South Wales Trunk Road Agent

Managing and Improving Motorways and Trunk Roads through South Wales

Asiant Cefnffyrdd De Cymru

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

M4 Junction 48 and A4138

WelTAG Four / Five Report

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

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M4 Junction 48 and A4138

WelTAG Stage Four / Five Report

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1. Introduction

1.1. Background

The A4138 is recognised as a key transport corridor within South West Wales for both Carmarthenshire County Council (CCC) as the local highway authority and WG / SWTRA as the strategic highway authority; with the road connecting Pontarddulais with Llanelli via J48 of the M4. The section of the A4138 known as Pontarddulais Road is approximately 1km in length and extends from M4 J48 to the A4138 / Pontarddulais Road (B4297) Traffic Signals at Talyclun.

Atkins were commissioned to undertake a WelTAG Stage One to Three appraisal of potential improvement options at M4 J48 and A4138 Pontarddulais Road using WelTAG 2017 guidance. WelTAG is an appraisal framework that covers the lifecycle of a potential intervention in the transport system, from an original assessment of the issues through to implementation and evaluation of a scheme. The WelTAG process is separated into five stages, which are presented in **Figure 1-1**.

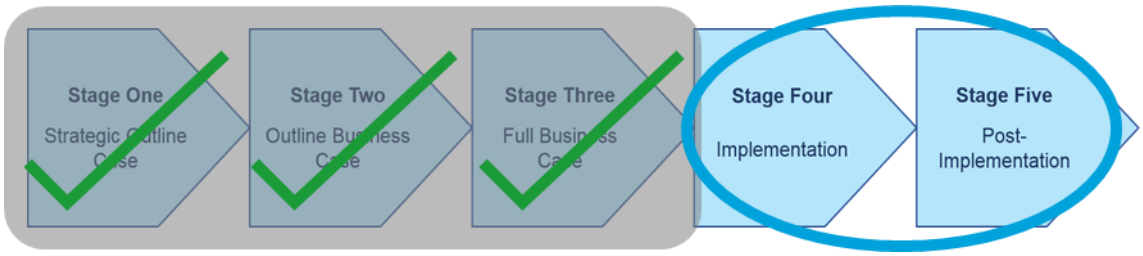


Figure 1-1 *Overview of WelTAG Process, and purpose of this report*

The WelTAG Stage One and Two report established the existing and potential future transport problems, before developing and appraising a range of potential transport interventions at the M4 J48 and A4138 Pontarddulais Road.

There were several issues related to driver behaviour and to the configuration of the A4138 and M4 J48 that were considered to contribute to the transport problems experienced. In addition, several opportunities were also identified, as summarised in **Figure 1-2**.

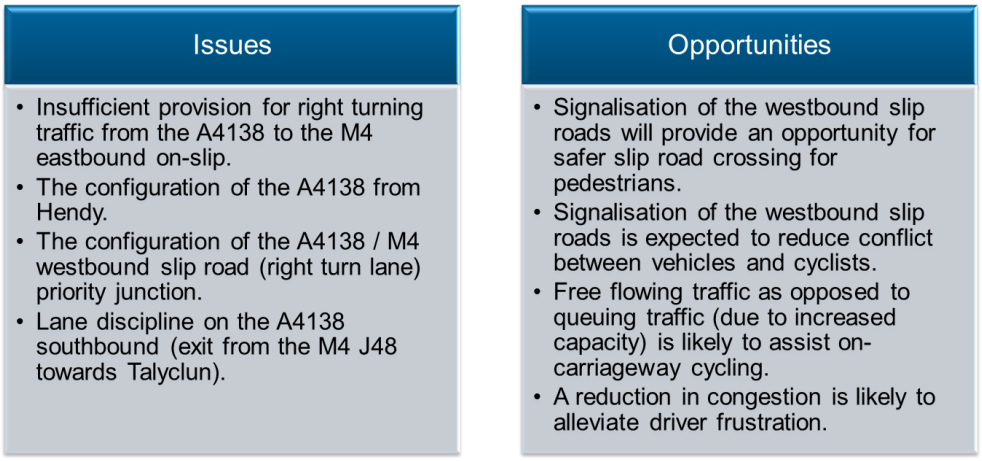


Figure 1-2 *Issues and Opportunities identified at WelTAG Stages One to Three*

Following confirmation of the key study area issues / constraints and development of the transport planning objectives, the following improvement options were identified.

- **Option 1, 1a & 1b**: to reduce queueing along the A4138 approaches to M4 J48;
- **Option 2 & 2a**: to reduce queueing along the M4 Westbound Off-Slip (right turn lane);
- **Option 3, 3a, 3b & 3c**: to further reduce queueing on the A4138 southbound from Hendy; and
- **Option 4, 4a, 4b & 4c**: to reduce the queueing on the M4 eastbound Off-Slip (right turn lane).

The scheme ranking process indicated that **Option 2a** was the preferred option, which was fully developed as part of the WelTAG Stage Three process.

1.2. Purpose of this Report

The purpose of this report is to present the findings of a monitoring exercise undertaken on the completed scheme, to determine whether the beneficial impacts expected from the scheme are being realised. This report serves as a combined WelTAG Stage Four / Five report, as outlined in Figure 1-1. Whilst it is acknowledged that there is a consultation draft update to WelTAG (2022), this document has been prepared in accordance with the guidance currently adopted; WelTAG 2017.

The aim of WelTAG Stages Four and Five is to record and monitor schemes post-implementation to learn lessons and determine whether the schemes deliver what they are expected to. This may lead to alterations to the current scheme and will form evidence for use in future WelTAG appraisals.

More specifically, the purpose of Stage Four is to record what is actually delivered, the wider context at the time at which the scheme is delivered, and to record the impacts that actually occur during implementation. This allows for an immediate alert if there are any unintended adverse impacts during implementation. The purpose of Stage Five is to compare the observed impacts of the scheme against the anticipated impacts.

This WelTAG Stage Four and Five study has been developed with a level of detail proportionate to the scale and significance of the potential impacts and risks associated with the proposed scheme. Where impacts of the delivered scheme have been appraised, reference has been made to the seven-point scale prescribed within WelTAG, summarised in **Table 1-1**.

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

Table 1-1 *WelTAG Seven-Point Appraisal Scale*

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

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

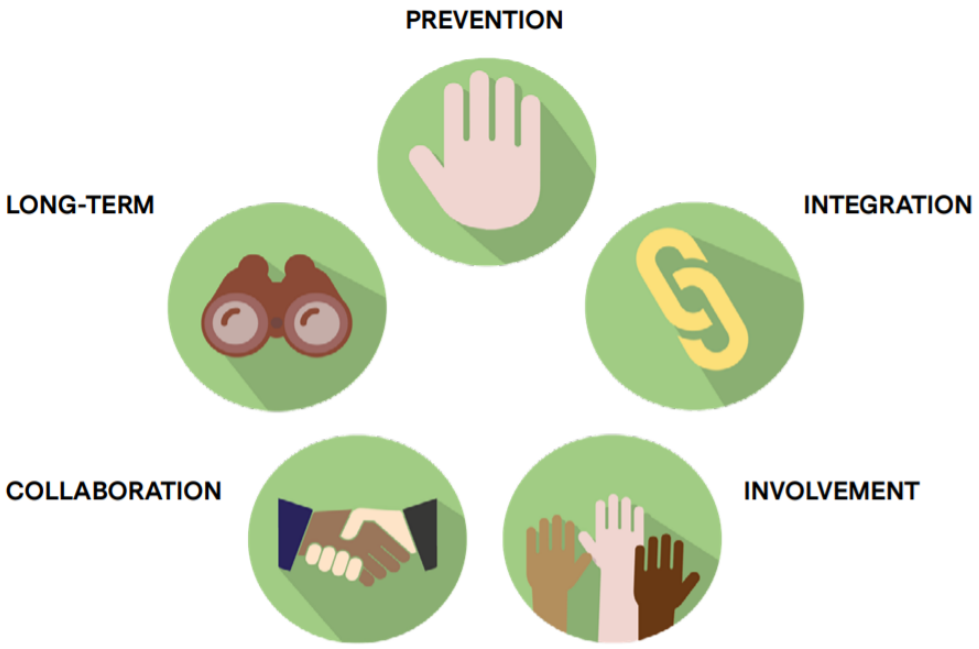


Figure 1-3 *Well-being of Future Generations (Wales) Act – Five Ways of Working*

This WelTAG Stage Four / Five report has considered the five-ways of working throughout the development of the study, with a programme of stakeholder engagement forming one of the key evidence points in assessing the success of the scheme.

Whilst COVID-19 impacted transport trends during the period of construction, at the time of the traffic surveys obtained for this report government restrictions had been fully lifted, and therefore are considered to capture travel patterns that are reflective of the current 'normal'. It is acknowledged however that patterns may continue to change as people's working patterns continue to adjust to restrictions being lifted.

2. Strategic Case

2.1. Introduction

The case for change at M4 Junction 48 and A4138 was established as part of the WelTAG Stages One to Three studies; this chapter presents an overview of the strategic context within which this WelTAG Stage Four / Five is being undertaken and considers the alignment of the constructed scheme with current strategy.

2.2. Policy Context

The delivered scheme was considered to be in line with policy as it had the potential to improve the efficiency and safety of travel in the area for both vehicle users and active travel users. Since the completion of the WelTAG Stage Three study, Welsh Government released the new Wales Transport Strategy (Llwybr Newydd: the Wales Transport Strategy 2021). The following policy documents are considered of relevance to this WelTAG Stage Four / Five document:

- National:
  - Planning Policy Wales;
  - Llwybr Newydd: the Wales Transport Strategy
  - Technical Advice Note 18: Transport;
  - National Transport Finance Plan;
  - Prosperity for All: Economic Action Plan;
  - Active Travel (Wales) Act; and
  - Well-being of Future Generations (Wales) Act.
- Regional and Local Policy:
  - Carmarthenshire County Council: Moving Forward in Carmathenshire, the next 5 years;
  - Carmarthenshire County Council: Carmarthenshire Local Development Plan.

The Wales Transport Strategy (WTS) sets out Welsh Government's vision for an accessible, sustainable and efficient transport system, which can contribute to a more prosperous, green and equal society.

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

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

The WTS sets out three short-term key priorities and four longer-term well-being ambitions for the transport system in Wales. The priorities and ambitions

of the WTS have been developed with reference to the Sustainable Transport Hierarchy illustrated in **Figure 2-1**.

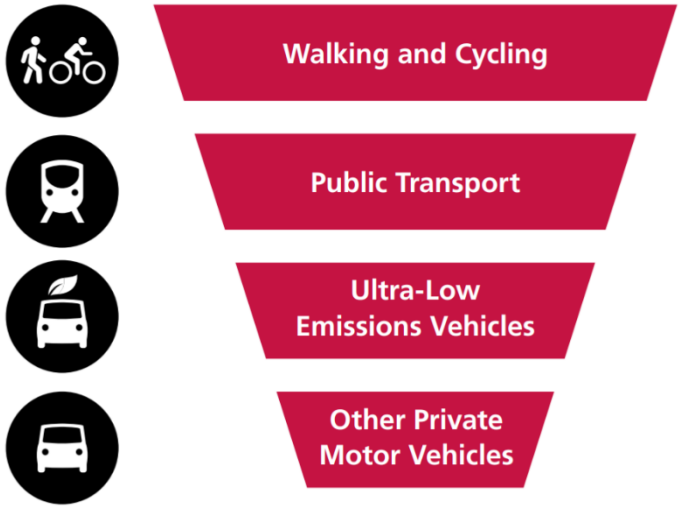


Figure 2-1 *Sustainable Transport Hierarchy – Wales Transport Strategy 2021*

Current policy emphasises the importance of considering all road users in the development of transport schemes; noting the Sustainable Transport Hierarchy.

CCC's plan for highways and transport highlights the importance of the County's highways infrastructure for the movement of people and goods throughout the region, and its importance in supporting regeneration. It also states that in addition to the management of existing services it plans to establish Carmarthenshire as the cycling capital of Wales with several cycle infrastructure projects. This is considered relevant to this report, due to the alignment of the delivered scheme, and specifically the high quality shared-use path, with the plan. The plan also refers to working with the Welsh Government to develop the County's highways infrastructure in order to improve air quality. The delivered scheme at M4 J48 is considered to be a good example of CCC and Welsh Government working collaboratively on a scheme, in line with the fiver-ways of working.

2.3. Transport Context

2.3.1. Junction Layout – Pre-Scheme

The M4 Junction 48 links the motorway to the single carriageway A4138 via east and westbound entry and exit slip roads; an overview of the layout presented in **Figure 2-2**.

Figure 2-2 *M4 J48 / A4138*

The key elements of the junction are summarised as:

- **M4 Mainline** – two lane motorway with hard shoulder;
- **M4 J48 WB Exit** – two lane exit slip road with nearside lane directly feeding onto A4138 southbound via a dedicated lane. Offside lane leads to a give way junction with the A4138 for northbound vehicles, presented in **Figure 2-3.**

Figure 2-3 *View of M4 J48 WB exit intersection with the A4138*

- **M4 J48 WB Entry –** two lane entry slip road with give way priority junction at southern extent where vehicles leaving the NB A4138 had priority over those joining the M4 from the SB A4138,
- **M4 J48 EB Exit –** two lane exit slip road with nearside lane linking to A4138 northbound and offside lane to A4138 southbound, both via a signal controlled junction, presented in **Figure 2-4.**

Figure 2-4 *View of M4 J48 EB exit intersection with A4138*

- **M4 J48 EB Entry** – two lane entry slip road with give way priority junction at northern extent where vehicles leaving the NB A4138 had priority over those joining the M4 from the SB A4138 via a signal controlled junction, and
- **A4138** – three lane single carriageway with two southbound and one northbound lanes.

2.3.2. Active Travel - Pre-Scheme

An existing footway was present at the site running adjacent to the northbound lane of the A4138 providing a link between the areas of Hendy and Pontarddulais, as shown in **Figure 2-5**.

Figure 2-5 *View south of footway prior to construction*

Immediately to the south of the M4 J48 / A4138 site, a shared use path commenced and extends to Llanelli town centre and the adjacent coastal path.

Whilst no dedicated active travel surveys were undertaken prior to the construction work proceeding, the WelTAG combined Stage One and Two report references very limited numbers being noted in the vicinity of the site during site visits, although numbers were noted to increase at the northern and southern extents in the vicinity of the residential areas of Hendy and Llangennech. It is noted that on road cyclist numbers were however recorded as part of the traffic survey undertaken prior to construction.

