

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

A477 Nash Fingerpost Junction Improvements

Stage 4 (12 month) Road Safety Audit

October 2016

Final Report




**A477 Nash Fingerpost Junction
Improvements
Stage 4 (12 month) Road Safety Audit
Final Report**

Service Provider/Consultant Name: Atkins

Service Provider/Consultant Project Number: JR15-911/8002-890

T-WHIS Number:

File Number:

	Name	Signature	Date
Author:	Rob Hunt		October 2016
Checked:	Francis Johns		
Reviewed:	Fraser Arnot		October 2016
Approved:	Rob Hunt		October 2016

Left blank intentionally

Contents

1	Introduction	6
1.1	Commission and Terms of Reference	6
1.2	Scope	6
2	Scheme Details.....	8
3	Analysis of Collisions	9
3.1	Severity and General Characteristics	9
4	Traffic Conditions.....	11
5	Review of Previously Raised Road Safety Audit Items.....	12
6	Conclusions	13
7	Road Safety Audit Team Statement	15
7.1	Audit Team Membership.....	15
8	Acceptance.....	16

APPENDIX A: LIST OF DRAWINGS AND DOCUMENTS

APPENDIX B: SCHEME DRAWING

1 Introduction

1.1 Commission and Terms of Reference

Atkins Transportation has been commissioned by the South Wales Trunk Road Agent (SWTRA) on behalf of the Welsh Government to undertake a 12-month Stage 4 Road Safety Audit of the previously installed improvements at the A477 Nash Fingerpost junction.

The Audit Team Membership has been approved by the Project Sponsor, Darryn Hill of Welsh Government, and was as follows:

Rob Hunt	BEng (Hons), MSc (Eng), CEng, MICE, MCIHT Audit Team Leader Managing Consultant Atkins Transportation
Fraser Arnot	BSc (Hons), MCIHT, CMILT Audit Team Member Principal Consultant Atkins Transportation

Mike James of SWTRA also participated in the site visit. The views of Dyfed Powys Police were also sought as part of the Road Safety Audit process. Rob Hunt and Fraser Arnot both hold a Highways England-approved Certificate of Competency in Road Safety Auditing (gained via the TMS Consultancy route).

This Stage 4 Road Safety Audit has been conducted with reference to the procedures and scope set out in the Welsh Government's 'Design Manual for Roads and Bridges' (DMRB), Volume 5, Section 2, Parts 2 and 3, 'Road Safety Audit' Standard HD 19/15.

1.2 Scope

The Road Safety Audit Brief was provided by Jon Robinson of Atkins Transportation on an email dated 10th October 2016. Details of the information provided as part of the brief are included in Appendix A.

Following an initial analysis of the collision data a site visit was deemed to be required in accordance with HD 19/15 paragraph 2.50. The criterium contained in HD 19/15 that prompted this conclusion was "where higher than expected numbers of personal injury collisions have occurred since the scheme became operational (when compared to control data)".

The Road Safety Audit comprised a desktop review of the information provided in the Road Safety Audit Brief and a subsequent site visit, which was carried out by the Road Safety Audit team during early afternoon on Wednesday 12th October 2016. Weather conditions at the time of the audit were dry and bright;

the road surface was also dry. Mike James of SWTRA also participated in the site visit.

The Nash Fingerpost Junction Improvement scheme on the A477 was previously subject of the following RSAs:

- Stage 1/2 Road Safety Audit in March and April 2014; and
- Stage 3 Road Safety Audit in February 2015.

The team has examined and reported only on the road safety implications of measures as presented and has not specifically examined or verified the compliance of the designs to any other criteria.

2 **Scheme Details**

The Road Safety Audit Brief provides the following scheme description:

As a part of this scheme, the A477 Nash Fingerpost junction was upgraded to a wide single lane dualling (WSLD) layout. In addition, provision was made for a shared use path (SUP) in the eastbound verge. The footpath tied into a future scheme for shared use path provision along the A477 between Slade Cross and Milton.

The works for this scheme comprised:

- Excavation of existing land and construction of a new verge adjacent to the eastbound carriageway.
- Widening of existing central reserve.
- Full depth carriageway construction in the eastbound direction where the carriageway is widened.
- Resurfacing of carriageway.
- Provision of a SUP adjacent to the eastbound carriageway.
- Relocation of existing highway drainage in the form of a filter drainage system adjacent to the SUP.
- Reconstruction of existing culvert under farm access.
- Installation of replacement signage at the junction.
- Translocation of existing hedge-bank adjacent to the eastbound carriageway.

Construction of the scheme was completed in December 2014.

3 Analysis of Collisions

3.1 Severity and General Characteristics

Collision data for the A477 Nash Fingerpost Junction Improvements scheme extents for the pre-scheme ('Before') and post-scheme ('After') periods were provided as follows. These periods exclude the construction period.

- Before (48 months): 1st January 2010 to 31st December 2013.
- After (12 months): 1st January to 31st December 2015.

The Before data was used to assist with deliberations regarding the need for a site visit.

During the After period between 1st January and 31st December 2015, a total of 2 personal injury collisions were recorded within the extents of the scheme, both of which resulted in slight injuries. This gives a killed or seriously injured (KSI) index of 0.

The first recorded slight injury collision occurred during the middle of the day on a Thursday in April 2015. A right-turning agricultural vehicle emerging from the A4075 side road failed to give way to a westbound car on the A477. The collision record indicates that the point of impact upon both vehicles was the front but the record also indicates that there was no skidding involved and the westbound car left the carriageway to the nearside. The road surface was dry, the weather was dry and there were no special conditions recorded.

