Road Safety Audit – M4 Junction 47

Stage:	**1**
Location:	**M4 Junction 47, Swansea**
Site:	**Proposed modifications to the M4 J47 Penllergaer Interchange**
ATSS Ref:	**260110**
Client Ref:	**Stantec UK Ltd**
Date:	**9 February 2026**

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Project Details

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Prepared by:	**Avon Traffic & Safety Services Ltd**
On behalf of:	**Stantec UK Ltd**

Report Control Sheet

	Name	Position	Date
Audit requested by	Elizabeth Clark	Stantec UK Ltd	4 February 2026
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Observer	N/A	N/A	
Draft report issued by	James Dawson	Team Leader	7 February 2026
Final report issued by	James Dawson	Team Leader	9 February 2026
Designer's response issued by	Elizabeth Clark	Stantec UK Ltd	9 February 2026

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Appendix D – Designer's Response **separate document**

1. Introduction

1.1 Avon Traffic & Safety Services Ltd has been commissioned by Stantec UK Ltd, to undertake a Stage 1 Road Safety Audit, with regard to the proposals to modify the lane arrangements on the southern side of the M4 Junction 47 roundabout. The proposals include replacing an existing hatched lane on the south side of the roundabout with a running lane (increasing the available circulatory carriageway from 2 lanes to 3), and providing a two-lane exit to the A48 (west) in place of the existing single lane exit. Following the previous road safety audit at this site, the proposals have been modified to include widening of the A48 on its northwest side, allowing the approach lanes to be shifted to the left, to provide a longer merging lane on the exit from the roundabout onto the A48, hence the need for a revised audit report.

1.2 The RSA Brief was supplied by Stantec UK Ltd and accepted by the Audit Team. The Brief and Audit Team were approved by Elizabeth Clark, Stantec UK Ltd. The site was subject to a stage 1 road safety audit in August 2025 (ATSS ref. 250709). A further site visit has not been considered necessary; therefore this audit has been carried out as a desk-based study of the revised proposals.

1.3 Penllergaer interchange is a large and relatively heavily trafficked part-signalised roundabout situated at Junction 47 of the M4 motorway. The roundabout connects the M4 (running east-west), with the A483 (which branches off south into Swansea approx. 8 Km away) and the A48 which runs east-northwest towards the town of Pontardulais approx. 5.5 Km away, before rejoining the M4 at Junction 49 Pont Abraham. The interchange area is road dominant consisting of three circulatory lanes apart from the southernmost area which is currently two-lanes. The highway appears to be of a good standard with appropriately wide running lanes, central road markings, a series of surface water drains and a system of streetlighting in place. The roundabout is sign posted as 30 mph and a number of roundel road markings are prescribed around the circulatory. There is a footway on the eastern side of the interchange linking Penllergaer Forest (to the north of the roundabout) with the A48 to the southwest. Part of the footway appears to have recently been upgraded to shared use and a toucan crossing installed across the A483. The interchange is bounded by verge and trees. Other surrounding land use includes residential housing located to the south of the M4 around the A48 and A483, and Swansea Services to the north, accessed directly by a service road from the roundabout (providing amenities such as fuel, food and a hotel). The nearest bus stops are located approximately 325 metres to the southwest on the A48 near Penllergaer Primary School. Other amenities and trip generators in the area include a service station, pub and church at Penllergaer roundabout approximately 475 metres to the southwest. The nearest train station is at Cockett located just off the A483 and approximately 4.5 Km to the south, on the suburban fringe of Swansea.

1.4 The audit team members are:

James Dawson – Team Leader

Tasos Papaloucas – Team Member

1.5 The audit took place during February 2026 and comprised of a desktop examination of the documents/plans listed in Appendix A. The auditors previously visited site together between 14.15 and 15.05 on Tuesday 19 August 2025 when the weather conditions were cloudy and warm, and the road surface dry. Vehicle flows were moderate, and speeds appeared commensurate with the posted 30mph speed limit. Five cyclists were observed using the circulatory shared footway/cycleway and two pedestrians, one of which was a parent with buggy.