2.4. Transport Objectives

The transport problems are set-out in **Figure 1-2**, and these informed the development of transport objectives during the WelTAG Stage One to Stage Three process. The transport objectives developed prior to the construction of the scheme are presented in **Figure 2-6**.

Reference	Overarching Objective	Sub-objectives
TPO1	Improve connection from M4 to the A4138	• Enhance accessibility to Llanelli; • Enhance accessibility to Hendy; and • Improve safety for all modes of transport (i.e. vehicular / non-motorised).
TPO2	Improve connection from the A4138 to the M4	• Enhance accessibility from Llanelli; • Enhance accessibility from Hendy; and • Improve safety for all modes of transport (i.e. vehicular / non-motorised)
TPO3	Ensure slip-road queueing does not extend onto the M4 mainline	• M4 westbound off-slip; and • M4 eastbound off-slip.
TPO4	Improve peak period journey times on the A4138 from Hendy / M4 to the Talyclun signals	• Actual journey times and journey time reliability; • Reduce queueing; and • Improve A4138 southbound lane discipline / merge
TPO5	Improve journey times on the A4138 from Talyclun signals and Hendy / M4	• Actual journey times and journey time reliability; and • Reduce queueing.
TPO6	To contribute to CCC's Active Travel (Wales) Act 2013 Goals	• To contribute is CCC's 15-year vision to improve cycling and walking routes across the county; and • To contribute to the long-term ambition for Carmarthenshire to become the cycling hub of Wales

Figure 2-6 *M4 J48 transport objectives – WelTAG Stages One to Three*

2.5. Delivered Scheme

The delivered scheme broadly includes:

- Shared-use path providing north-south connectivity, with associated toucan crossing points across west facing slips;
- Removal of central reservation under the M4 overbridge, replaced by a right turn lane for traffic travelling from the A4138 to the M4 eastbound on-slip;
- Removal of the give way line on the eastbound on-slip, replaced by the nearside lane being a dedicated lane for Hendy traffic. It is intended that all other slip road traffic utilise the offside lane; and
- Signalisation of the M4 westbound off-slip right-turn lane and the right-turn from the A4138 southbound to the M4 westbound on-slip.

Construction of the scheme was planned so as to minimise disruption to the travelling public with tender stipulations including that the successful contractor was required to maintain the existing number of running lanes during daytime hours through the construction phase.

Statutory utility companies were consulted through the design phase with localised diversions undertaken prior to commencement of the Principal Contractor to reduce the risk on conflict however additional requirements regarding working methodologies were stated by Dwr Cymru Welsh Water (DCWW) following commencement of work which resulted in some delay and drainage redesign being required.

Construction of the proposed scheme was completed between April and December 2021 by Walters UK Ltd as Principal Contractor.

The as-built drawing is illustrated in **Figure 2-7**.

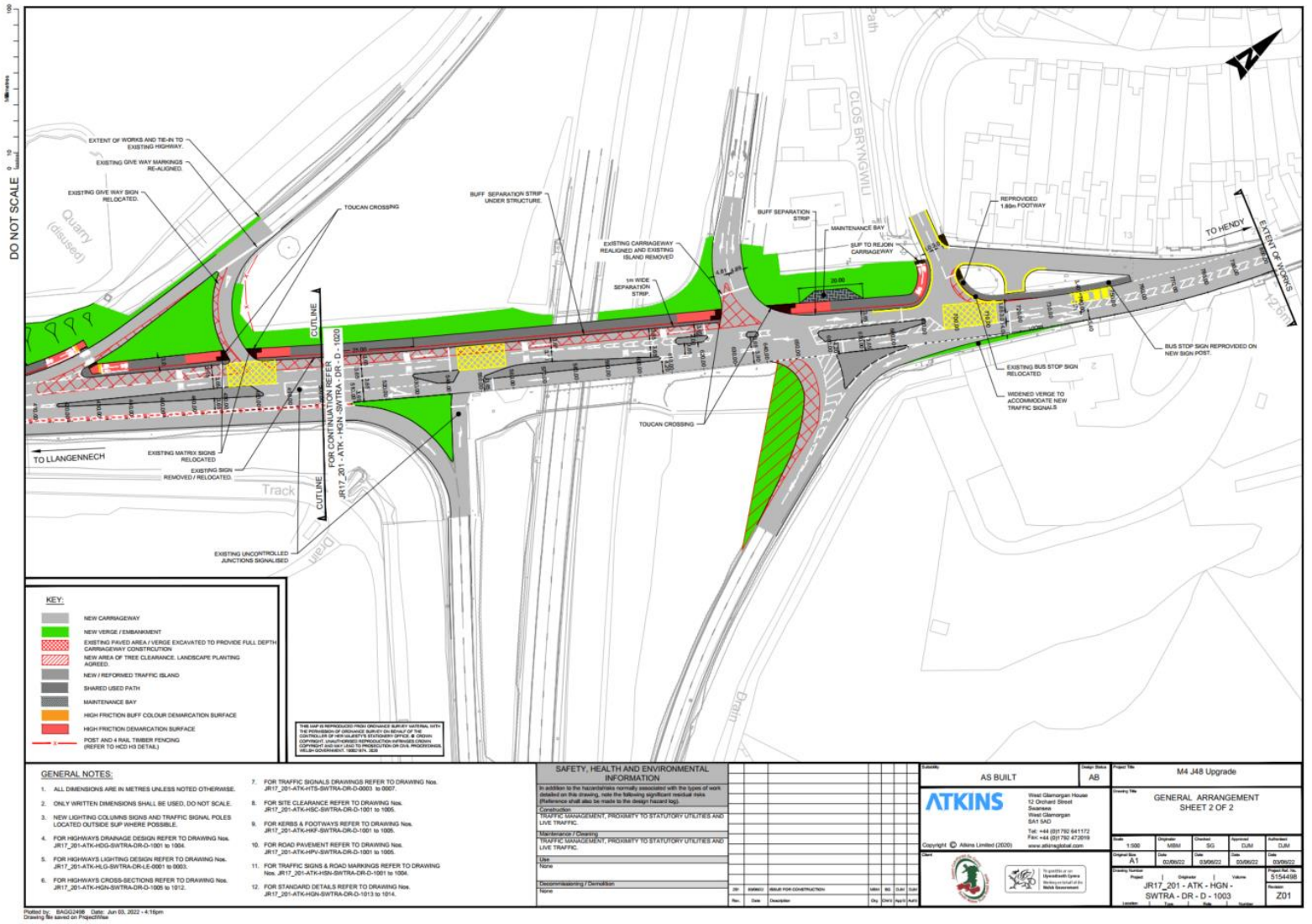


Figure 2-7 *Delivered Scheme – Construction Drawing*

3. Transport Case

3.1. Overview

The Transport Case at WelTAG Stage Three reviewed what the expected impacts of the scheme would be, and how well the scheme contributes to the well-being goals of the Future Generations (Wales) Act.

It was considered at WelTAG Stage Two and three that Option 2a (now the delivered scheme) would contribute to achieving all transport objectives, with the proposed scheme expected to reduce queueing on the A4138 and the M4 off-slips, to improve connections between the two roads and ensure that queueing does not extend onto the M4 mainline. It was also expected to contribute to CCC's active travel goals, by providing a key connection with the existing shred-use path along the A4138 into Llanelli.

3.2. Evaluation of Delivered Scheme

As referred in WelTAG, a logic map has been prepared to assist in the monitoring and evaluation of the scheme, as presented in **Figure 3-1**. Note that the transport problems included within the logic map are those identified in the early WelTAG stages that are relevant to the delivered scheme. The logic map includes details on

- Context – The transport problem that forms the rationale for delivering the proposed scheme
- Input – the element of the proposed scheme that addresses the transport problems;
- Output – how the proposed scheme is intended to change the transport conditions within the local area; and
- Outcome – the Well-being goals impacted by the output of the proposed scheme.

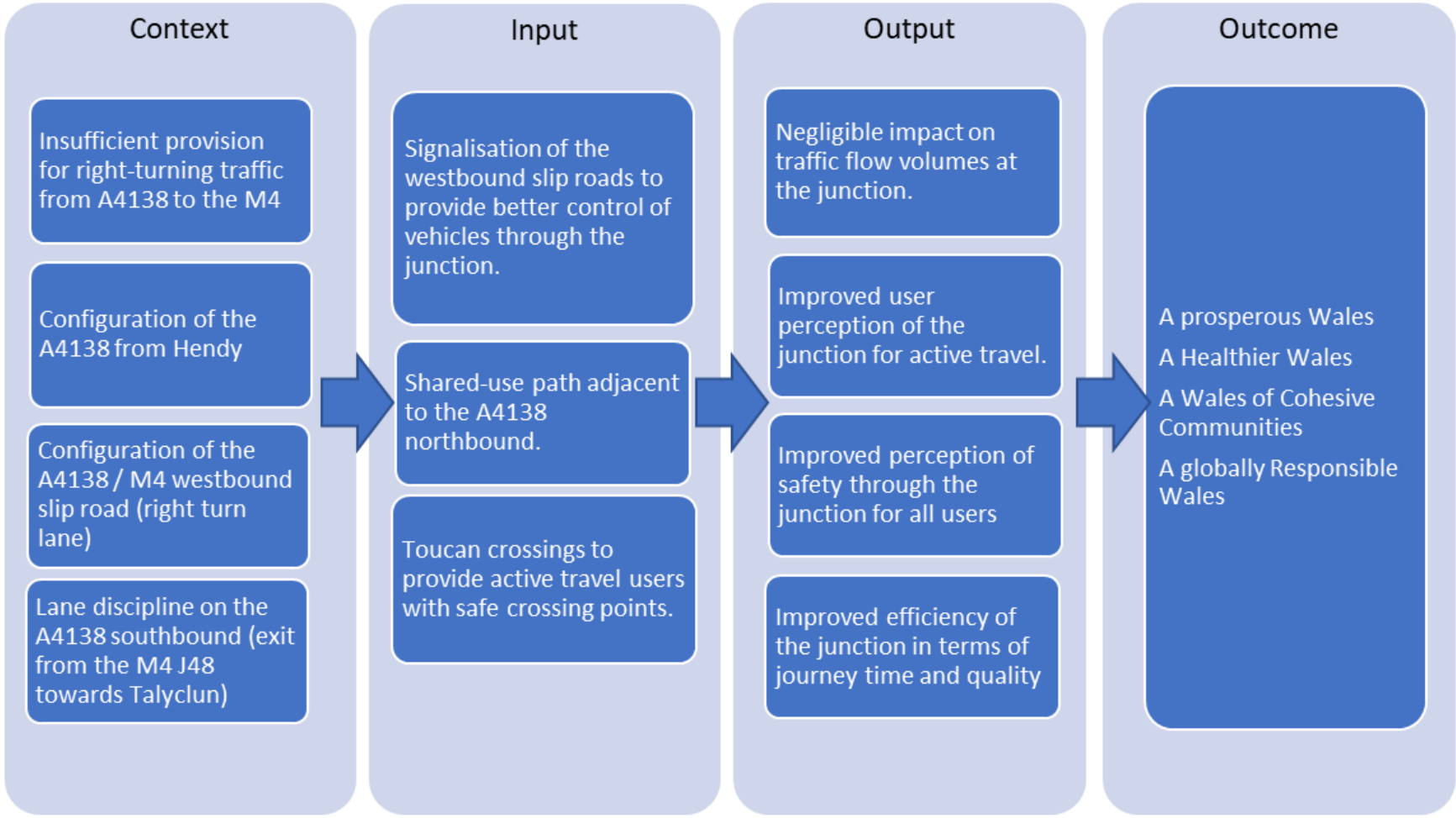


Figure 3-1 *Scheme Evaluation Logic Map*

3.3. Monitoring and Evaluation Plan

In line with WelTAG, an outline monitoring and evaluation plan was set out at WelTAG Stage Three, as shown in **Table 3-1.** The evaluation of the delivered scheme has been undertaken in accordance with the monitoring and evaluation plan, and the remainder of this section is structured in line with the identified monitoring headlines.

Headline	Description	Indicative Targets	Potential Data Sources	Potential Mitigation Actions	Potential Well-being Goals Impacted
Queueing	A potential effect of the intervention is a change in queueing, particularly on the M4 J48 westbound exit due to the introduction of an additional set of traffic signals.	Reduced queue lengths on the M4 J48 off-slip during pm peak compared to pre-construction situation	Queue length surveys	If increased queueing is recorded in the nearside lane, further consultation could be undertaken with CCC in relation to the A4138/Pontarddulais Road junction signals to establish if their operation is currently optimized. If increased queueing is recorded in the offside lane, a review of the new traffic signal timings could be undertaken.	A Prosperous Wales A Healthier Wales A Wales of Cohesive Communities
Traffic Flows	The intervention is not anticipated to have a significant affect on junction turning counts due to the limited alternative routes.	No significant change in the turning movements at the junction	Manual Classified Surveys	If a significant change in turning movements is recorded a review of the signal timings at the junction could be completed to ensure one approach isn't being prioritised over others.	A Prosperous Wales A Healthier Wales A Wales of Cohesive Communities
Active travel usage	A key part of the scheme is to provide a missing link of shared-use path which will link Hendy to the existing Llangennech to Llanelli route enabling active travel users access to both the town central and the coastal path.	Increased number of cyclists passing through the junction.	Manual Classified Surveys	If no increase in numbers has been documented, user surveys could be undertaken both at the site and on the wider network to establish the reasons for use/lack of use	A More Equal Wales A Healthier Wales A Wales of Cohesive Communities
User Perception	In accordance with the five-ways of working and the intentions of the Future-Generations Act the perception of the scheme from key stakeholders is considered an important metric. It is therefore be considered appropriate to understand the perceived impact of the delivered scheme to provide a measure of satisfaction and improvement since implementation.	Majority agree that the delivered scheme provides an improvement to the junction.	Stakeholder Engagement (questionnaires).	If it is identified that pedestrians and vehicle users are not content with the delivered scheme, further measures could be investigated to improve the suitability of the provision.	A More Equal Wales A Healthier Wales A Wales of Cohesive Communities
Collisions	The proposed intervention includes the introduction of traffic signals at the M4 J48 WB off-slip and Tal-Y-Coed junctions as well as the introduction of controlled pedestrian crossing, hence there could be a an increased risk of collisions as users become familiar with the slight layout amendments..	No increase in the number of collisions along the section of the transport network and zero occurrences of pedestrian collisions.	Collision data.	The traffic signal timings could be reviewed if a significant increase in collisions is recorded.	A Prosperous Wales A Healthier Wales A Wales of Cohesive Communities
Journey Times	The proposed scheme is intended to improve journey efficiency through the junction, so there should be better journey times during the typical peak hours.	Improved peak hour journey times	GPS monitoring (Inrix)	If journey times significantly increase post-implementation, amendments to the signal timings could be considered.	A Prosperous Wales A Wales of Cohesive Communities
Speeds	The proposed intervention includes the introduction of additional traffic signals and a 30mph speed limit through the M4 J48 / A4138 junction. A review of speeds could therefore demonstrate compliance with the new speed limit.	85th percentile speeds under the 30-mph speed limit.	Speed surveys, Trafficmaster or TomTom data.	If speed limit compliance is low, additional measures to enforce and sign the new 30-mph zone could be investigated.	A Prosperous Wales A Healthier Wales
Air Quality	Whilst no carbon or air quality assessment was undertaken prior to construction of the scheme the new Wales Transport Strategy places importance on a reduction in vehicle emissions, which can be achieved through a reduction in vehicle numbers, but also a more efficient vehicle flow.	Improved vehicle flow through the junction to improve air quality.	Qualitative assessment based on journey time and queue length information	If an increase in journey time and / or queue lengths are observed, indicating congestion and subsequent negative impacts on air quality, amendments to signal timings could be considered.	A Prosperous Wales A Healthier Wales A Globally Responsible Wales

