a CEEQUAL submission including liaison, consultation, meetings and submission of preparation etc. and shall submit for a Whole Project Award (to promote, record and recognise improvements in sustainability and environmental performance). CEEQUAL is an award scheme designed to promote, record and recognise improvements in sustainability and environmental performance in civil engineering projects;
 - The Welsh Government adopts informal partnering with the Designer (and would continue to do so with any future Contractor), including Technical Working Groups and partnering workshops. The objective of partnering workshops is to develop an integrated team. This involves interactive planning sessions focussing on scheme specific issues rather than generic team building sessions;

- d) The Welsh Government requires the use of a web-based project management system for the sharing and management of information within the project. This provides improved communications between the organisations in the team; and
- e) The Designer and any future Contractor must comply with the Welsh Language Scheme and official guidance. All non-technical material made available to the public shall be in Welsh and English, preferably within the same document. This shall include, but is not limited to, material and plans displayed at public exhibitions, questionnaires, newsletters, draft orders and plans, as well as published Scheme documents.

5.13.3 A commentary of how the project would embed the five ways of working is provided below.

Wellbeing Way of Working	How the project embeds the ways of working
1. Looking to the long term so that we do not compromise the ability of future generations to meet their own needs	Section 1.3 sets out how there are transport and economic problems along the A40 now that need to be addressed, Section 4 explains how the proposed solution would provide the long term and sustainable solution to the identified problems and would help achieve the objectives to benefit current and future generations.
2. Taking an integrated approach so that public bodies look at all the well-being goals in deciding on their well-being objectives	Section 3.8 of this report explains how the wellbeing goals were taken into account during the development of the scheme objectives, as well as how the proposed solution would contribute to the wellbeing goals. The Sustainable Development Report focuses upon the contribution towards the Welsh Government's latest well-being objectives. In summary, the project would largely contribute positively and therefore is considered to align well with the sustainable development principle.
3. Involving a diversity of the population in the decisions that affect them	The project has been developed through engagement with a wide range of stakeholders. Involvement of key stakeholders continues as the Scheme is progressed subject to the statutory process. The project team undertakes liaison with the Statutory Environmental Bodies (Natural Resources Wales, Cadw and PCC) and other interested bodies, also consulting with appropriate interest groups and organisations as appropriate. Feedback from the above stakeholders has informed the design process by helping identify risks and suggest measures of mitigation to help shape the development proposed Scheme design.

Wellbeing Way of Working	How the project embeds the ways of working
	<p>The project has also involved others to inform better design. An example is the involvement of the Design Commission for Wales (DCfW) who promote the importance of good design for the built environment across all sectors, including infrastructure.</p> <p>The DCfW reviewed the Scheme in December 2019 and feedback helped inform the ES (see ES Chapter 2). Subsequent reviews were held in February 2020, April 2020, June 2020 and July 2020. The key points raised at these reviews were: consideration of the impact of the Scheme on climate change, consideration of the route options and side road arrangements to provide a sympathetic design, consideration of structural form to ensure consistency along the route (family of structures) and consideration of how the quality of the Scheme is carried through into a D&B contract.</p> <p>ES Chapter 2 sets out consultation at key stages during the development of the Scheme.</p> <p>The project team records any relevant feedback on the consultee aspirations and commitments in an Environmental Management Plan and Register of Commitments, to enable it to be integrated into the design and construction process as environmental design objectives and mitigation measures.</p> <p>As set out in section 3.6, a series of PIEs and public consultation events have been undertaken throughout the project's development and have served to inform the final design.</p>
<p>4. Working with others in a collaborative way to find shared sustainable solutions</p>	<p>The project team through the development of the project has collaborated with Welsh Government and Key Stakeholders to ensure the Scheme delivers as much of a holistic Scheme as possible, examples of this are:</p> <ul style="list-style-type: none"> a) Whilst undertaking the preliminary design the Designer develop a better understanding of the potential environmental impacts which may occur during construction by working with the specialist construction advisor and key stakeholders. As a result, there is a better understanding of the implementation of the mitigation measures during the preparation of the ES. b) Use of specialist, experienced construction advisors to give better understanding of construction issues through all stages of the design. c) Use of expert cost estimating teams and review by Welsh Governments Employers Agent to provide a more accurate assessments of costs, programme and risk.