1.6 Data from Crashmap.org show that there have been 2 reported collisions involving injury, in the 5 years 2020-2024 inclusive, in the vicinity of the proposals. These both occurred where the A483 enters the roundabout on its south side, and both involved a car colliding with a 2-wheeled vehicle. The first occurred in August 2020 involving a pedal cycle, the second in September 2023 involving a motorcycle. Both collisions resulted in a slight injury to the 2-wheeled vehicle rider.

1.7 An Automatic Traffic Count from March 2025 shows vehicle flows on A48 (SW bound) as 864 (am peak hour) and 1165 (pm peak hour). No existing speed data has been supplied or predicted vehicle flows.

1.8 The audit team have not been made aware of any departures from standards or relaxations in relation to the proposed scheme.

1.9 The audit was carried out under the terms and conditions of DMRB GG 119. The team examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design with any other criteria. However, reference may be made to National/Local Guidance in order to verify a point.

1.10 Documents and drawings examined in this safety audit are listed at Appendix A.

1.11 General views of site (from August 2025 site visit)



Looking west from the southern side of the Penllergaer roundabout towards the proposed new lane, which will replace the hatched area



View east from southern side of the roundabout looking back towards the proposed new lane (circled)



View of the current exit arm off the roundabout towards A48 (SW bound), proposed to become two-lanes



View north along A48 towards the roundabout where the two lane exit is proposed

2. Safety Issues Raised in this Stage 1 Road Safety Audit. (see Appendix B for locations)

2.1 Problem

Location – On the gyratory at the proposed new traffic lane for the A48

Summary – Risk of loss-of-control collisions due to road surface condition

The method of removal for the hatched road markings has not been described and the exposure to the underlying surface could present a different texture and grip level compared to the remaining running lane. An inconsistency in skid resistance and surface finish, particularly under wet conditions, introduces a heightened risk of loss-of-control collisions, especially for two-wheeled vehicles and during braking or evasive manoeuvres for the signals. Drivers may also be visually misled by any residual markings or discoloration, reducing their ability to judge lane discipline and road alignment accurately.



View of the current hatched markings on the south side of the roundabout at the proposed new dedicated A48 (SW bound) lane

Recommendation – Ensure that the final road surface provides consistent skid resistance and texture across the full width of the running lane and that no residual or 'ghost' markings are present that could cause driver confusion.

2.2 Problem

Location – On southern part of the gyratory in proximity to the exit leg for A48

Summary – Risk of rear-end shunt and side-swipe collisions due to lane impediment

During the site visit it was observed (at times) that there is limited stacking space at the signal controlled arm beyond the A48 exit. This queue on the roundabout causes vehicles to slow or stop unexpectedly. The proposed two-lane exit could create high exit volumes and when a queue forms on the gyratory could create an increased risk of shunts or side-swipes at this conflict point as vehicles may make sudden lane changes.



Looking west on southern side of roundabout at traffic stacked up at the proposed two-lane exit

Recommendation – Ensure safe operation of the proposed modifications can be achieved through means of a traffic model to predict capacity, queues and delays at key junctions of the roundabout. Signal timings may need adjusting to account for the extra lane.

2.3 Problem

Location – On the gyratory on approach to proposed modified traffic lane arrangements

Summary – Risk of side-swipe collisions due to absence of lane guidance information

There is an absence of clear lane guidance information and priority for the new traffic lane and two-lane merge section. Obscured road markings (due to heavy traffic) and lack of advanced signage could lead to uncertainty in lane positioning, particularly at the multi-lane approach to the junction and merge area. This could lead to hesitation or aggressive behaviour and side-swipes as drivers may unintentionally deviate from their intended path, especially during periods of heavy traffic or poor visibility (e.g. night-time or adverse weather).

Recommendation – Ensure road markings are clear and evident and advanced signage is present to guide driver behaviour, particularly in preparing drivers of the upcoming exit merge.

2.4 Problem

Location – Downstream of roundabout exit at proposed two-lane/merge area on the A48

Summary – Risk of loss-of-control collisions due to poor carriageway condition

The carriageway surface downstream of the roundabout exit is severely worn and contains potholes. This creates an uneven and degraded road surface where vehicles are expected to accelerate and/or brake to merge, increasing the risk of loss-of-control, particularly for two-wheeled vehicles. The poor condition also leads to erratic vehicle movements as drivers attempt to avoid the defect, potentially resulting in side-swipe or rear-end collisions during the merge. Furthermore, the damaged surface poses ongoing maintenance implications and may discourage proper lane discipline.