Table 3-1 *Monitoring and Evaluation Plan*

3.3.1. Queueing

Queue length surveys have been undertaken since the delivered scheme has been completed, during the August and December 2022. A comparison of the average queue on key movements is resented in **Figure 3-2.**

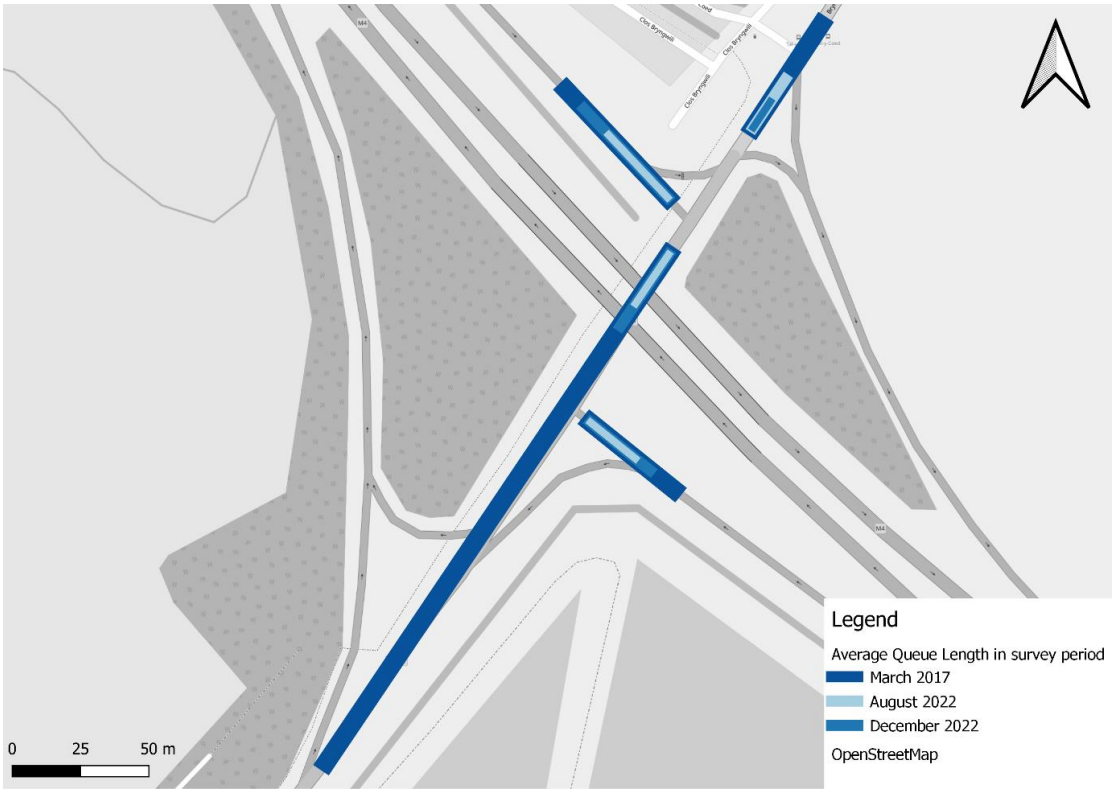


Figure 3-2 *Average queue length comparison, pre and post-scheme*

A comparison of the average queues through the area indicates that queues have generally decreased since the completion of the scheme.

During stakeholder feedback prior to the scheme construction, and since the completion of the scheme has indicated a concern with queueing on the M4 westbound off-slip blocking back onto the mainline of the M4. The queue length data has therefore been assessed to review the maximum queue observed during the survey periods, with a summary being provided in **Figure 3-3** and **Table 3-2**

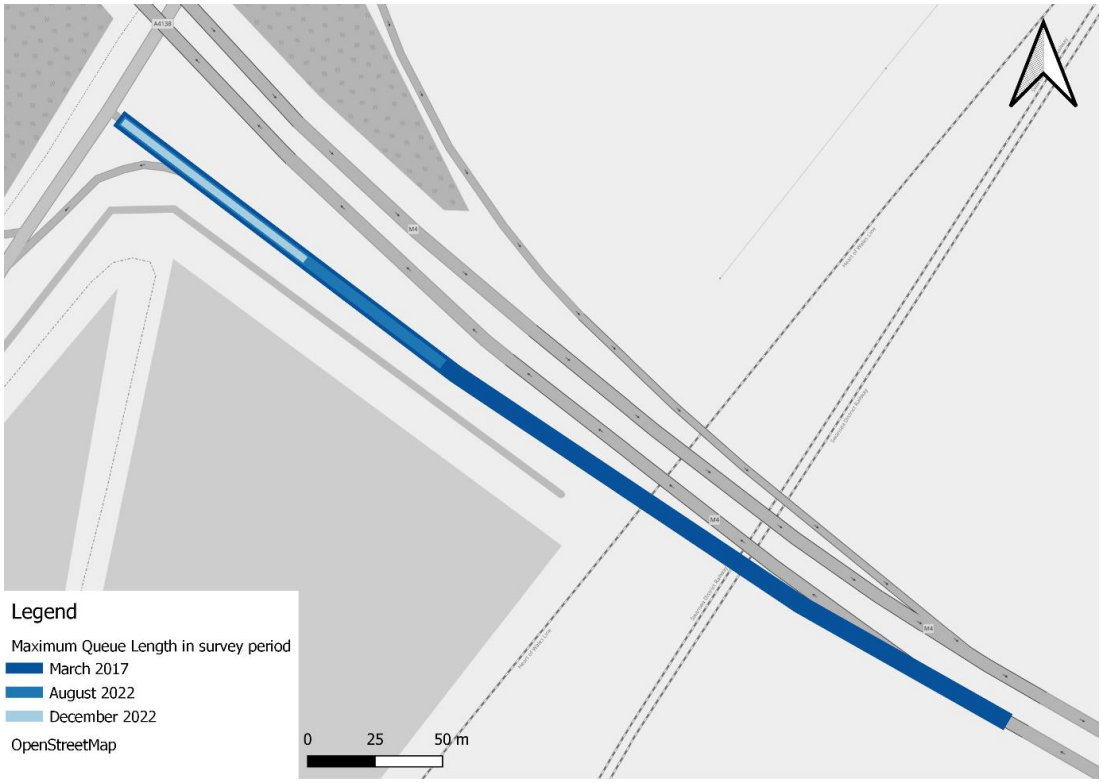


Figure 3-3 *Maximum queue length comparison on M4 WB off-slip, pre and post-scheme*

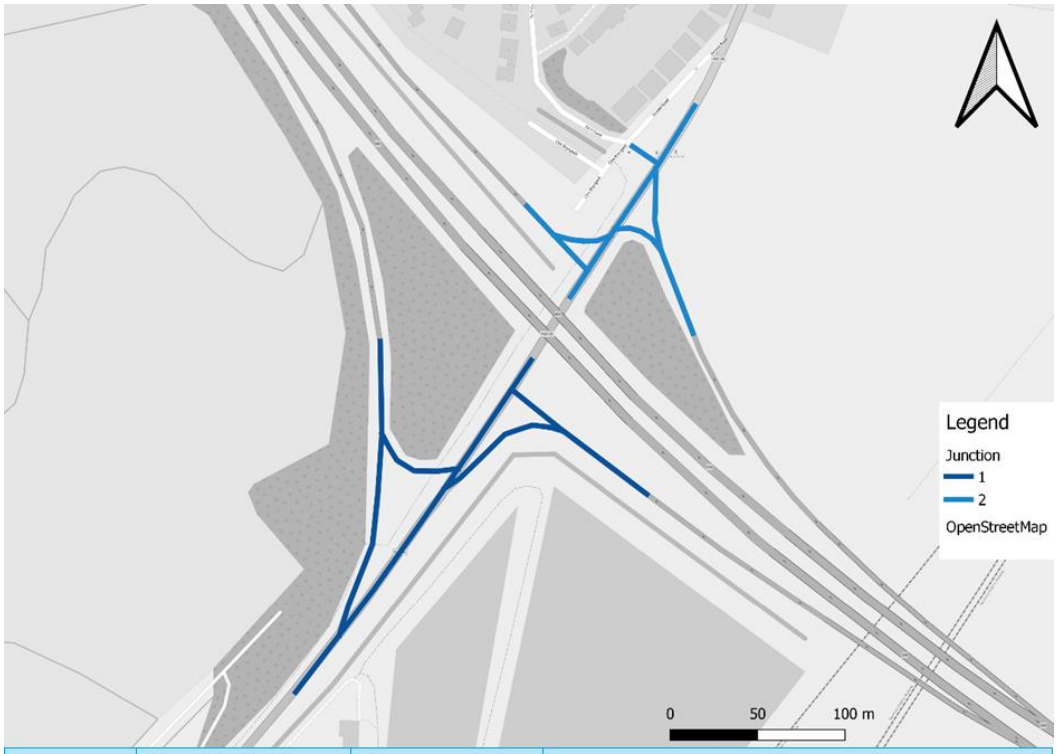
Junction	Pre/post scheme	Date	Queue length	
			7am to 7pm Average	Maximum
Lane 1	Pre scheme	March 2016	10.5	57
	Post scheme	August 2022	5.7	31
		December 2022	7.5	22
Lane 2	Pre scheme	March 2016	5.8	105
	Post scheme	August 2022	5.2	39
		December 2022	0.1	8

Table 3-2 *Maximum queue length comparison on M4 WB off-slip, pre and post-scheme*

The data represents the maximum queue length across the day, therefore capturing the busiest period in terms of queueing on the slip road. The data suggests a significant reduction in the maximum queue observed, during the surveyed periods.

3.3.2. Traffic Flows

Traffic surveys have been undertaken since the delivered scheme has been completed, during the August 2022 (capturing seasonal travel demand) and during December, 2022. The data has been reviewed to understand any potential changes in travel patterns since the completion of the scheme, with both the August and December (2022) surveys being compared against the data collected pre-scheme. A summary of the data across the day is presented in **Figure 3-4**.

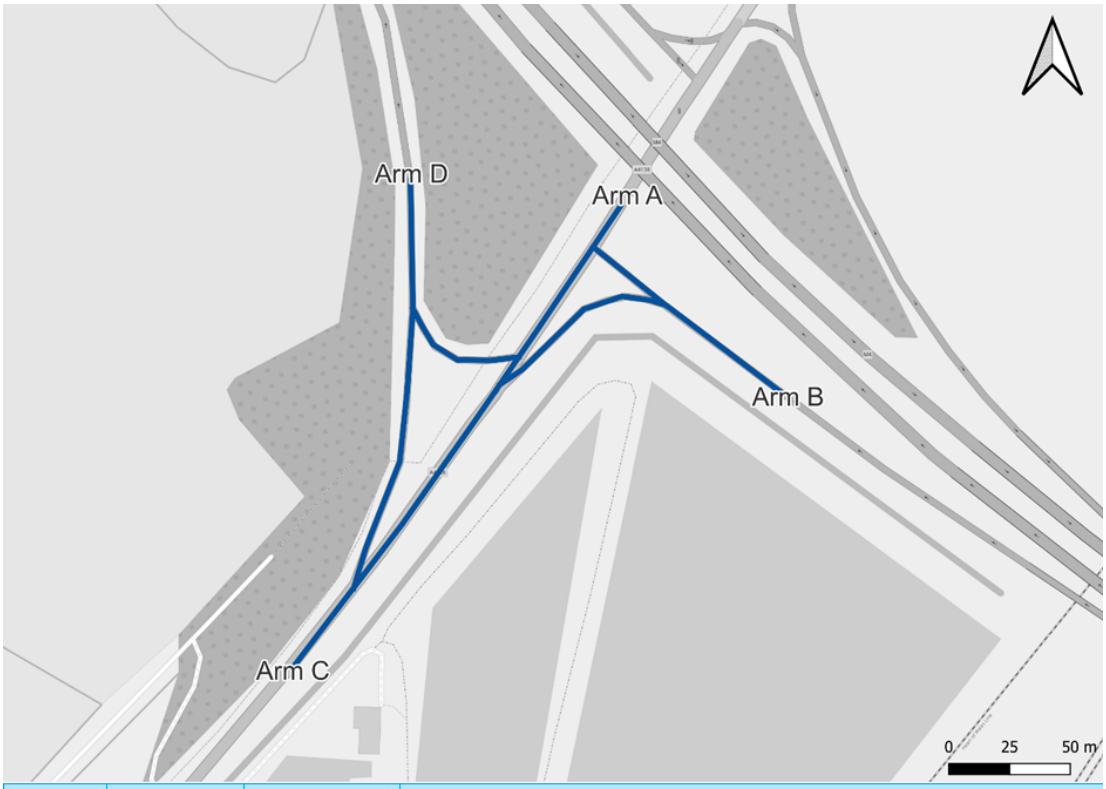


Junction	Pre/post scheme	Date	Weekday flows		
			AM peak	PM peak	7am-7pm total
Junction 1	Pre scheme	March 2016	3045	3109	24200
	Post scheme	August 2022	1981	2685	24493
		December 2022	2228	2729	24846
Junction 2	Pre scheme	March 2016	2536	2112	18464
	Post scheme	August 2022	1607	1843	18404
		December 2022	1959	1916	19052

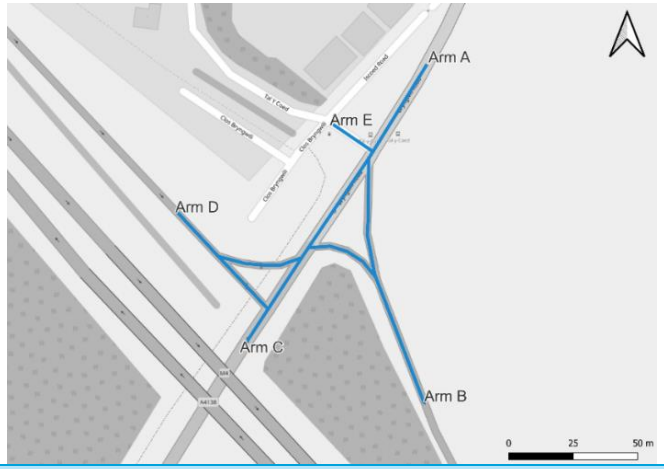
Figure 3-4 *Daily traffic volumes – comparison pre / post-scheme*

The data indicates that peak period traffic flow volumes appear lower during the post-scheme surveys, during both the summer and winter survey. However, when comparing daily total figures the volumes appear comparable. This could indicate that there is an element of peak spreading; a potential impact of the Covid-19 pandemic, which appears to have altered travel patterns.