Wellbeing Way of Working	How the project embeds the ways of working
	<p>d) A risk management strategy has been developed to ensure that all key risks are identified and minimised early within the Scheme development process.</p> <p>e) The temporary working space required outside the permanent land take has been identified and incorporated within the draft Compulsory Purchase Order. This land is included so that the Scheme can be built efficiently and safely, whilst minimising the environmental impacts.</p>
<p>5. Understanding the root causes of issues to prevent them from occurring</p>	<p>A robust approach to problem identification is outlined in section 3.7, taking into account a wide range of traffic, accident and environmental data. The involvement of the Review Group and other stakeholders has also informed problem identification. The identification of scheme objectives (see section 3.8) and the development and design of options (see section 3.9 to 3.11) has responded to the identified problems, helping ensure a long term and sustainable solution.</p>

6 Financial Case

6.1 Overview

- 6.1.1 The Financial Case considers the affordability and long-term financial viability of the option(s). Consideration is given to both capital and annual revenue requirement.
- 6.1.2 This case will need to be updated when a new Design and Build (D&B) Contractor is procured, following completion of Key Stage 4 of the project.
- 6.1.3 An initial Scheme Cost Estimate has been undertaken and is likely to represent a worst case in advance of the appointment of a new D&B Contractor, largely given all of the risk currently sits with the Employer. The initial cost Estimate for the Scheme is likely to be approximately £23,021,469.39. Table 13 shows a summary of the breakdown of the initial Scheme Cost Estimate.
- 6.1.4 The base year prices have also been updated to 2018 prices.

Table 13 Scheme Initial Cost Summary

Component	Estimate
Preparation	£489,920.00
Supervision	£962,180.00
Construction	£20,679,211.26
Land	£890.158.13
Total (excluding VAT and inflation to completion)	£23,021,469.39

- 6.1.5 An adjustment for Optimism Bias (OB) has been included within the indicative costs outlined above. This adjustment reflects the systematic bias for estimated scheme costs to be too low. OB has been calculated using the methodology described in the HM Treasury's Green book and its supplementary Guidance. The OB has been calculated to be 16.58% of the key stage 6 design and construction cost, which equates to £2,571,061.
- 6.1.6 A risk allowance has been incorporated into the cost summary shown in Table 13. This allows for the identified risks as assessed and quantified through a Quantified Risk Assessment. The risk allowance equates to £1,967,516.

- 6.1.7 These costs are assumed on the basis that this Scheme would be delivered separately to the A40 Llanddewi Velfrey to Penblewin Improvements Scheme. The two Schemes are being developed and delivered separately through key stages 3 and 4 with the intention to deliver together as one Scheme during key stage 6. The main advantages/opportunities of delivering construction as one scheme are: optimised project delivery programme, reduced Construction Preliminary Costs and Overhead Costs, optimised design/construction for certain elements for such things as earthworks movements and balancing, consistency in one Contractor delivering all works (no interface).
- 6.1.8 It should be acknowledged that the cost estimate is likely to change with the appointment of a D&B Contractor. At that stage the cost could reduce, should risk be shared, and a result of greater cost certainty and with local market conditions being taken into account.
- 6.1.9 The procurement of the D&B Contractor will include requirements for them to implement Welsh Government Policy as outlined in the following guidance: “Community Benefits: Delivering Maximum Value for the Welsh Pound” and “the Welsh Procurement Policy Statement (WPPS)”. This would maximise opportunities in: Training and Employment; Supply Chain and SMEs; work with local schools and colleges; and contributing to community regeneration. This would be part of the requirements for the D&B Contractor and they will be required to make commitments through the procurement process. Through implementation of this policy it is anticipated that much of the cost could be spent in Wales, of which about half could be spent in the local area.
- 6.1.10 The new trunk road would also have revenue implications in terms of maintenance costs, which would be the responsibility of the Welsh Governments Network Management team. Some of the revenue cost would be covered by a transfer of spend from the existing trunk road, which would be de-trunked and ownership / maintenance responsibility passed to PCC as the local highway authority.
- 6.1.11 The option therefore brings revenue implications for Pembrokeshire through increased maintenance costs associated with the de-trunked section of carriageway which could be in the region of 1km length.