View of the poor carriageway condition in proximity to the merge point on the A48 exit

Recommendation – Resurface the affected section of carriageway to restore an even and safe driving surface. The resurfacing should extend through the merge area to ensure consistent skid resistance and surface quality.

2.5 Problem

Location – Across the proposed carriageway widening and two-lane exit from the roundabout

Summary – Risk of loss-of-control and side-swipe collisions between vehicles due to potential for adverse camber/opposing crossfalls

The proposal includes for the widening and realignment of the carriageway and modification of the splitter island to form a two-lane exit from the roundabout. The site has an existing crossfall from east to west towards the proposed widening and the central section of the two-lane exit will utilise part of the existing offside northbound lane, creating a risk of inconsistent crossfalls across the full width of the exit. No cross-section information has been provided as part of the submission. As a result, the audit team is unable to determine how surface water drainage will be safely accommodated or whether the proposed layout will introduce adverse camber across the widened carriageway, the exit taper, or between adjacent lanes. If inappropriate or inconsistent crossfalls are introduced, there is an increased risk of loss-of-control type incidents due to vehicle instability, surface water ponding and side-swipe collisions where vehicles are accelerating and diverging.

Recommendation – Review crossfalls across the widened carriageway, exit taper and splitter island to demonstrate a safe and consistent arrangement with no adverse cambers.

2.6 Problem

Location – At the two-lane exit from the roundabout

Summary – Risk of nose-to-tail collisions between vehicles due to impeded forward visibilty

The general arrangement drawing indicates a visibility distance of 48m on the A48 exit, measured along the back edge of the existing shared-use footway. However, it was observed during the site visit that vegetation currently encroaches into this visibility envelope. If vegetation is not removed and regularly maintained, visibility may be reduced below that required for safe operation of the exit, increasing the risk of late decision-making by drivers exiting the roundabout and leading to nose-to-tail collisions.



View north east from the A48 exit back towards the roundabout (existing vegetation issue circled)

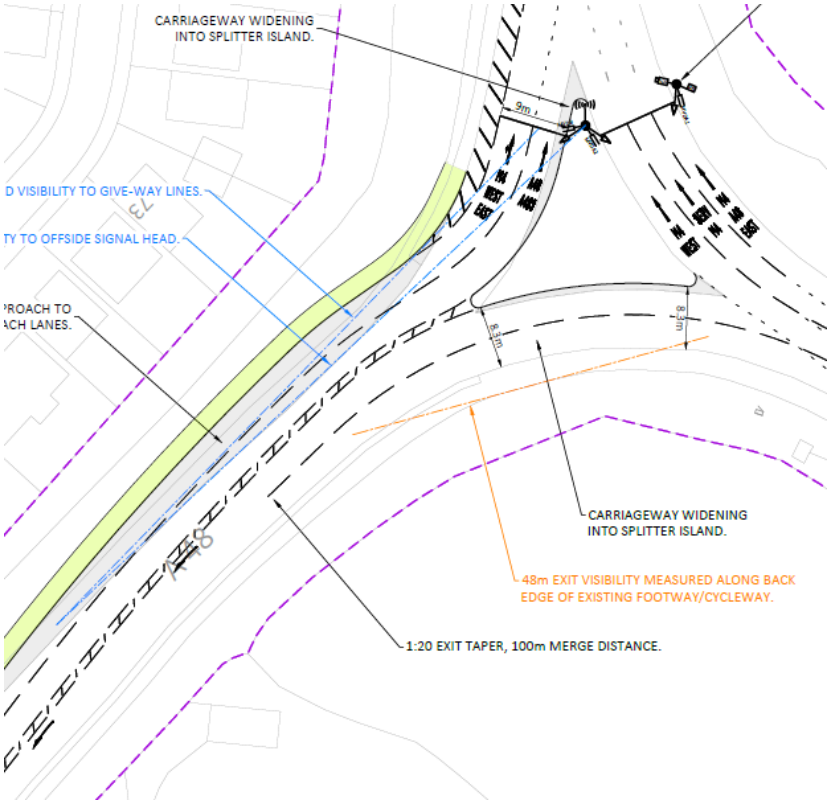
Recommendation – Reassess the visibility splay to account for existing and future vegetation growth, and that the design minimises reliance on maintenance to achieve the required visibility.