In terms of travel patterns across the junction the travel patterns are broadly consistent with the turning proportions observed pre-scheme, which suggests that the scheme has little impact on where people are travelling to / from using the junction.



Peak period	Pre/post scheme	Date	Weekday flows						
			A to C	A to D	B to A	B to C	C to A	C to D	Total
AM	Pre scheme	March 2016	773	19	186	690	899	478	3045
	Post scheme	August 2022	467	17	167	442	590	299	1981
		December 2022	586	20	217	463	620	323	2228
PM	Pre scheme	March 2016	598	11	405	781	836	478	3109
	Post scheme	August 2022	511	12	343	686	737	369	2658
		December 2022	566	16	361	624	719	444	2729



Peak period	Pre/post scheme	Date	Weekday flows											
			A to B	A to C	A to E	C to A	C to B	C to E	D to A	D to C	D to E	E to A	E to B	E to C	Total
AM	Pre scheme	March 2016	557	295	11	341	740	5	22	477	11	22	30	20	2536
	Post scheme	August 2022	317	171	6	268	485	6	13	307	0	10	18	8	1607
		December 2022	462	214	8	349	486	7	11	385	1	15	14	8	1959
PM	Pre scheme	March 2016	194	190	20	634	576	33	16	409	4	12	4	10	2112
	Post scheme	August 2022	191	186	11	558	501	23	14	333	4	11	4	8	1843
		December 2022	203	183	17	560	483	34	16	377	4	15	9	13	1916

3.3.3. Active travel usage

Dedicated active travel surveys were not undertaken prior to the scheme construction, however the Automatic Traffic Counts (ATCs) captured pedal cyclists using the carriageway as part of the original surveys. This provides an indication of active travel usage in the area pre-scheme. As part of the post-scheme surveys dedicated active travel surveys were undertaken along the shared-use path adjacent to the A4138 allowing usage of the improved facility for cyclists to be used.

A comparison of the data is presented in **Table 3-3**

Pre/post scheme	Date	Cycling direction		Total Cyclists
		Northbound	Southbound	
Pre scheme	March 2017	8	13	21
Post scheme	August 2022	11	20	31
	December 2022	4	3	7

Table 3-3 *Active travel users (cyclists), pre and post scheme*

The data suggests that active travel usage through the junction, during drier months, is higher than previously captured with a 48% increase in cycle flows across the day. It is also pertinent to note that the post-scheme cyclists are captured off the vehicular carriageway, which is considered a benefit when compared to the pre-scheme data.

It is also noted that cycle flows during the December 2022 surveys are significantly lower than both the August 2022 and pre-scheme data, which is likely to be reflective of the seasonal variation in active travel usage.

3.3.4. User Perception

A post implementation survey was developed to capture information on user perception of the delivered scheme. Questionnaires were delivered to residents of the Tal-Y-Coed and Talyclun residential estates (either side of M4 J48) as well as to CCC for distribution to local members, Dyfed Powys Police and local businesses.

The response options broadly followed the WelTAG seven-point scale (between -3 and +3) to collect responses, with an example being provided in **Figure 3-5**. The full survey is provided in Appendix A for reference, and summarised in the following section.

4. How safe do you consider the layout (compared to the previous layout if familiar)?

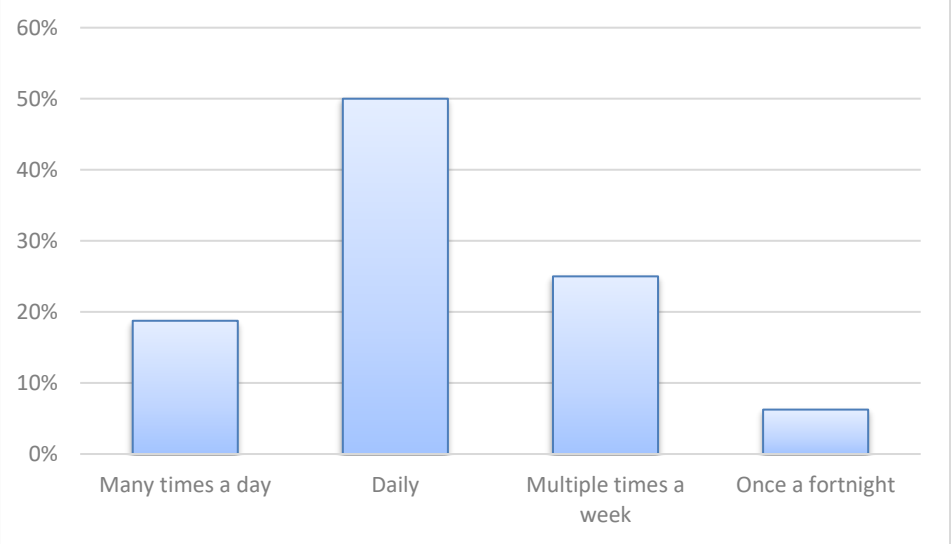
+3 Significantly safer		-3 Significantly less safe	
+2 Moderately safer		-2 Moderately less safe	
+1 Somewhat safer		-1 Somewhat less safe	
0 No change			
Comments			

Figure 3-5 *Example response box*

In total sixteen completed surveys were received, primarily from local residents plus two responses from Dyfed Powys Police. No response was received from CCC despite repeat requests. It is however considered that a sample set has been collected that provides an indication of user perception of the delivered scheme, with the analysis proportionate to the impact of the scheme itself. A summary of the analysis on the responses to each question is provided below.

How often do you travel through M4 J48?

The majority (69%) of respondents travelled through the junction at least once a day, with most respondents using the junction multiple times a week.



What mode of transport do you typically use?

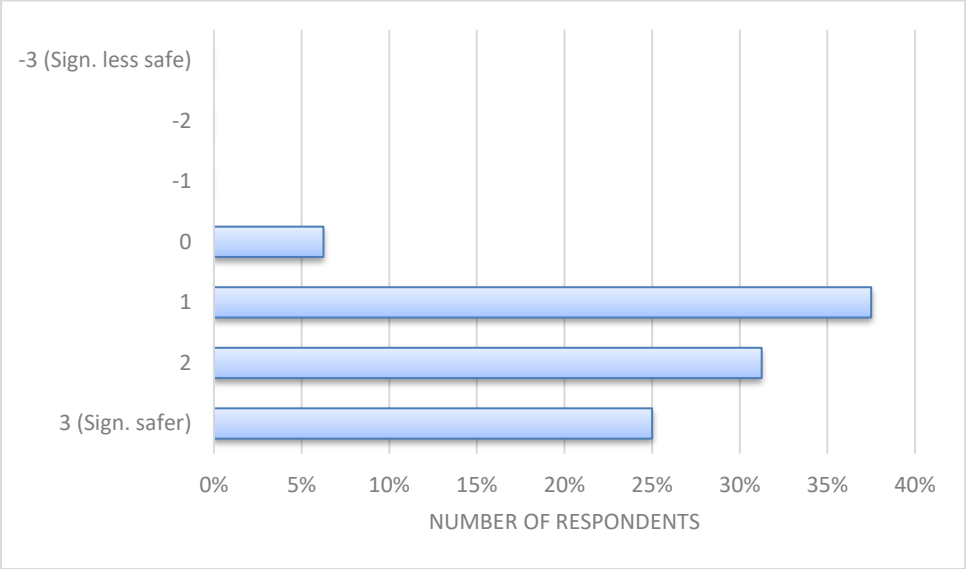
A significant number of journeys by survey respondents were made by solely car (81%), although 100% of respondents used private vehicles, one respondent cycled occasionally, and two respondents used vans.

How familiar are you with the old layout?

All respondents said they were very familiar with the old layout of the junction.

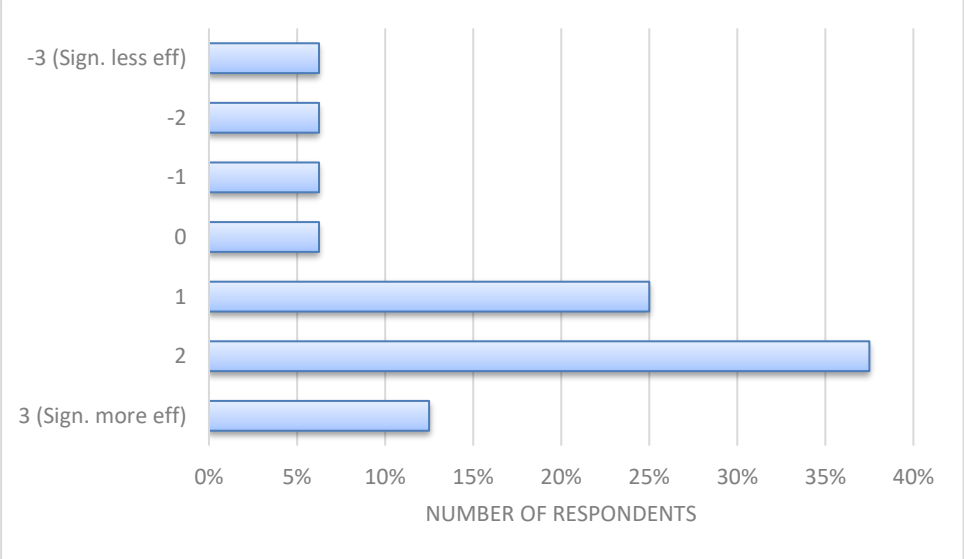
How safe do you consider the layout (compared to the previous layout if familiar)?

All respondents found the layout to be just as safe if not safer than before, with 25% finding it significantly safer, 31% finding it moderately safer, 38% finding it slightly safer, and 6% (one respondent) finding it neither safer nor less safe. As the previous question established, all survey respondents were familiar with the old layout hence all responses can be considered.



To what extent do you feel the scheme has improved efficiency of junction for drivers?

12 respondents (75%) found the scheme to some extent to have improved the efficiency of the junction for drivers.

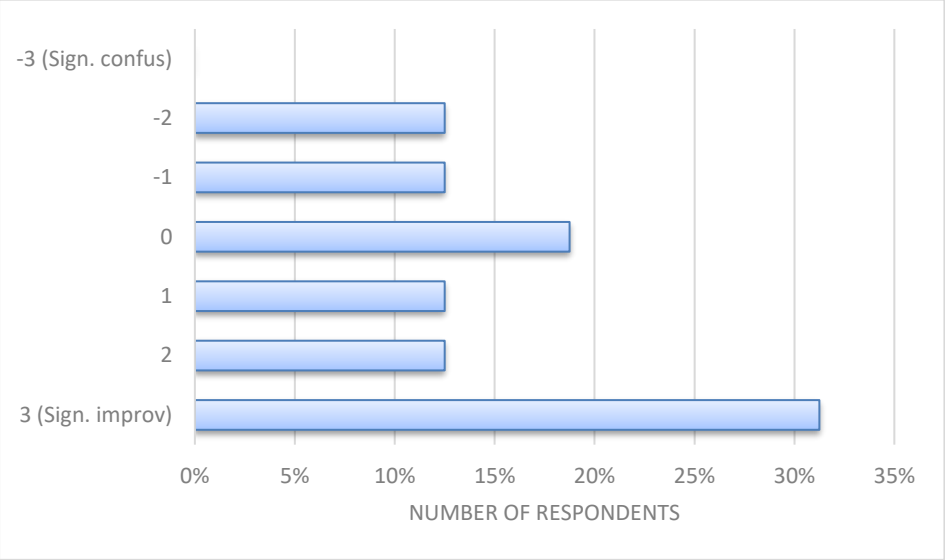


Has the scheme impacted/changed your travel behaviour? (e.g. Are you more aware of people using active travel / Have you changed from travelling by car to on foot / cycle)?

81% of respondents said their travel behaviour had not been affected, 13% said they had become more aware of active travel users, and one respondent wrote N/A.

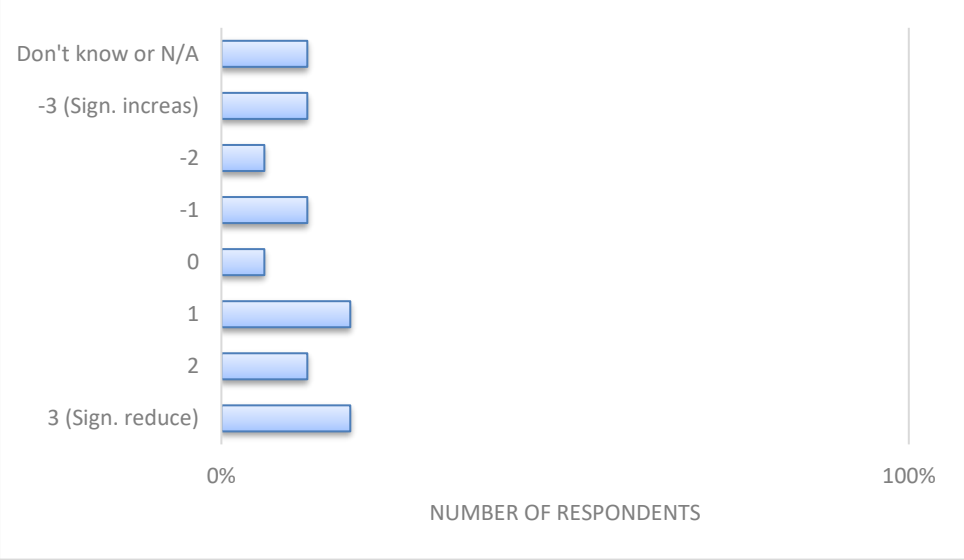
To what extent do you think the road marking changes at the junction have improved your understanding of the junction as a driver?