- 6.1.12 Capital costs will be funded jointly, with the allocation of funding being a third Welsh Government and two thirds WEFO. The costs are drawn over the duration of the project with ERDF funding already being claimed to undertake activities such as Ground Investigation.
- 6.1.13 Regarding maintenance, the D&B Contractor, once appointed, will be responsible for maintenance of the Environmental Mitigation for five years post completion (forecast to be 2023 to 2028). Further detail is set out in Section 7 of Volume 2 – of the ECI Contract Works Information, which is assumed to be similar to the contract with the D&B Contractor. The cost will be included in the tender price.
- 6.1.14 The relevant extract of the Works Information is:

7.2 Environmental Aftercare and Management

- 7.2.1 The *Contractor* shall carry out environmental aftercare and management for a period of five years following the completion of the *works*. It shall be undertaken in accordance with the agreed Construction Environmental Management Plan Aftercare (CEMPA) (written in accordance with the requirements of DMRB and associated Procedural Advice and Guidance Notes (PAGs) and IANs.) which will have been submitted to the *Employer* 6 months prior to the end of the construction period.
- 7.2.2 Annual Environmental Performance and Monitoring Report (AEPMR) will be prepared to monitor performance, followed by a Final Environmental Performance and Monitoring Report (FEPMR) at the end of the aftercare period.
- 7.2.3 Six months before the end of the aftercare period the *Contractor* shall update the CEMPA into a suitable Handover Environmental Management Plan (HEMP) written in accordance with the requirements of DMRB and associated Procedural Advice and Guidance Notes (PAGs) and IANs. The HEMP will cover the management of all environmental features (both hard and soft environmental measures).
- 7.2.4 The HEMP will set out the environmental maintenance and management required for the completed project for the next 10 year maintenance period and will be developed in consultation with the *Employer* and their Environmental Representatives of the Managing Agent responsible for the Trunk Road Network.

- 7.2.5 The *Contractor* shall consult with the *Employer* and Managing Agents Environmental Representative to ensure that the HEMP compliments the existing Route Environmental Management Plan (REMP) and is compatible with their current systems.
- 7.2.6 The HEMP will provide indicative costs for the management and maintenance of the environmental measures (including but not limited to, landscape, ecological, water quality and drainage, and noise and vibration measures) for the 10 year period following handover to allow the receiving agent to make reasonable adjustment to their maintenance costs. The HEMP will be submitted to the *Employer* 6 weeks before the issue of the Environmental Aftercare Certificate. The general requirements are set out in Volume 2A Appendix D/3.
- 6.1.15 Regarding defects to the highway, the D&B Contractor will be responsible for rectifying defects within five years after completion, at their own cost if defects are found to be as a fault of design and/or construction.
- 6.1.16 Welsh Government will fund ongoing maintenance of the road via the South Wales Trunk Road Agent (SWTRA). This will include, but not be limited to, structural inspections, highway resurfacing works, winter maintenance, road lighting maintenance and any repair works required as a result of a road collision.
- 6.1.17 PCC will be responsible for similar maintenance on all highways transferred to their ownership as part of the Scheme. The draft Side Roads Order details highways that are to be constructed or modified as part of the Scheme that will be adopted by PCC. The details of any detrunking works of the existing A40 carriageway are yet to be confirmed and it is the intention to have agreed the details prior to the start of Key Stage 6 and would then form part of a de-trunking package between Welsh Government and PCC.
- 6.1.18 The initial cost estimate has a base date of September 2018. The Scheme Cost Estimate would be updated during Key Stage 4 of the project will be in line with this base date.
- 6.1.19 The Scheme is being jointly funded from Welsh Government Infrastructure Delivery Department and the ERDF.
- 6.1.20 Following the acceptance of a Business Case prior to the instruction to proceed with Stages 3 and 4, WEFO have confirmed that ERDF funding

for the Scheme is secured, despite ‘Brexit’ and the UK’s withdrawal from the European Union.