2.7 Problem

Location – Along north western extents of the A48 carriageway widening

Summary – Risk of vehicle conflict and loss-of-control type collisions due to bank instability and compromised trees through earth works

Widening of the carriageway requires excavation into the existing verge on the western side of the carriageway. This is likely to result in a steep embankment and significant disruption to existing vegetation, including a number of trees. If trees are retained close to the carriageway edge or on newly formed banks, they may become unstable or present a fixed-object hazard, particularly during high winds or adverse weather. Unstable or poorly protected trees and steep verge banking close to the carriageway could result in trees or branches falling into the carriageway, posing a hazard to road users. There is also the increased severity factor of run-off road collisions due to rigid objects being located close to the carriageway edge.



Extract from 333800855-STN-XX-XX-DR-D-0001 General Arrangement - Option B

Recommendation – Carry out a detailed assessment of the verge stability and undertake a tree retention/removal plan as part of the detailed design. Trees that cannot be safely retained at an appropriate distance from the carriageway should be removed to reduce collision severity and weather related hazards.

2.8 Problem

Location – Full extents of the western A48 verge

Summary – Risk of loss-of-control, side-swipes and rear-end shunt type collisions due to lack of signing information

No details have been provided regarding existing or proposed signing and street lighting, including whether current assets will be retained, relocated or replaced as part of the scheme. In the absence of this information, signs or lighting columns may cause obstruction to forward visibility or if located within the carriageway or clear zone from carriageway edge result in a collision risk. If substandard advanced signing information is provided, there is a risk of driver confusion and hesitation, which may lead to side-swipes and rear-end shunts. This risk would be exacerbated if inadequate illumination is available, particularly during heavy traffic, poor visibilty conditions or hours of darkness.



Looking south on the A48 away from the roundabout. Carriageway widening/realignment is proposed on the adjacent side within the verge to allow a longer two-lane exit nearside (existing signage circled)

Recommendation – Provide detailed signing and lighting layouts, identifying the location, relocation or removal of existing assets, to ensure adequate visibility, illumination and roadside safety. Note the existing lane destination sign on this approach (pictured right) reflects the existing 3 lane approach, so will need to be updated to reflect the proposed 2 lane approach



2.9 Problem

Location – General

Summary – Risk of loss-of-control type collisions due to absence of drainage provision

No drainage details have been provided as part of the Stage 1 submission, including the location of gullies and anticipated surface water flows. Without this information, surface water may not be adequately drained, leading to ponding on the carriageway and an increased risk of skidding in wet or icy conditions, reducing safety for all road users, particularly motorcyclists and cyclists.

Recommendation – Provide details of drainage proposals, including surface water flow paths and gully locations to demonstrate effective surface water management and avoidance of carriageway ponding.

2.10 Problem

Location – General

Summary – Risk of loss-of-control collisions due to carriageway surfacing joints and irregularities

No information has been provided for audit regarding the proposed resurfacing strategy for the widened carriageway and exit lanes. Longitudinal and transverse joints may occur within the wheel tracks. These joints are likely to deteriorate more rapidly, leading to uneven surfaces. This could lead to surface irregularities and furthermore, joints present an increased risk for two-wheeled vehicles.

Recommendation – Provided a uniform high-quality running surface across the full width of the amended carriageway extents, avoiding patches and joints within wheel tracks wherever practicable.

3. Audit Team Statement

We certify that this audit has been carried out in accordance with DMRB GG 119

Audit Team Leader:

Name: James Dawson BSc (Hons); EngTech FIHE Reg RSA; AMRSGB; NH Cert. Comp. Senior Auditor

Signed:  Date: 9/2/2026

Audit Team Member:

Name: Tasos Papaloucas MCIHT; MSoRSA; NH Cert. Comp. Senior Auditor



Signed: Date: 9/2/2026

Appendix A – Information Utilised in this Stage 1 Road Safety Audit

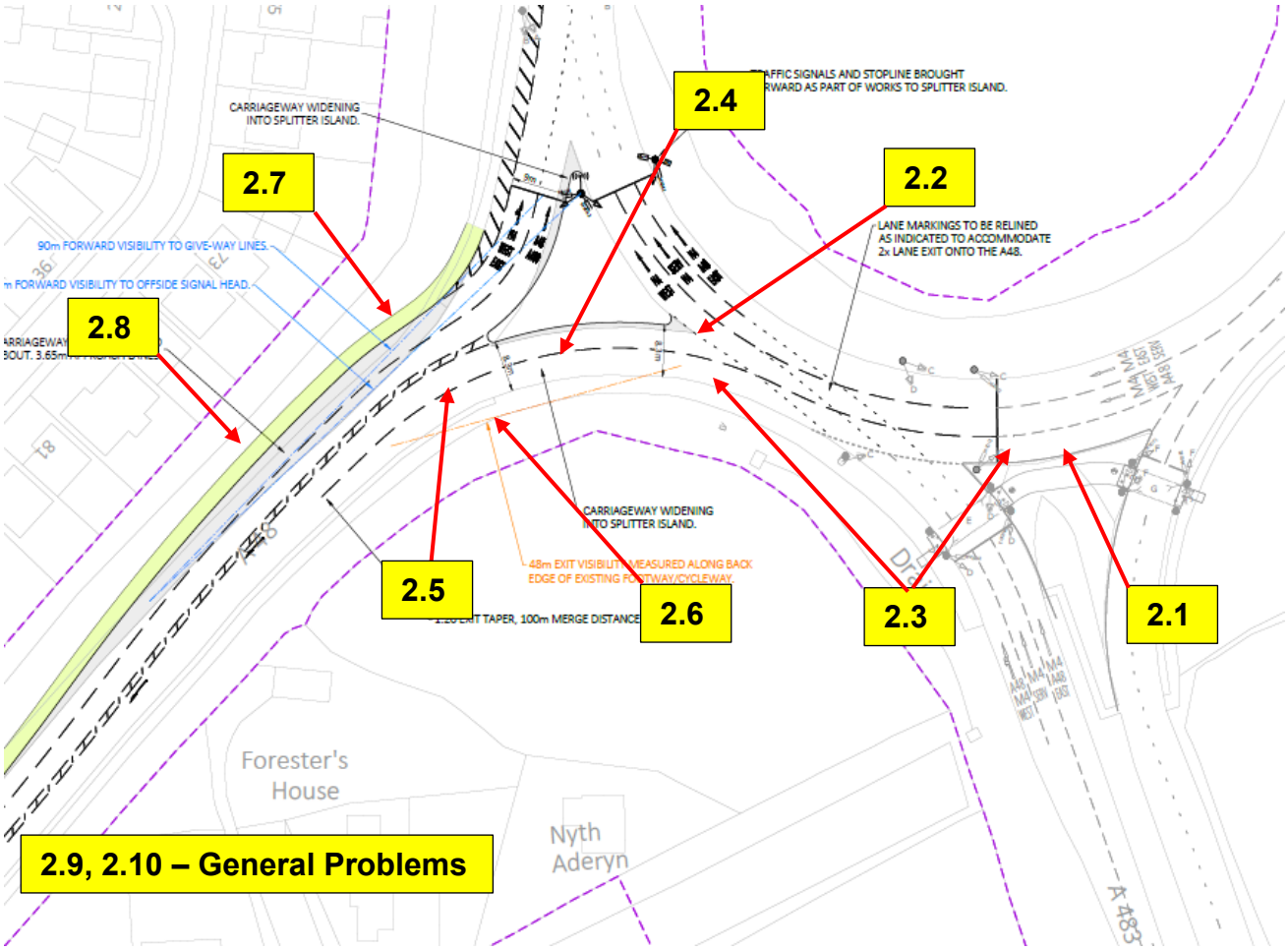
Drawings:

333700855-STN-XX-XX-DR-D-0001-P01 J47 A48 Improvements Option B, General Arrangement
333700855-STN-XX-XX-DR-D-0002-P01 J47 A48 Improvements Option B, Swept Paths

Documents:

Stage 1 Road Safety Audit report (ATSS ref. 250709, August 2025)

Appendix B – Key Plan showing Audit Problems



Appendix C – Site location plan