56% of respondents thought the scheme had improved their understanding of the junction, with 25% of respondents thinking the scheme had confused their understanding of the junction to some degree.

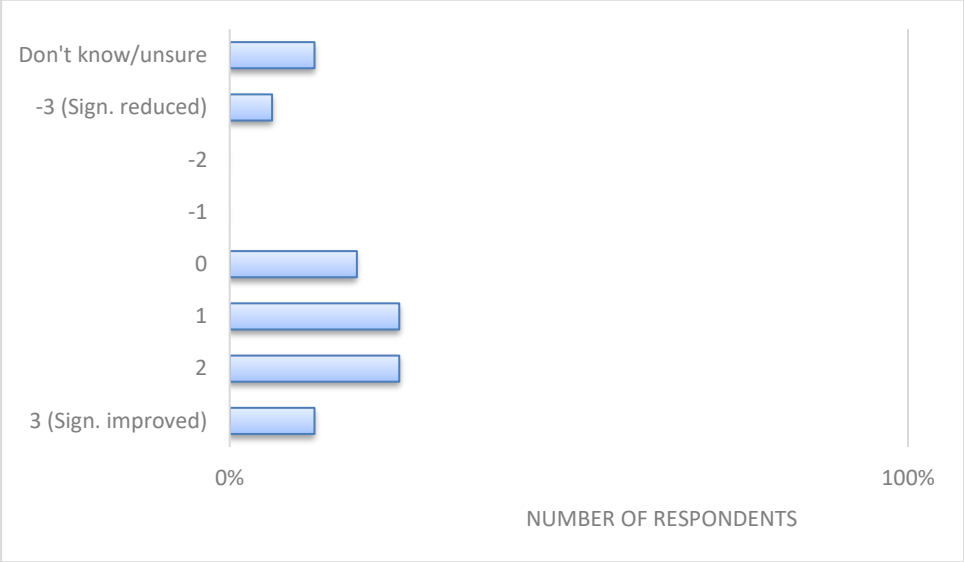


To what extent do you think journey times through the junction are more reliable since the opening of the scheme?

50% of respondents noted some reduction in journey time with 31% recording an increase. The reminder advised there had been no change or answered that they didn't know.



To what extent do you think the scheme has enhanced connectivity for active travel in area?



Ten of the 16 respondents (63%) recorded the scheme as having enhanced connectivity for active travel in the area.

Do you have any other comments in relation to this scheme?

Respondents picked out a variety of themes, summarised **Table 3-4**.

Perception Themes	Summary of Respondent Comments
Users failing to stop at Tal-y-Coed lights	Some drivers ignore the lights. The lights on Tal-Y-Coed are great when leaving the estate but we have to be very careful that drivers on the main road stop on the red lights as this is not always the case as we have had 5 near misses when drivers do not stop. I feel the lights are too close to the junction.
	The only problem I find is the amount of people in cars that fail to stop for red lights to the extent that I find people pause before pulling out of the Tal-y-Coed estate. Cars coming from Pontarddulais also ignore the red light and fill the yellow box going to Llanelli.
	Road users are still not observing the red light/stop line at the Tal-y-Coed junction: users are continuing onward toward Llanelli and stopping at the 2nd stop line.. Continuing straight through the junction when Tal-y-Coed lights are on green.
	Due to the timing and sequencing of the lights, drivers are becoming frustrated with the length of wait and are driving through red lights. Cars coming from the Llangennech direction passing the Taly-y-Coed junction towards Hendy often go through red lights - accident waiting to happen.
	Cautious coming off the Tal-y-Coed site due to drivers ignoring the lights.
	Vehicles not observing red light immediately outside Tal-y-Coed (both directions), several near misses.
Queuing on M4 J48 WB Exit Slip Road	Traffic still on hard shoulder of M4 but it's safer for the traffic going to Hendy from M4.
	There has been no effect to cars queuing to leave the M4 and on to Llanelli. At rush hour the amount of vehicles queuing on the hard shoulder of the M4 is very very dangerous.

Perception Themes	Summary of Respondent Comments
	The queues on M4 hard shoulder are no different than before the work was undertaken - I consider the work to be a waste of time and money
Active travel	The cycle path entry/exit at Talclyn is dangerous and requires you to deviate from your direction. Joining by cycle at Talclyn is problematic - more efficient to remain on the road. As with many cycle paths, the details distract from an otherwise good project.
	Cyclists hardly use it. Some still insist on cycling on the road, holding up traffic where the bollards are and traffic island by Talyclun
	It is a much safer junction now and everybody gets out of the lanes on the lights. A great improvement. Thank you.
Positive general comments	I think the improvements are great for the people of Tal-y-Coed.
	Scheme is step in right direction and better than before, but cameras could be effective in deterring poor driving and there are accidents weekly
	As with many cycle paths, the details distract from an otherwise good project. A good project put in the shade by poor detail.
	Safer for people going towards Hendy.
Negative general comments	I have concerns about the pollution this is causing and the impact this is having on my health. The queues on M4 hard shoulder are no different than before the work was undertaken - I consider the work to be a waste of time and money
	I do wish this had been more thought out more thoroughly and the traffic light timing signals at least can be improved.

Table 3-4 *Summary of general comments*

The Dyfed Powys Police responses also highlight observations of motorists failing to obey the signals on the M4 J48 WB 0ff-slip road, stating "*motorists are sometimes ignoring the red light as you drop down to turn right towards Pontarddulais*".

The Dyfed Powys Police responses specifically relate the queues they have regularly observed on the M4 J48 WB off-slip road to the A4138 / Pontarddulais Road junction on the CCC network not being able to adequately deal with the traffic volume at peak times.

It is considered that on whole, general feedback on the delivered scheme has been positive during the user perception surveys. It is acknowledged however, that there remain some negative perceptions on certain elements. At this stage, it is not considered that the feedback obtained during the user perception surveys necessitates any further mitigation at the junction, however future monitoring of vehicles failing to obey the signals should continue, with mitigation considered if the trend continues.

3.3.5. Collisions

Whilst collisions have been highlighted as one of the metrics for measuring the success of the scheme within the Monitoring and Evaluation Plan, it is not yet possible to review long term collision trends since the scheme was completed due to the time lag between a collision occurring, and the collision data being released.

However, analysis has been undertaken of the available data from both the construction and post opening periods.

Construction (between 1/4/21 and 23/12/21)

- 3 collisions occurred on 27/5/21, 22/7/21 and 10/8/21
- 1 incident was a rear shunt that occurred on the A4138 travelling from Hendy to Llangennech
- 1 incident occurred at the intersection of the M4 J48 WB off-slip and the A4138
- 1 incident occurred at the intersection of the A4138 and M4 J48 EB on-slip
- 2 occurred on the Pontarddulais Road junction Slip Road
- All 3 occurred in fine & dry weather; 2 in daylight, 1 in darkness with street lights present
- All 3 listed 'failed to look properly' as a causation factor
- 2 listed 'disobeyed automatic traffic signal' as a causation factor (both of the junction slip road collisions)
- 1 listed 'failed to judge other person's path or speed' as a causation factor

Post construction between 23/12/21 and 30/06/22

- A single incident occurred on 29/1/22, approximately 1 month after completion of construction
- The collision occurred on the A4138 between Talyclun and Hendy
- 'Illness or disability, mental or physical', 'fatigue, 'distraction in vehicle' and 'loss of control' were listed as contributory factors
- V1 and V2 were travelling in different directions when V1 swerved to o/s into path of V2.
- Fine weather is listed, with a wet/damp road surface, in daylight

A review of the collision data highlights that there were several collisions within the scheme area, however they were slight in their severity and do not indicate an issue with the traffic management that supported the scheme construction.

Since the completion of the scheme there has been a single collisions, however the condition of the driver has been listed as the causation factor, rather than the revised junction layout.

It is recommended however, that collision occurrences should form part of the on-going monitoring of the scheme, with any reports of collisions being noted by the SWTRA networks team.

3.3.6. Journey Times

A review of typical travel time using Inrix has been undertaken in the neutral month of September in 2017 (pre-implementation) and 2023 (post-implementation), to determine whether there has been a significant change in journey times through the junction. The junction has been split into sections to allow a review of different routes through the junctions, as presented in **Figure 3-6**.

Figure 3-6 *Inrix journey times*

A summary of the journey time results during the Am and PM peak hours are presented in

Section	Pre/post scheme	Date	Average weekday AM peak	Average weekday PM peak
			Journey time (s)	Journey time(s)
1	Pre scheme	March 2017	22	57
	Post scheme	March 2023	32	55

Section	Pre/post scheme	Date	Average weekday AM peak	Average weekday PM peak
			Journey time (s)	Journey time(s)
2	Pre scheme	March 2017	52	53
	Post scheme	March 2023	63	64
3	Pre scheme	March 2017	45	51
	Post scheme	March 2023	60	55
4	Pre scheme	March 2017	91	60
	Post scheme	March 2023	56	56

Table 3-5 *Summary of journey time comparisons, pre and post-scheme*

The data indicates that journey times are generally comparable across the junction, with some increases that may be reflective of the additional signal control. It is also noted that there is a decrease along section four, particularly during the AM peak.

However, there are no notable increase in journey time during peak periods, compared to pre-implementation, and so it is not considered that journey times have been significantly affected by the scheme.

3.3.7. Speeds

The Inrix data informing the review of journey times through the junction has also been assessed for speed limit compliance through the junction. A summary of the 75th percentile speeds is for each of the sections is presented in **Table 3-6.**

Observed speeds have demonstrated a reduction in overall speed when the post construction values (September 2021) are compared to the pre-construction values (September 2019), shown in **Table 3-6**. However, the 85th percentile speeds on Route 1 and 4 in September 2021 were higher than the set speed limit of 50mph.

Section	75th Percentile speed (mph) in 2017	75th Percentile speed (mph) in 2023	Compliance with speed limit
Section 1	46	38	Compliant
Section 2	25	20	Compliant
Section 3	26	20	Compliant
Section 4	46	40	Compliant

Table 3-6 *Summary of observed speeds through the delivered scheme.*

The data indicates that generally there has been a reduction in speeds through the junction, and based on 75th percentile records speed limits are generally being complied with. At this stage, it is not considered that additional measures need to be implemented, but speeds should be monitored going forward.

3.3.8. Air Quality

Air quality was not quantitatively assessed during the option development, however since the publication of the new Wales Transport Strategy a greater emphasis is being placed on the impact of transport on air quality.

For the purposes of this WelTAG Stage Four / Five a qualitative review of air quality impacts has been undertaken. It is considered that local air quality is likely to have been improved as a result of the delivered scheme due to:

- Reduction in queueing and subsequent idling vehicle emissions;
- Reduction in vehicle speeds through the junction, and subsequent reduction in emissions; and
- Increase in active travel users during certain months potentially reducing vehicle flows.

3.4. Appraisal against the Monitoring and Evaluation Plan

The appraisal of the scheme performance is presented in **Table 3-7**, against the headlines identified as part of the monitoring and evaluation plan. It is considered that the delivered scheme has, to a large extent, met the expected outcomes discussed in earlier stages of the WelTAG study, and has had a beneficial impact on travel within the local area.

Headline	Appraisal	Justification
Queueing	++	Within the survey period there have been no instances of blocking back to the M4 recorded, and a significant reduction in queueing across the junction is observed. Whilst it is acknowledged that there have been some reports of ad-hoc blocking back this has not been reported as a frequent occurrence; though it should form part of continued monitoring.
Traffic Flows	++	Surveys indicate that traffic flows through the junction have remained relatively consistent across a full day pre-and post-scheme, indicating that there has not been induced traffic through the junction as a result of the improvement. However, there has been a change in the traffic profile, with peak hour flows appearing to be lower; this could be due to the change in travel patterns observed since the Covid-19 pandemic, and could form part of continued monitoring.
Active Travel Usage	+	It has not been possible to undertake a like-for-like comparison of active travel the surveys undertaken post-scheme have captured active travel users on the share-use path. This is considered as a beneficial impact when compared to the pre-scheme ATCs, which captured some cyclists on the highway network.
User Perception	+	Whilst there is some constructive feedback, it is considered that perception of the scheme on the whole is considered positive, with the general feedback suggesting that it is an improvement on the previous layout.

Collisions	0	There has been one reported collision within the scheme area since the construction completion, however this is attributed to driver condition; this has therefore been scored as neutral.
Journey Times	0	Whilst there has been a marginal decrease in traffic volumes during the peak hours, the analysis of journey times across the day indicates broadly comparable journey times through the junction.
Speeds	+	Compliance with the speed limit is generally within expected levels, and there it is considered that there is a safety improvement compared to the old layout due to a reduction speed.
Air Quality	++	It is considered that there has been a beneficial impact on local aur quality due to the reduced queueing observed through the junction, which is likely to result in fewer emission from idling vehicles.

Table 3-7 *Summary of Option Impact Appraisal against the Monitoring and Evaluation Plan*

The analysis has highlighted three possible areas that should be monitored going forward, summarised as follows:

- Collisions – Whilst only a single collision (with illness stated as a causation factor) has been recorded post construction, and no collisions have been reported that can be attributed to the scheme, it is acknowledged that there is a lag between an incident and the formal release of collision data.
- Compliance with signals – It has been highlighted within stakeholder feedback that some drivers are not complying with the signals either on the M4 J48 EB off-slip or on the A4138. This should be monitored with potential mitigation to be investigated in the form of camera enforcement.
- Queuing – Whilst blocking back to the M4 has not been observed during to the two rounds of traffic surveys undertaken post-completion of the scheme, there have been some reports as part of stakeholder feedback. This should be monitored with potential mitigation in the form of signal timing adjustments, including at the A4138 / Pontarddulais Road junction, to be considered in the future.

3.5. Appraisal against objectives and the Well-being goals

A summary of the potential impact of the scheme on the study objectives, and the Well-being goals of Future Generations (Wales) Act determined at earlier stage of WelTAG is provided in **Table 3-8**.