Affordability and risk

- 6.1.21 The Welsh Government has a proven track record of managing and delivering large and complex infrastructure projects. These include projects which have attracted significant contributions from the ERDF. Welsh Government will be responsible for ensuring that WEFO funding is spent as the grant required. WEFO will provide 66.6% for the delivery of the Scheme with Welsh Government funding the remaining 33.3%.
- 6.1.22 WEFO funding is required to be claimed by the end of 2022. The current road opening date is anticipated to be end of 2022. If the road opening date is postponed beyond the end of 2022 there is a risk that the Welsh Government will not be able to claim all the funding available for the Scheme. This could affect the deliverability of the scheme and would require the Welsh Government to fund the remaining outstanding project costs. This risk will be managed through the following stages.
- 6.1.23 The executive management arrangements of the Welsh Government backed up by the professional audit and financial scrutiny mechanisms of central government will help ensure compliance with programme regulations and ensure the associated transparency and propriety of investments sanctioned under the project.
- 6.1.24 The budget will be reassessed by the Employer and this assessment will use the initial Scheme Cost that has been prepared by Arup as a base cost which has been inflated as necessary to take include items such as Contractor risk, Contractor fee percentage, Employer’s risk, Employer’s technical advisor cost, Employer’s cost, land compensation.
- 6.1.25 Finally, As the Scheme is part funded by WEFO, WG only need to source 33% of monies associated with the delivery of Key Stage 6.
- 6.1.26 The requirements of Clause 3.17 of the Works Information Volume 2 and Appendix P Volume 2A will apply during Key Stage 6.

6.1.27 The tenderers will be required to price for risks which they “own” within the Key Stage 6. The relevant extract of the Works Information is:

3.17 Risk Management

- 3.17.1 The *Contractor* shall manage risk on the project in accordance with the procedures set out in the Latest version of the Value for Money Manual – risk Analysis and Management. This shall include the use of graphical presentations of risk drawn down.
- 3.17.2 The *Contractor* shall set up a risk workshop early in Key Stage 3 to review the Risk Register submitted with the tender and update as necessary. The Contractor shall review and update the Risk Register as a minimum every 3 months (or at such shorter times as directed by the *Employer*) during Key Stage 3 & 4 and 1 month during KS6 and carry out/manage the actions identified.
- 3.17.3 The Risk Register will be discussed at each Progress Meeting and include the following:
- (i). A description of the key risks to the Project delivery/cost;
 - (ii). The likely effect/cost of each risk (quantified);
 - (iii). The organisation best placed to remove/manage each risk;
 - (iv). Target dates for action; and,
 - (v). Hazards with implications under the CDM Regulations.
- 3.17.4 At intervals not exceeding 6 months the Technical Advisor shall carry out, a risk identification and assessment exercise and shall report the results of such exercise to the *Employer*. The *Contractor* shall arrange and take part in a Risk Workshop which will include other advisors appointed by the *Employer* where appropriate. The risks identified shall be taken into account in the preparation of cost estimates in a manner to be agreed with the *Employer*.

7 Commercial Case

7.1 Overview

- 7.1.1 The Commercial Case considers whether it will prove possible to procure the scheme and then continue with it into the future. The case considers the level and type of involvement from the private sector, as well as potential effects on the on-going viability of the option/scheme.
- 7.1.2 This case will need to be updated when a new Design and Build (D&B) Contractor is procured, following completion of Key Stage 4 of the project.

7.2 Procurement Strategy

- 7.2.1 The choice of procurement type for the project is based on a number of basic principles applied to achieve best value including:
- a) Selection of Contractors on the basis of quality and price;
 - b) Fair Allocation of Risk;
 - c) Optimising Quality of Design, buildability and Sustainability;
 - d) Adopting a non-contractual Partnering Approach.
- 7.2.2 The A40 Penblewin to Redstone Cross Improvements Key Stages 3 and 4 was instructed by the Welsh Government to be undertaken as an additional element to the A40 Llanddewi Velfrey to Penblewin Improvements.
- 7.2.3 The Welsh Government initially appointed Carillion as the Contractor responsible for construction for the Design Development phase under an Early Contractor Involvement (ECI) form of Contract. Carillion entered liquidation in 2018 and no longer forming part of the project team. This results in a change from the original Early Contractor Involvement (ECI) method of delivery.
- 7.2.4 There are several references within the following sections to the ECI Contract. This is the contract between Welsh Government and Carillion and the contract clauses referenced will carry through into any future D&B contractor procurement.