Criteria	Appraisal
TPO1 Improve connection from M4 to A4138	+
TPO2 Improve connection from the A4138 to the M4	+
TPO3 Ensure slip-road queueing does not extend to the M4 mainline	++
TPO4 Improve peak period journey times on the A4138 from Hendy / M4 to the Talyclun signals	+

Criteria	Appraisal
TPO5 Improve journey times on the A4138 from Talyclun signals Hendy / M4	+
TPO6 To contribute to CCC's Active Trave (Wales) Act 2013 Goals	++
A Prosperous Wales	++
A Resilient Wales	+
A Healthier Wales	++
A More Equal Wales	+
A Wales of Cohesive Communities	+
A Wales of Vibrant Culture and Thriving Welsh Language	0
A Globally Responsible Wales	+

Table 3-8 *Option Impact Appraisal Summary – Well-being of Future Generations (Wales) Act*

4. Financial, Commercial and Management Case

4.1. Overview

The WelTAG Stage Four / Five Financial Case compares the envisaged costs at Stage Three with the outturn costs of implementing the scheme. As part of the Commercial Case summarises the procurement route of the delivered scheme and confirms funding streams. It also considers any risks that remain outstanding that were identified within WelTAG Stage Three. The Management Case summarises the project management process that was undertaken during the construction of the scheme and the requirements for its on-going maintenance.

4.2. Financial Case

The outturn costs of the delivered scheme are greater than those envisaged at WelTAG Stage Three, as shown in **Table 4-1,** however it is noted that construction occurred part way through the Covid pandemic and during a period of high inflation.

Cost Type	Cost
Estimated Construction Costs (excluding risk, at 2018 prices)	£2.0m
Outturn Construction Costs (at 2021 prices)	£3.52m

Table 4-1 *Estimated Construction Costs compared to Outturn Costs*

The reason for this uplift in expenditure was due to unforeseen site costs during construction:

- High rates of inflation during part of the period between the original estimate being prepared and the scheme being tendered
- Additional Traffic Management Costs associated with the additional works identified below;
- Government restrictions in place in relation to the Covid Pandemic (Social distancing) requiring additional transport and site welfare facilities;
- Programme extension primarily due to DCWW being unable to promptly attend site and also being unwilling to confirm their plant protection requirements for a period of weeks;
- Additional constraints imposed by DCWW on working methodology following award of the contract which limited size of plant and prevented conventional excavation methodologies being applied in some areas
- Discovery of an unchartered mine entrance within the earthworks; and
- Discovery of some unchartered services.

4.3. Commercial Case

As the local highway authority, CCC procured the construction works through their highways construction framework The scheme was funded by the Welsh Government through the award of a local transport grant.

A Risk Register was prepared as part of the detailed design. No additional risks were identified or realised during the construction of the scheme and those relevant to construction have been closed.

4.4. Management Case

Atkins regularly consulted with SWTRA, as the overseeing organisation, during the construction of the scheme. No issues of note were raised by the site supervisor during the weekly site reports.

A table of lessons learnt is presented in **Table 4-2.**

Description	Topic	Impact	Lesson Learnt
Construction cost estimate lower than out turn cost – additional TM plus high inflation rates and unforeseen work identified on site.	Detailed Design	Additional funding required during construction phase	Inclusion of additional contingencies within design construction cost estimate to account for potential increases. In relation to DCWW related additional costs, written commitments regarding working methodologies to be obtained from DCWW prior to proceeding to tender.
Coordination with maintenance	Detailed Design	As-built reporting could have been more comprehensive if CCC requirements were understood at commencement	Whilst BIM compliant data was provided as part of the H+S File, consultation with CCC's maintenance department following submission of the document suggested they might have requested further information had they been aware it could be provided.
Feedback Questionnaire	Post construction	Increased response rate	Whilst a reasonable rate of the public questionnaires was received, limited response was obtained from other parties. In person feedback sessions could be arranged if warranted in future.
Planning of works	Detailed Design	Ensured no additional congestion during construction	Advance meetings with SWTRA and CCC ensured Atkins understood the priorities and concerns of all parties and were consequently able to incorporate these as tender requirements for the Principal Contract to work in accordance with.
Regular liaison with WG, SWTRA and CCC	Detailed Design and construction	Ensured all key stakeholders were fully aware of the proposals	Regular communication with the key stakeholders to continue to be undertaken during all stages of design and construction to ensure they are fully informed about the work.

Table 4-2 *Lessons Leant Log*

On-going maintenance of the scheme will fall within the standard CCC maintenance programme, and therefore no specific management structures are required to be set in place as part of this WelTAG Stage Four / Five. Due the scale of the works, it is considered that lifetime costs will be absorbed within the standard CCC maintenance budget.

5. Summary and Conclusion

5.1. Summary

This WelTAG Stage Four / Five has reviewed the impact of the delivered scheme at the M4 J48 / A4138 junction. It is considered that the delivered scheme was implemented broadly in line with the expectations set out at WelTAG Stage Three.

An appraisal of the performance of the scheme against the Monitoring and Evaluation Plan has indicated that the impacts of the scheme are largely as expected at WelTAG Stage Three, and the scheme has largely met expectations in terms of beneficial impacts.

A summary of the beneficial impacts, against the expected targets set out within the Monitoring and Evaluation Plan are presented in ***Table 5-1***

Headline	Appraisal	Justification
Queueing	++	Within the survey period there have been no instances of blocking back to the M4 recorded, and a significant reduction in queueing across the junction is observed. Whilst it is acknowledged that there have been some reports of ad-hoc blocking back this has not been reported as a frequent occurrence; though it should form part of continued monitoring.
Traffic Flows	++	Surveys indicate that traffic flows through the junction have remained relatively consistent across a full day pre-and post-scheme, indicating that there has not been induced traffic through the junction as a result of the improvement. However, there has been a change in the traffic profile, with peak hour flows appearing to be lower; this could be due to the change in travel patterns observed since the Covid-19 pandemic, and could form part of continued monitoring.
Active Travel Usage	+	It has not been possible to undertake a like-for-like comparison of active travel the surveys undertaken post-scheme have captured active travel users on the share-use path. This is considered as a beneficial impact when compared to the pre-scheme ATCs, which captured some cyclists on the highway network.
User Perception	+	Whilst there is some constructive feedback, it is considered that perception of the scheme on the whole is considered positive, with the general feedback suggesting that it is an improvement on the previous layout.
Collisions	0	There has been one reported collision within the scheme area since the construction completion, however this is attributed to driver condition; this has therefore been scored as neutral.
Journey Times	0	Whilst there has been a marginal decrease in traffic volumes during the peak hours, the analysis of journey times across the day indicates broadly comparable journey times through the junction.

Speeds	+	Compliance with the speed limit is generally within expected levels, and there it is considered that there is a safety improvement compared to the old layout due to a reduction speed.
Air Quality	++	It is considered that there has been a beneficial impact on local aur quality due to the reduced queueing observed through the junction, which is likely to result in fewer emission from idling vehicles.

Table 5-1 *Summary of Option Impact Appraisal against the Monitoring and Evaluation Plan*

The principle benefits of the scheme are a **reduction in queueing across the junction**, in particular on the M4 off-slips, and the **provision of an improved active travel connection along the A4138.**

5.2. Recommendations

This report has identified possible areas for future monitoring going forward, summarised as follows:

- In responding to the post scheme questionnaire, a number of residents of the Tal-Y-Coed housing estate commented that they have observed motorists on the A4138 jumping a red light. Dyfed Powys Police also made similar comments in relation to the M4 J48 WB off-slip road. A CCTV red light conformance survey could be undertaken over a seven day period to record the level of non-conformances. If high levels are recorded, a review of the traffic signals intergreen periods could be undertaken and consideration given to camera enforcement of the red light.
- Consultation should be undertaken with CCC to understand any future works they have proposed for the A4138 / Pontarddulais Road junction which was noted by Dyfed Powys Police to be the likely starting point of queues that extend to the M4 J48 WB off-slip at peak times.
- Whilst only a single collision (with illness stated as a causation factor) has been recorded post construction, and no collisions have been reported that can be attributed to the scheme, it is acknowledged that there is a lag between an incident and the formal release of collision data.

APPENDICES

APPENDIX A

User Perception Survey

1. How often do you travel through M4 J48?

2. What mode of transport do you typically use?

3. How familiar are you with the old layout?

4. How safe do you consider the layout (compared to the previous layout if familiar)?

+3 Significantly safer		-3 Significantly less safe	
+2 Moderately safer		-2 Moderately less safe	
+1 Somewhat safer		-1 Somewhat less safe	
0 No change			
Comments			

5. To what extent do you feel the scheme has improved the efficiency of the junction for drivers?

+3 Significantly more efficient		-3 Significantly less efficient	
+2 Moderately more efficient		-2 Moderately less efficient	
+1 Somewhat more efficient		-1 Somewhat less efficient	
0 No change			
Comments			

6. Has the scheme impacted/changed your travel behaviour? (e.g. Are you more aware of people using active travel / Have you changed from travelling by car to on foot / cycle)?

7. To what extent do you think the road marking changes at the junction have improved your understanding of the junction as a driver?

+3 Significantly improved		-3 Significantly more confusing	
+2 Moderately improved		-2 Moderately more confusing	
+1 Somewhat improved		-1 Somewhat more confusing	
0 No change			
Comments			

8. To what extent do you think the journey times through the junction are more reliable since the opening of the scheme

+3 Significantly reduced journey time		-3 Significantly increased journey time	
+2 Moderately reduced journey time		-2 Moderately increased journey time	
+1 Somewhat reduced journey time		-1 Somewhat increased journey time	
0 No change			
Comments			

9. To what extent do you think the scheme has enhanced connectivity for active travel in the area

+3 Significantly improved connectivity		-3 Significantly reduced connectivity	
+2 Moderately improved connectivity		-2 Moderately reduced connectivity	
+1 Somewhat improved connectivity		-1 Somewhat reduced connectivity	
0 No change			
Comments			

10. Do you have any other comment in relation to this scheme?

If you would like any further information on this scheme, please email jon.robinson@atkinsglobal.com

APPENDIX B

RSA3 Response Report

ATKINS

Member of the SNC-Lavalin Group

M4 J48 UPGRADE

STAGE 3 ROAD SAFETY AUDIT RESPONSE REPORT

Carmarthenshire County Council

March - 2022

Notice

This document and its contents have been prepared and are intended solely as information for March - 2022 and use in relation to Health and Safety file. **Error! No document variable supplied.** assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents. This document has 14 pages including the cover.

Document history

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Document reference:

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	First Issue	T P P	DM	JR	JR	March - 2022

Client signoff

Client	Carmarthenshire County Council
Project	M4 J48
Consultant Job Number	51544985205234
IRIS Reference	16/SW/CPS/001
Client signature/date	

Contents

Tables

1. Introduction

This Road Safety Audit Response Report relates to the Stage 1 Road Safety Audit Report, document reference 8003-385 for M4 Junction 48 and A4138 Improvement Works.

1.1. Scheme Summary

The site is located on A4138 Pontarddulais Road at M4 Junction 48 (approximate co-ordinates 257748,203170). A WelTAG appraisal was carried out by Atkins following concerns of congestion on the A4138 and J48 of the M4 during Peak periods. The appraisal identified key issues and options and recommended Option 2A to be taken forward and developed. This option has been developed to preliminary design stage and proposes to reduce congestion by increasing capacity on the A4138 through carriageway widening works and controlling movements on the slip roads by introducing/upgrading signal control to the existing junctions.

The works include

- Realignment of central reservation on the A4138 under M4 overbridge
- Removal of the southbound give way line on the eastbound on-slip
- Re-arrangement of the M4 eastbound off-slip signals
- Extension of the two lane A4138 northbound approach to beyond the M4 westbound on slip entry. This arrangement will increase the two-lane approach by c.110m to a total of c.260m, further reducing the likelihood of traffic travelling to the M4 eastbound on-slip blocking straight-ahead traffic to Hendy on the A4138 northbound.
- Signalising the M4 westbound off-slip and the right-turn from the A4138 southbound to the westbound on-slip. Through doing this, the queues on the M4 westbound off-slip right turn lane can be more effectively controlled to ensure queueing does not extend back to onto the M4 mainline.
- As part of the signalisation of the M4 westbound off-slip, signalised stop lines will be provided on the A4138 in both directions and on the right-turn lane on the off-slip. The left turn movement from the off-slip to the A4138 southbound carriageway will remain uncontrolled.
- Introduction of traffic signals at the Tal-Y-Coed junction immediately to the north of the M4 J48 eastbound off-slip road.
- Linking of all proposed traffic signals to ensure efficient operation of the junction.