- 7.2.5 The Welsh Government have decided to follow EU Procurement regulations for the tender of a Design and Build Contract, following successful completion of the Statutory Process (Key Stage 4) of the A40 Llanddewi Velfrey to Penblewin Improvements. The delivery of the Penblewin to Redstone Cross Improvements will be included within the commission for the D&B Contract to deliver. It is the Welsh Governments intention to deliver both projects together.

7.3 Procurement Process

- 7.3.1 The procurement process is in compliance with European Union Procurement Directives¹⁵ and the corresponding UK Public Contract Regulations 2015.

Original ECI Contract 2017 - 2018

- 7.3.2 As explained in WelTAG Stage 2 documents, an OJEU Prior Information Notice (PIN) was first published in TED (Tenders Electronic Daily – Supplement to the Official Journal of the EU) on 22 December 2015, reference 2015/S 247-44880816. The scope of works outlined in the PIN included: developing the outline design, preparing the necessary statutory orders and EIA documentation, publishing draft Orders (Key Stage 3), progressing the project through the statutory process including Public Inquiry if required (Key Stage 4) and, if successful, then undertaking detailed design, construction and after-care of the project (Key Stage 6).
- 7.3.3 In the PIN, the value of Orders was estimated at around £30,000,000 and the total scheme costs circa £50,000,000 excluding VAT.
- 7.3.4 An OJEU Contract Notice was published on the Welsh Government's Sell2Wales¹⁷ website on 25th March 2016, reference 2016/S 061-102869. The contract value was estimated at £55,000,000 – £65,000,000.

¹⁵ Directive 2004/18/EC

¹⁶ <http://ted.europa.eu/udl?uri=TED:NOTICE:448808-2015:TEXT:EN:HTML>

¹⁷ Sell2Wales is the procurement portal set up by the Welsh Government

- 7.3.5 Those who successfully completed the PQQ were then invited to tender in June 2016, in accordance with the *‘ECI Design and Build Contract – Volume 0, Instructions for Tenderers’*. These instructions provided guidance to tenderers on the form and assessment of tenders relating to the contract for the design development of the A40 Llanddewi Velfrey to Penblewin improvement project and the provision of assistance with the statutory procedures.
- 7.3.6 The Contract Notice stated that contract award would be based on the most economically advantageous tender *in terms of the criteria stated in the specifications, in the invitation to tender or to negotiate or in the descriptive document*. Detailed tender evaluation criteria were set out in the *‘ECI Design and Build Contract – Volume 0, Instructions for Tenderers’* covering quality and price.
- 7.3.7 The final tender assessment was based on a weighting of the Quality and Financial submissions in the ratio 50:50 respectively.
- 7.3.8 The contract was awarded on 3rd February 2017 to Carillion, with engineering and environmental design provided by Arup and RML.
- 7.3.9 In addition to the above process, Welsh Government also procured the provision of support (Employer's Agent) through a management consultancy works and services contract. An OJEU contract notice for this was published on 6th June 2015, reference 2015/S 108-196566¹⁸.
- 7.3.10 The procurement process was an open procedure with an estimated contract value of £1,500,000 excluding VAT. The contract award was based on the most economically advantageous tender in terms of:
- a) Project team and management (14%)
 - b) Project delivery - Technical (17%)
 - c) Project delivery - Commercial (25%)
 - d) Resources and programme (14%)
 - e) Cost. Weighting (30%)

¹⁸ <http://ted.europa.eu/udl?uri=TED:NOTICE:196566-2015:TEXT:EN:HTML>

- 7.3.11 The contract award decision was made on the 9th October 2015 with three offers having been received and evaluated. Arcadis (and Technical Advisor Mott Macdonald) were awarded the contract of Employer's Agent for the project, with a total final value of contract of £1,342,461.13, excluding VAT. A contract award notice was published on 6th November 2015, reference 2015/S 215-392974.

Key Stage 3 and 4 Development

- 7.3.12 Following the liquidation of Carillion, revised contractual arrangements were made and implemented by the Welsh Government.
- 7.3.13 Arcadis (and Technical Advisor Mott Macdonald) continued their contract of Employer's Agent for the project.
- 7.3.14 Arup (supported by sub-contractor RML) were directly appointed to the Welsh Government to continue the development of Key Stage 3 and to support the Welsh Government through the Statutory Process (Key Stage 4).

Key Stage 5 Procurement of a D&B Contractor

- 7.3.15 The Welsh Government will be required to follow EU Procurement regulations for the tender of a Design and Build Contract. The procurement strategy adopted would follow the OJEU Restricted process as outlined in 6.

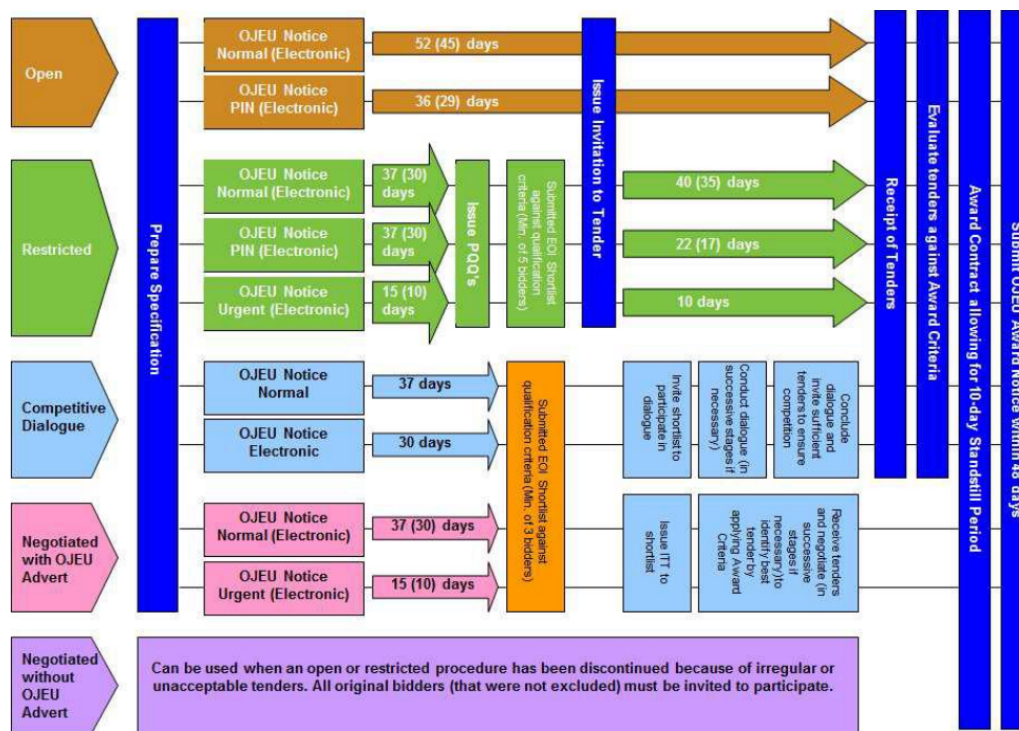


Figure 6 OJEU Process

- 7.3.16 The Welsh Government will conduct a PQQ process before undertaking a full Design and Build tender. The tender will likely span over 3 months / 12 weeks to enable the tenderers to sufficiently develop their design to be able to inform their tendered estimate of the overall price.
- 7.3.17 It is the Welsh Government's intention is to deliver the A40 Llanddewi Velfrey to Penblewin Improvements and the Penblewin to Redstone Cross Improvements as one Scheme. The Llanddewi Velfrey to Penblewin Improvements is approximately one year ahead of the Penblewin to Redstone Cross Improvements. Therefore, the procurement of the D&B Contractor will run in parallel with the Key Stage 4 of the Penblewin to Redstone Cross Improvements.
- 7.3.18 As per the previous ECI tender process, the evaluation of the tender will be based upon a quality submission and a financial submission. The ratio of Quality and Financial will be determined in due course but is likely to be similar to the original ECI tender, which was 50:50 Quality:Financial. There is the potential for the weightings to be amended to more heavily favour the quality or financial, but this has not been determined yet.
- 7.3.19 The arrangements moving forward into the conduction stage would

likely be:

- a) Employers Agent – Arcadis;
- b) Technical Advisor to Employers Agent – Mott MacDonald;
- c) Design and Build Contractor – To Be Confirmed via procurement. Likely to be sole entity but could be a joint venture; and
- d) Design and Build Contractor's Designer – To Be Confirmed via procurement. Likely to be sole entity but could be a shared appointment between Engineering Design and Environmental Design.