1.2. Design organisation representative

The representatives from the design organisation who prepared the RSA response are:

[redacted] Highways Engineer
[redacted] Highways Principal Engineer

2. Key Personnel

2.1. Overseeing Organisation

[redacted]

Engineering Design
Highways and Transportation
Environment Department
Carmarthenshire County Council

2.2. Road Safety Audit Team

[redacted]	Audit Team Leader
[redacted]	Audit Team Member
[redacted]	Audit Observer

2.3. Design Organisation

Atkins
West Glamorgan House
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SA1 5AD

Left Blank Intentionally

3. Key Personnel

Table 3.1: Road safety audit decision log for items raised in the previous Stage 1 RSA Response report JR17_201-ATK-HGN-SWTRA-DO-D-0001

RSA problem	RSA recommendation	Design organisation response	Stage 2 Recommendation	Stage 2 designers' response	Overseeing Organisation response	Agreed RSA action
PROBLEM 1 ***Location:*** A4138 main carriageway through the junction. ***Summary:*** Potential for 'see-through' of downstream traffic signals.	As the design is progressed, the traffic signal layout/alignment and staging should prevent or minimise the likelihood of 'see-through' for A4138 users in both directions. ***RSA 1 Note:*** *The newdesigns show an additional set of traffic signals, which may lead to a greater likelihood of 'see-through' of downstream traffic signals.*	Noted - Additional louvres could be added to the green and amber signal aspects, if required to help minimise the issue of 'see through' on the first 2 sets of traffic signals on the A4138 north-eastbound approach. The 69m distance between the first and second stop line is normally considered sufficient that they will not be required on the second set. The 59m between the second and third stop line may justify louvres on the third set, although It is hoped the phasing/ staging arrangement will negate the need for the louvres, with drivers not seeing a downstream green when held on a red signal. ***RSA 1 note response:*** *The audit comments are noted and will be considered during the detailed design.*	This concern is likely to need to be reviewed at the stage 3 RSA site visits. It is noted that louvres have been included in the traffic signal design at the Tal-y-Coed and M4 eastbound off-slip junctions to reduce the likelihood of this problem.	Agreed - Louvers have been included on some signal heads to help minimise the issue of 'see through'. Furthermore, this issue will be reviewed on site as part of the Site Acceptance Test to determine if additional measures are required.		
PROBLEM 2 ***Location:*** A4138 north-eastbound main carriageway. ***Summary:*** Possible confusion about the location of the right turn.	The traffic signal, traffic sign and road marking layouts should be designed to give clear guidance about the location of the right turn. ***RSA 1 Note:*** *Response acknowledges the problem and highlights design features that could help to mitigate the problem if included in the design.*	Agreed - On the A4138 north-eastbound approach, the first and second set of signals could display 'ahead only' green arrows that indicate an ahead movement only. These could be backed up with blue box signs to Diagram 606 (indicating direction of travel) mounted on the signal. This would be subject to detailed design, and any Traffic Regulation Orders that may be existing or introduced. The signal head arrangement at the third set of traffic signals, where the right turn is made, is subject to detailed design and final modelling output. ***RSA 1 note response:*** *The audit comments are noted and will be considered during the detailed design.*	The road markings and traffic signs included in the design would appear to provide clear guidance to users seeking the right turn onto the M4 eastbound onslip. This problem appears to be resolved.	No further comment		

PROBLEM 3 ***Location:*** M4 westbound on-slip priority layout. ***Summary:*** Traffic signals may lead to misunderstanding priorities.	As part of the design proposals, the layout of the give way on the on-slip should be reviewed to ensure priorities are clear. Visibility between the traffic streams approaching from the left and right turns off the A4138 should be improved if the existing layout is to be retained. ***RSA 1 Note:*** *Response acknowledges the problem and identifies design features that could help to mitigate the problem if included in the scheme. Mirroring the design of the eastbound onslip at this location where two lanes run side-by-side may further mitigate this problem.*	Agreed – The visibility at the give way line to vehicles approaching from the left will be improved by the proposed on-slip carriageway realignment and proposed wider verges behind the footways. Street furniture in the splitter island will be reviewed and relocated as required to provide better visibilities to vehicles approaching and waiting at the give way line. ***RSA 1 note response:*** *The audit comments are noted and will be considered during the detailed design.*	The give way layout for the meeting of the two streams from different A4138 directions has been retained and there still would appear to be an awkward angle to look to the left for users giving way. It is noted that the geometry of the northbound A4138 diverge onto the slip road is different from the existing layout and it would appear that traffic speeds at this diverge may be lower in the proposed layout, providing greater reaction time for all users. The previous recommendation to copy the layout of the eastbound onslip and allow the two streams of traffic to retain a lane (without a give way) and merge further downstream on the slip road has not been adopted. The RSA team believes this would represent a layout with reduced safety risk.	Noted – The give way layout has been retained primarily due to the relative levels of the two approaches at that location with the approach from the left (Llanelli) falling to the south and approach from the right (Hendy) falling to the north. Reprofiling the carriageway to bring the crest curve in accordance with design standards for through traffic would require a reduction in levels and significant reprofiling of both approaches, works which are beyond the scope of this scheme. It is noted that the alignment of the give way will match the existing, a location at which no accidents have been recorded in the most recent three year period. As part of the scheme visibility enhancements between the traffic streams approaching from the A4138 will be improved by vegetation clearance and reprofiling of the existing cutting slope bounding the left turn. Furthermore, the existing safety barriers on the splitter islands and verges will also be removed to improve visibility and the permanent speed limit on the A4138 will be reduced from 40mph to 30mph.		
PROBLEM 4 ***Location:*** Traffic signal junction at end of the M4 eastbound off-slip. ***Summary:*** Queuing traffic may blockother movements atthe junction.	The operation of the junction should be assessed to determine if a yellow box marking is required to assist in keeping the junction clear. ***RSA 1 Note:*** *Response acknowledges the problem and identifies design features that could help to mitigate the problem if included in the design.*	Agreed - No traffic signal issues are envisaged, however excessive queue lengths on the M4 eastbound off-slip could be detected andsubject to queue clearance logic to prevent thequeue from reaching the main carriageway. This is subject to detailed design and the outcome of the modelling for maximum queue lengths. ***RSA 1 note response:*** *The audit comments are noted and will be considered during the detailed design.*	No yellow box markings are included in the design. The problemwas acknowledged by the designteam at the previous stage of RSA and therefore it could be assumed that the design has taken account ofthe problem in a different way. This should be reviewed once the scheme has been completed to determine if a retro-respectively-installed yellow box marking would be of benefit.	Noted – From reviewing the modelling as part of the detailed design it is not envisaged excessive queuing will be an issue at this junction. This will be monitored and reviewed as part of the traffic signals Site Acceptance Test with additional yellow box markings to be added if deemed necessary.		
PROBLEM 5 ***Location:*** Right turn onto the A4138 from the M4 eastbound off-slip. ***Summary:*** Users could pass on the wrong side of the traffic island.	As the design is progressed, measures should be included to guide users to the left of the traffic island. ***RSA 1 Note:*** *Option 2A looks likely to provide greater guidance on the correct route than Option 2B.*	Agreed - The location of the secondary traffic signal is intended to focus driver's vision on the far kerb edge, with a green arrow indicating the right turn movement. ***RSA 1 note response:*** *The audit comments are noted with Option 2A to be developed during the detailed design.*	The layout of the traffic islands, roadmarkings and traffic signs in the design would appear to resolve thisconcern.	No further comment		

PROBLEM 6 ***Location:*** Right turns from the A4138 onto both M4 on-slips. ***Summary:*** Provide clarity about priorities for right-turning users.	Right turn filter signal heads should be included in the traffic signal layout at the right turns onto both on-slips. ***RSA 1 Note:*** *Right turn onto eastbound onslip: a separate filter phase would provide improved safety and remove the potential for conflict between vehicles in opposing directions.* *Right turn onto westbound onslip: the revised drawing indicates that the design will include a separate right turn filter phase which will remove the potential for conflict.* *These concerns should be reviewed at the Stage 2 RSA.*	Noted - The existing right turn onto the M4 eastbound on-slip is a separately signalled right turn, with its own red/amber/green. Subject to final modelling results being received for maximum capacity, it is possible this right turn could be retained, separately signalled, with no conflicting traffic, or subject to capacity each movement at the junction could run as a separate movement, with no conflicts. It is not possible to have the same arrangement at the M4 westbound on-slip, as the right turn already has its own separately signalled movement, with no conflicts. ***RSA 1 note response:*** *The audit comments are noted and will be considered during the detailed design.*	The detailed design would appear toinclude features to clarify priorities atthe right turn movements.	No further comment		
PROBLEM 7 ***Location:*** Downstream end of the M4 eastbound off-slip. ***Summary:*** Pedestrians at risk of stepping into the path of vehicles.	The traffic signal layout should incorporate formal pedestrian aspects and push buttons to give advice when crossing the end of the off-slip. ***RSA 1 Note:*** *If the Toucan crossing indicated on the scheme drawings providedas part of the RSA brief is retained, then this problem would be resolved.*	Noted - The introduction of pedestrian facilities is possible from a signal operation point of view, with the pedestrian phase running in a 'walk with' situation when the A4138 runs. However, the need for formal facilities should be justified based on the number of pedestrians; the impact on capacity (due to longer intergreens) and the requirement to have pedestrian facilities at the other signal junctions, to complement the NMU route. Pedestrian counts could be undertaken to record the likely level of demand. ***RSA 1 note response:*** *The audit comments are noted and will be considered during the detailed design.*	A Toucan crossing has been incorporated into the design and therefore this problem appears to have been resolved.	No further comment		
PROBLEM 8 ***Location:*** A4138 northbound approach to the westbound onslip turning ***Summary:*** Lack of lane designation information.	Traffic signs showing lane designation should be provided to assist drivers in advance of the lane changes, to enable drivers to decide well in advance which lane they need to be in before reaching the signal-controlled junction.	Agreed. Appropriate signs and potentially road markings in accordance with the TSRGD shall be added during the detailed design.	Traffic signs and road markings incorporated into the design appear to provide clear guidance and thus itappears that this problem is resolved.	No further comment		
PROBLEM 9 ***Location:*** Northbound exit onto westbound onslip. ***Summary:*** Uncontrolled shared use path crossing.	**'**LOOK RIGHT' text should be provided on the carriageway to notify northbound path users of the direction of approaching traffic. Similarly, 'LOOK LEFT' text should be provided for southbound path users at the onslip.	Agreed. LOOK RIGHT and LOOK LEFT road markings to be provided on both the northbound and southbound paths during the detailed design.	The recommended road markings have been added to the scheme andthis concern is addressed.	No further comment		

PROBLEM 10 ***Location:*** Eastbound offslip. ***Summary:*** Vehicles over-running kerbs.	Swept-path analysis should be undertaken to inform the kerb and island design at this location.	Agreed. Swept path analysis has been undertaken to specify the proposed kerb lines. A drawing shall be produced documenting these details for inclusion with the RSA2 to confirm adequate clearance has been allowed.	Swept path analysis has been undertaken and appears to show theproblem has been resolved.	No further comment		

Table 3.2: Road safety audit decision log for items raised in the previous Stage 2 RSA Response report JR17_201-ATK-HGN-SWTRA-DO-D-0002

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
PROBLEM 1 ***Location:*** South-westbound A4138 exit from the junction. ***Summary:*** Merging of two lanes would take place close to the crest.	The two-to-one lane merge location should be retained but the red surfacing, hatching and bollards should be terminated further upstream (to the north-east) to allow slower vehicles in the offside lane greater opportunity to move to the nearside lane.	Agree – The chevron markings, red surfacing and bollards have been amended to terminate further upstream to allow a longer merge length.		
PROBLEM 2 ***Location:*** Shared use path on the north-west side of the A4138. ***Summary:*** Maintenance bays behind the shared use path could lead to conflicts with path users.	The maintenance bays should be provided alongside the carriageway with the shared use path routed behind the bay with an appropriate separation to prevent the opening door of a vehicle affecting path users.	Noted - The southern maintenance bay has been omitted from the design with maintenance vehicles to use the northern bay. As the maintenance bay is expected to have very low usage typically one or two maintence visits per year and the bay is sufficient wide at 3.5m to allow vehicles to park without having doors opening onto the SUP we propose to leave the maintenance bays behind the SUP. Relocating the maintenance bay to the carriageway edge and diverting the SUP behind would result in a more onerous route for SUP users and could also encourage parking from members of the public.		
PROBLEM 3 ***Location:*** North-eastern end of the shared use path at Clos Bryngwili. ***Summary:*** Ongoing route is unclear for cyclists. Route can be blocked by parked vehicles.	Wayfinding signs should be provided to clarify the ongoing route for cyclists (and pedestrians where appropriate). Parking restrictions should be installed to discourage parking at the end of the shared use path and allow enforcement if this is ignored.	Noted- The designer will request that the local authority confirms the active travel routes beyond the scheme extents so that wayfinding signs can be provided. The SUP tie-in will be relocated closer to the existing footway so that parking on Close Bryngwili does not conflict with the SUP.		