7.4 Contract length

7.4.1 The anticipated contract timescales for the D&B Contract are outlined below:

- a) contract start is early 2021;
- b) start on site for construction is Spring 2021 (for Llanddewi Velfrey to Penblewin Improvements) with start on Redstone Cross to Penblewin Improvements in early 2022;
- c) completion on site is Late 2022 / Early 2023; and
- d) end of the aftercare period is 2028.

7.4.2 The anticipated duration is up to seven years.

7.5 Specification of required outputs

7.5.1 The specification of outputs are included within the relevant Contracts as outlined below

7.5.2 Key Stage 6 deliverables are listed in detail in the original *ECI Design and Build Contract Volume 2 Works Information* as tendered. Further detailed is provided in the subsequent sections of Chapter 6: Requirements for Key Stage 6. The relevant extract of the Works Information is:

6 REQUIREMENTS FOR KEY STAGE 6

6.1 Key Stage 6 Programme Requirements

6.1.1 The table below contains the *Employer's* programme requirements for Key Stage 6. It identifies the main submission events and the number of weeks after Contract Award when they are expected.

TABLE 6.1 Key stage 6 Event Programme:

Event	Time required
Commence Detailed Design	On <i>Employer's</i> instruction
Submission of Key Stage 6 programme	2 weeks after commencement of Key Stage 6
Submission of <i>Statutory Authorities'</i> Works Report	4 weeks after commencement of KS6
Placing orders for <i>Statutory Authorities'</i> diversion works	In accordance with <i>Contractor's</i> programme
Submission of Construction Quality Plan	4 weeks prior to start on site
Submission of Health and Safety Plan	4 weeks prior to start on site
CEMP (update of draft CEMP)	4 weeks prior to start on site
<i>Contractor's</i> Key Stage 6 Design submission including updated SU Works Report	3 weeks prior to start on site
Submission of Stage 2 Road Safety Audit	In accordance with <i>Contractor's</i> programme following completion of the detailed design
Licences and Consent applications	In accordance with <i>Contractor's</i> programme
Construction start on site	To be determined by <i>Contractor</i>
Submission of Stage 3 Road Safety Audit	3 weeks (min) prior to road opening
Road Opening	To be arranged
Completion of KS6 construction works	By May 2020
Health and Safety File (including all 'as built' and manuals etc.)	At time of certification of Completion by the <i>Project Manager</i> .

6.1.2 Key Stage 6 activities shall commence with the start of detailed design. The *Employer* may instruct the *Contractor* to commence detailed design in advance of the end of the High Court Challenge Period but this is entirely at the discretion of the *Employer*.

7.5.3 Key Stage 6 detailed design will be based upon Key Stage 3 and 4 design submissions. The Key Stage 6 Detailed Design submission will be sufficiently detailed to demonstrate compliance with the relevant codes and standards to enable the works to be constructed in accordance with the contract requirements and specification.

7.6 Allocation of risk

- 7.6.1 The allocation of Key Stage 6 risk is likely to be similar to that originally covered by clause Z.9 of the Engineering and Construction Contract (ECC) for Early Contractor Involvement (ECI) Design and Build Contract Volume 1h.
- 7.6.2 The Project Risk Register, as discussed in Section 5.8, outlines foreseeable project risks, which include risks that will be allocated to the D&B Contractor. The Project Risk Register quantifies the likely cost if the risk becomes an eventuality. This Risk Register has been assessed to inform a Risk allowance and has been incorporated into the Scheme Budget. Section 5.8 provides a summary of several of the top risks included within the Project Risk Register.
- 7.6.3 Whilst the future allocation of risk involving the D&B Contractor (once appointed) has not been determined yet, at this point in time it is not unreasonable to assume that the risk allocation, and therefore Compensation Event clauses which will be removed, will be similar or identical to the ECI contract. For clarity, at ECI stage the Contractor took the key risks of:
- a) 60.1(12) – Physical Conditions;
 - b) 60.1(13) – Weather; and
 - c) 60.1(19) – Force majeure.