Table 3.3: Road safety audit decision log for items raised Stage 3 RSA

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
PROBLEM 1 ***Location:*** End of the shared use route at the junction of the A4138 and Tal-Y-Coed ***Summary:*** Injudicious pedestrian crossing manoeuvres may result in collisions	The end of the shared use route should include an uncontrolled crossing point for pedestrians travelling along the A4138 to/from Hendy.	Noted – The SUP provision terminates at the Tal-Y-Coed junction due to this being the agreed extent for the works with the layout for pedestrians being consistent with the layout prior to construction. Any further works are beyond the scope of this scheme.		
PROBLEM 2 ***Location:*** End of the shared use route at the junction of the A4138 and Tal-Y-Coed ***Summary:*** Ponding may lead to skidding, slipping or falls.	The areas liable to ponding should be resurfaced to provide adequate crossfall for water to drain from the shared use path.	Noted – it is understood that DCWW have been investigating a potential water main leak at this location which may be the source of the water observed. SUP levels have been checked and confirmed to fall towards the adjacent Clos Bryngwili.		
PROBLEM 3 ***Location:*** End of the shared use route at the junction of the A4138 and Tal-Y-Coed ***Summary:*** The end of the shared use route does not provide sufficient linkage to existing facilities for cyclists tojoin and leave the route safely and comfortably.	Additional provisions are required to enable cyclists to join and leave the new shared use path safely. This may include links through the residential street at the end of the scheme to rejoin the A4138 further away from the signal controlled junction at Tal-y-Coed, thus negating the need for cyclists to use the signal controlled junction at all.	Noted – as per the response to problem 3.1, additional provisions beyond the site extents are considered beyond the scope of the current scheme but should be considered as part of any future route enhancements.		
PROBLEM 4 ***Location:*** End of the shared use route at the junction of the A4138 and Tal-Y-Coed ***Summary:***	The white ‘give way’ style markings should be removed which would take away the confusion for pedestrians and reduce the likelihood of pedestrians using the strip close to the carriageway edge. Alternatively, the existing paved area which joins into the shared use path and the side road Clos Bryngwili couldbe improved to provide a footway for pedestrians.	Disagree – the ‘give way’ markings have been provided due to northbound cyclists having to rejoin the carriageway at this location hence are intended as a prompt to ensure cyclists are aware that they have to give way. As such, removing these markings may increase the risk of a cyclist not giving way when rejoining the carriageway. It is noted that there is no ‘pedestrian’ marking provided in the separation strip or signage present to indicate it is a segregated route, hence it is anticipated that pedestrians would use the SUP as they would any other footway or SUP.		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
PROBLEM 5 ***Location:*** End of the shared use route at the junction of the A4138 and Tal-Y-Coed ***Summary:*** Potentially slippery road markings in an area where cyclists are turning / braking may result in skidding and falls.	The skid resistance of the red surfacing and road markings should be investigated to determine if the skid resistance is suitably similar to the rest of the path. If the skid resistance is determined as insufficient then measures should be taken to ensure that a suitable skid resistance is provided.	Noted – products have been specified suitable for SUP use with marking dimensions specified as per the TSRGD to minimise surface area. It is noted that ARAF/SLOW SUP text is also provided on the approach to encourage cyclists to reduce speed before reaching the give way markings, thereby reducing the risk of skidding.		
PROBLEM 6 ***Location:*** Signal-controlled crossing of the M4 southbound off-slip. ***Summary:*** Pedestrians or cyclists waiting at the crossing may be hit or clipped by turning vehicles.	The pushbutton should be moved closer to the tactile paving and slightly further back from the edge of the carriageway to encourage users to wait further back from the edge of the tactile paving. This would allow users to push the button with ease and to wait in a less vulnerable place.	Noted - The push button is located at 0.5m from the tactile paving as per normal design practice to ensure signals clearance. Moving the signal pole back will likely compromise the primary traffic signal visibility for motor vehicles hence increasing the risk of them not being seen. As referenced in the RSA problem, at this location there is a wide radius with no evidence present of tactile paving being over run by passing vehicles since this crossing point was constructed in autumn 2021. As such, it is recommended that no physical changes are made at this time with the location monitored.		
PROBLEM 7 ***Location:*** Verge of the A4138 eastbound lane opposite the M4 northbound off-slip ***Summary:*** Sign position may lead to drivers wrongly driving on to the off slip.	The sign should be relocated closer to the M4 onslip to reduce the risk of confusion for drivers.	Disagree – The sign has been located the required distance from the junction in accordance with the TSM and it is considered that moving it closer would increase the risk of last minute lane changes. Whilst it is acknowledged that the current location is in the vicinity of the WB exit slip, as demonstrated by the image below, the sign is located to the north of the slip road with the alignment of the NB central island kerb line having been design to deter motorists from incorrectly entering the WB entry slip. As such it is recommended that no changes to the sign location are made. The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
PROBLEM 8 ***Location:*** The shared use route, scheme-wide ***Summary:*** Skidding or tripping hazards present on the shared use route.	A maintenance plan should be formulated and agreed to ensure the shared use route is kept clear of debris that could become a hazard to users of the route, particularly as the gradient of the route may encourage higher cyclist speeds.	Agree – Maintenance of the SUP will be undertaken by Carmarthenshire County Council consistent with their existing policies for SUPs within the county.		
PROBLEM 9 ***Location:*** The shared use crossing of the M4 northbound on-slip that is accessed by drivers heading onto the M4 from the A4138 westbound lane. ***Summary:*** Westbound pedestrians or cyclists may not see approaching right turning vehicles.	'Look left' and 'look right' markings should be added to the carriageway at the crossing point.	Disagree – This crossing point is signal controlled hence users should only be crossing the slip road when directed to do so by the traffic signals. As such the provision of 'Look left' and 'Look right' markings are not considered to provide any benefit and may even encourage users to cross when the traffic signals do not direct them to.		
PROBLEM 10 ***Location:*** The shared use crossing of the M4 northbound on-slip that is accessed by drivers heading onto the M4 from the A4138 westbound lane. ***Summary:***	The immediate approach to the crossing should be regraded to provide a less steep gradient.	Noted – The gradient of the tactile paving has been measured as having an approximately 1 in 11 fall therefore slightly steeper than the 1 in 12 recommended, this gradient is consistent over a 4m length and therefore does not pose a sudden change in gradient immediately at the crossing point which could destabilise users with wheelchairs. The gradient is present due to the transition from the adjacent trief kerbs to carriageway level, with the trief kerbs having been specified at this location to enable a suitable SUP crossfall to be provided without requiring significant reconstruction of the adjacent carriageway. Furthermore, the red HFS provides good skid resistance and warning of the crossing point while approaching on this gradient.		
PROBLEM 11 ***Location:*** The shared use crossing of the M4 northbound on-slip that is accessed by drivers heading onto the M4 from the A4138 westbound lane. ***Summary:*** Pedestrian / cycle stage may not provide suitable time for all users to cross.	The pedestrian/cyclist stage of the signal-controlled crossing should be increased to provide sufficient time for users to cross safely and comfortably.	Disagree - The crossing width is approximately 7m and the pedestrian /cyclist green time is 5 seconds with a fixed intergreen time of 7 seconds. Due to the short crossing distance these timings are considered appropriate. It is noted that increasing any of these timings would have a detrimental effect on the operation of the junction as a whole.		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
PROBLEM 12 ***Location:*** Shared use uncontrolled crossing of the M4 northbound on-slip filter lane from the A4138 eastboundlane. ***Summary:*** Pedestrians at the diverge island may be hit or clipped by vehicles	To highlight the presence of the diverge island and help reduce the open nature of the site which increases the likelihood of inappropriate vehicle speeds, red surfacing should be added to the diverge hatching and a bollard to the island. If it is deemed practical, it may also be beneficial to provide an increased level of protection to pedestrians and cyclists such as Trief kerbs or similar at the edge of the island.	Agree – Whilst it is noted that the speed limit at this location has been reduced to 30mph as part of the scheme, it is agreed that the provision of a blank face reboundable bollard at this location would help to highlight the presence of the diverge island.		
PROBLEM 13 ***Location:*** Shared use route alongside the A4138 west of the farm accesses. ***Summary:*** Separation between the shared use route and the 40mph carriageway may lead to loss of balance orcontrol for pedestrians or cyclists.	The separation strip should be increased to 1.5m where the shared use route is alongside the carriageway with a 40mph speed limit or the speed limit amended to cater for the reduced separation strip.	Noted – the separation strip has been provided as per the original design which was considered as part of the stage 2 RSA. Whilst it is agreed that the width of the separation strip does not conform to current Active Travel Act requirements, providing the additional 1m strip would have significantly increased the cost of the works due to the profile of the adjacent verge and would potentially have required acquisition of third party. As such during the design phase it was agreed to proceed as per the current layout as it is currently anticipated that usage of this length of SUP will be low, however if this were to increase in the future, further widening works could be undertaken. Extending the 30mph speed limit was also discounted as this would be unlikely to be self enforcing due to the gradient of the site.		
PROBLEM 14 ***Location:*** Shared use route alongside the A4138 west of the M4 junction ***Summary:*** Gradient of shared use route may lead to high cycle speeds and difficulties for users of wheelchairsor similar.	Sections of level paved area at regular intervals alongside the route to enable users to stopand rest should be provided. These areas should also include benches for pedestrians and areas for users of wheelchairs to park up and rest next to the benches. It may also be beneficial to determine if cycle speeds are problematic and develop proportionate remedial measures.	Noted – as per the response to problem 3.13, providing level areas of paving at regular intervals would add significant additional cost to the scheme due to the profile of the adjacent verge and the longitudinal gradient of the A4138. In some areas this would not be feasible without acquiring third party land. It is noted that one existing bench is present along the route as shown in the image below. The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
PROBLEM 15 ***Location:*** Brynymor farm access ***Summary:*** Current layout of farm access may result in increased collisions	The entire operation of the 3-lane carriageway section should be reviewed with a view to providing a merge in advance of the farm access. Reducing the length of the bollards could also resolve the issue with drivers cutting across the splitter island	Noted – whilst it is agreed the layout at the Brynymor farm access is unconventional, it remains as per prior to the works, albeit with the introduction of the 1m separation strip between southbound traffic. The owner of the farm has been consulted and confirm they have no issues with accessing or egressing from their access which is a similar scenario to the existing. In terms of the recommendation to merge southbound traffic to the north of the farm access, this would significantly reduce capacity and be likely to lead to tailbacks onto the M4 westbound carriageway in the evening peak period hence is not considered viable. Reducing the length of the bollards within the existing layout has also been discounted as this will potentially lead to motorists primarily only using the southbound lane 1 downstream of this point, thereby again increasing the likelihood of queuing traffic extending back to the mainline westbound M4.		
PROBLEM 16 ***Location:*** End of shared use route at western scheme limit near Llaeth Beynon Dairy ***Summary:*** Users exiting the shared use facility may be struck.	The immediate approach to the crossing should be regraded to provide a less steep gradient. Additionally, measures to improve visibility of the crossing for drivers should be provided.	Disagree – the gradient of the tactile paving is 1 in 13 and therefore in accordance with design requirements. The uncontrolled crossing has been sited to maximise the distance from the A4138 whilst also minimising the diversion distance from the through route for users of the SUP. Vehicle usage and speeds are low on the approach to the crossing due to the alignment of the carriageway at this location hence it is considered that ample visibility of the crossing point has been provided.		
PROBLEM 17 ***Location:*** Right turn lane to go to M4 westbound on-slip ***Summary:*** New road layout may not be understood.	New traffic signal layout ahead' signs (Diagram 7014) should be provided on the approachto the signals. It may also be beneficial to do some post opening observations / investigations to determine if thiscontinues to be an issue, which may then require further action to rectify.	Disagree – the junction concerned is signal controlled as referenced in the RSA hence motorists should conform to the operation of the signals. The provision of additional signage is not considered necessary, particularly as the signals have been operating for more than 3 months at the time of this response being prepared hence it is considered that all local drivers will now be familiar with the layout.		
PROBLEM 18 ***Location:*** End of M4 northbound off-slip. ***Summary:*** Stop line may not be visible on approach which may lead to hard braking or non compliance**.**	It is recommended that suitable visibility of the stop line is provided, this may require reprofiling the carraigeway.	Noted – While the stop line visibility is restricted on the distant approach it is clearly visible at 30m back and therefore allows road users to comfortably see the stop line and come to a controlled stop when the signals are on red. The 50mph outlaying speed limit and the immediate 30mph speed limit on the approach to the stop line helps reduce speeds to allow road users to undertake a safe controlled stop when the traffic signals are on red.		

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
PROBLEM 19 ***Location:*** Signal-controlled junction between M4 eastbound off-slip and A4138 northbound. ***Summary:*** Short intergreen may result in collisions between opposing stages.	The signal timings should be amended to provide sufficient intergreen periods to avoid the risk of collisions between vehicles moving in different directions.	Noted - During the traffic signals commissioning the intergreens were revalidated to their optimum values. It is considered that introducing a further increase on the M4 slip road and A4138 would reduce the efficiency of the junction which would be likely to impact on its operation at peak times, potentially resulting in an increase in queuing traffic and the likelihood of rear shunt collisions. As the intergreens were found to be appropriate during the traffic signals commissioning, it is recommended that this is monitored.		

4. Design organisation and Overseeing Organisation statements

1.1 Design organisation statement

On behalf of the design organisation I certify that:

1) the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation.

1.

Name:	[redacted]
Signed:	[redacted] ……...
Position:	Principal Engineer
Organisation:	Atkins
Date:	04/03/22

1.2 Overseeing Organisation statement

On behalf of the Overseeing Organisation I certify that:

1) the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the design organisation; and

2) the agreed RSA actions will be progressed.

Name:	
Signed:	……...
Position:	
Organisation:	

Daniel Morris

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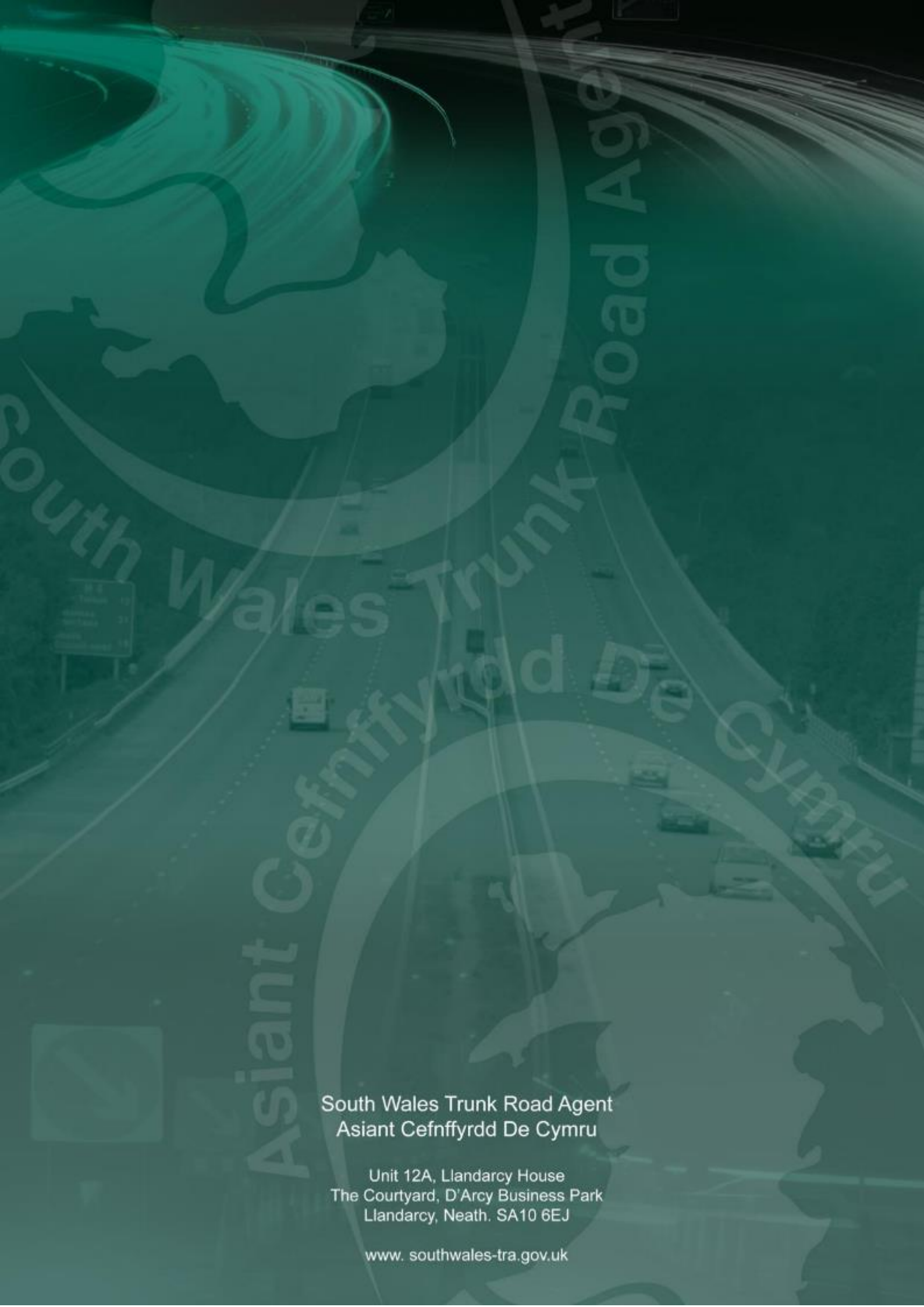

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