7.7 Contractual agreements

- 7.7.1 The key Contractual arrangements are set out in the following section.
- 7.7.2 **Key Stage 6**
- 7.7.3 For Key Stage 6, outline contractual arrangements are not currently available. The contract is likely to take the form of either NEC3 ECC or NEC4 contract with the option to be determined in due course.
- 7.7.4 The option choice is likely to be between Option A (Fixed Price) or Option C (Target Price).
- 7.7.5 Under the original ECI contract, the payment process was the PSC Main Option C (Target Contract), amended slightly in accordance with Volume 1e Clause Z.5. For Key Stage 4, the payment process was the

PSC Main Option E (Time Based Contract), amended slightly in accordance with Volume 1f Clause Z.5.

7.7.6 For Key Stage 6, the payment mechanism will be defined by the contract chosen. The payment assessment period will be monthly.

8 Next Steps

8.1 Whether or not to proceed to implementation

- 8.1.1 The Review Group has met during Stage 3 to review the appraisal of the preferred option. Taking into account the Stage 3 appraisal and the results of the technical assessments as set out within this report, the Review Group has agreed that sufficient evidence has been presented to demonstrate that the preferred option best addresses the identified problems and best achieves the objectives, as well as contribute to the well-being of future generations. It could be delivered within technical and financial constraints. As such, it is selected as the preferred option for procurement.
- 8.1.2 Following publication of the draft Orders, there is an opportunity for any individual or organisation to support, comment or object to the draft Orders, put forward alternative proposals, or comment on the ES.
- 8.1.3 The Welsh Government will consider all of the responses to the draft Orders and then decide whether to hold a Public Local Inquiry. Such Inquiries are held before an independent Inspector who would hear and consider the evidence both for and against the published Scheme and subsequently report the findings and recommendations to the responsible Welsh Ministers.
- 8.1.4 The Welsh Ministers would consider all issues before deciding whether to proceed with the Scheme and, if so, make the Orders with or without modification.

8.2 WelTAG Stages 4 and 5

- 8.2.1 Should the Welsh Ministers decide to proceed with the Scheme, then at the next stage of the WelTAG process, Stage 4 is to record what is actually delivered, the wider content at the time at which the scheme is delivered and to record the impacts that actually occur during implementation. That aims to allow for an immediate alert if there are any unintended adverse impacts during implementation and can assist in the realisation of any benefits. It also acts as a record of what is actually delivered, which is required in the Stage 5 evaluation work.

- 8.2.2 The aim of Stages 4 and 5 is to record what happens so that lessons can be learnt. It may lead to alterations to the current scheme and will form valuable evidence for use in future WelTAG appraisals.
- 8.2.3 Records should be kept of the impacts during implementation as these will be required to evaluate both the process of implementation and the outcomes. External events which could affect the evaluation should be recorded as they occur, such as adverse weather events, changes in legislation, the outcomes regarding key risks identified at Stage 3 and any changes made to the scheme during implementation.
- 8.2.4 The monitoring and evaluation plan (see section 5.12) describes the methods that will be used to provide the evidence required during and post-implementation. No required 'before' studies have been identified given the detailed level of survey and assessment undertaken at Stage 3. If there is an unforeseen lengthy delay between this Stage 3 report and implementation, the Welsh Government should consider updating its evidence base as appropriate.
- 8.2.5 If the observed impacts differ from the anticipated impacts then an interim Stage 4 report should be produced to record this, and to offer ways of maximising any unintended benefits or to mitigate any unintended adverse impacts. The final Stage 4 report will record an immediate post opening evaluation recording the actual outputs delivered and the initial impacts. This should cover the first six months of operation and be completed within 12 months' post opening or completing of the intervention.
- 8.2.6 Then at Stage 5 the Welsh Government should produce a record of what was delivered, an evaluation of the process of delivering the option, a record of the actual impacts compared to the anticipated impacts and an assessment into the extent to which it met the original objectives.

Appendix A

WelTAG Stage 1 and 2 Study Report

Appendix B

General Arrangement Drawing

Appendix C

WebTAG Appraisal Summary Table