The second slight injury collision occurred on a Friday evening in July 2015 at approximately 8pm. A right-turning car emerged from the A4075 side road and was struck in the offside by a westbound car on the A477. The collision record indicates that a low sun was possibly dazzling the westbound A477 driver. It also indicates that the driver emerging from the side road was very likely to have failed to look properly and possibly failed to judge the other (A477 westbound) vehicle's speed. Neither vehicle left the carriageway but the westbound A477 vehicle was recorded as skidding. The carriageway was recorded as being dry, the weather was dry and there were no special conditions recorded.

The average annual collision frequency of two collisions at the A477 Nash Fingerpost Junction in the 12-month After period was higher than the value predicted in the COBA Manual which predicts a collision frequency of 0.8 collisions per year based on the Annual Average Daily Traffic (AADT) shown in Section 4 for the A477 and A4075, taken from the Department for Transport traffic count website for Pembrokeshire.

A comparison of the key characteristics of the collision records for the Before and After periods at the A477 Nash Fingerpost Junction is summarised in the table. Collision totals in the Before period have been averaged to show annual rates for comparison.

Characteristic	Before (48 months)	After (12 months)	Change
Fatal	1 (0.25 per year)	0 (0 per year)	-0.25 per year
Serious	1 (0.25 per year)	0 (0 per year)	-0.25 per year
Slight	2 (0.5 per year)	2 (2.0 per year)	+1.5 per year
Total	4 (1 per year)	2 (2 per year)	+1 per year
Wet road surface and hours of darkness	1 (0.25 per year)	0 (0 per year)	-0.25 per year
Vehicle skidded	1 (0.25 per year)	1 (1 per year)	+0.75 per year
Powered two-wheeler	2 (0.5 per year)	0 (0 per year)	-0.5 per year
Light goods vehicle	1 (0.25 per year)	0 (0 per year)	-0.25 per year
Turning right from A4075 and failing to give way	4 (1 per year)	2 (2 per year)	+1 per year

There has been an increase in the total number of collisions per year in the After period compared with the average for the three years in the Before period. In addition there has been an increase in the number of collisions involving a right turning vehicle emerging from the A4075 failing to give way to a westbound A477 vehicle. This is the most common collision type in the Before and After period; two collisions in the Before period involved motorcycles although none were involved in the two collisions in the After period.

4 Traffic Conditions

The available Annual Daily Traffic (AADT) flow for the route is shown in Table 2 below.

SITE	2013		2014		2015	
	AADT	%HGV	AADT	%HGV	AADT	%HGV
<i>A477 west of Nash Fingerpost Junction</i>	9033	6.1	9067	6.0	9165	6.2
<i>A477 east of Nash Fingerpost Junction</i>	12872	6.7	12935	6.6	13111	6.8
<i>A4075 south of Nash Fingerpost Junction</i>	3870	14.4	3993	14.7	4103	14.8

5 Review of Previously Raised Road Safety Audit Items

There are no outstanding items from the Stage 1 and 2 Road Safety Audit (April 2014).

The first item raised as part of the Stage 3 Road Safety Audit undertaken in February 2015 related to limited visibility to the give way markings for eastbound A477 users entering the right turn lane. This has been addressed by the introduction of a vertical Give Way traffic sign. Tyre marks on the surface of the right turn lane indicate there has been sudden braking, possibly created by queuing vehicles requiring other to stop earlier than expected. However, it is not clear if these tyre marks pre-date the introduction of the sign.

The second item raised concerns for westbound users failing to understand the alignment of the main carriageway immediately downstream of the side road. The problem appears to have been addressed through changes to the road studs.

The final item in the previous Stage 3 Road Safety Audit related to the western end of the shared use path; this issue has been resolved by the recent construction of the next section of shared use path to the west of the junction.

6 Conclusions

There has been an increase in the annual recorded personal injury collision rate but there has been a fall in the overall severity of these collisions. In the three-year Before period there was one fatal collision and one serious collision (both involving motorcycles) and none in the After period. In both the Before and After periods there were two slight injury collisions.

Both collisions recorded in the After period involved a vehicle turning right from the A4075 into the path of a westbound A477 which was also the most common collision type in the Before period. The police records indicate that driver error was likely to be responsible for both collisions, with one of the collisions also apparently involving the westbound A477 user being affected by driving towards a low evening sun. Only one of the Before collision records and none of the After collision records indicate that excessive speed was a factor.

The collision records do not directly indicate a problem with the changes to the junction layout. However, the layout has been reviewed with reference to the recorded collisions and the following items were noted:

- The junction is located at a section of the A477 where there is a combination of horizontal and vertical curvature ie westbound vehicles do not approach the junction in a straight line. It is possible that this can make it more difficult for users emerging from the A4075 to judge the speed of these vehicles, which is a problem that might be expected at a single lane dualling junction.
- Due to westbound users approaching the junction on a right hand bend, when a vehicle enters the left turn lane to leave the A477 towards the A4075 it can obscure other vehicles behind it. Whilst the following vehicle(s) may only be obscured for a short time, it is possible that some users emerging from the A4075 do not fully observe all of the approaching vehicles.
- There seems to have been very little change to the alignment and view to the right for users emerging from the A4075 and turning right when comparing the previous layout to the current layout. However, priority over users turning right into the A4075 has been clarified in accordance with the design standard TD 42/95 Design of Major/Minor Priority Junctions.

During the site visit several other points of interest were noted regarding driver behaviour at the junction:

- A car transporter accessing the Vauxhall garage in the direction of Milton was observed to undertake a complicated and non-standard U-turn manoeuvre including travelling the wrong direction through the exit onto the A4075 (see Appendix B) blocking the junction and creating potential conflicts with five different traffic movements at the junction. This led to queues of vehicles waiting to turn off the A477 in both directions. The manner in which the manoeuvre was carried out suggested this was regular practice.

- Several instances of an informal change of priority for right-turning vehicles were observed when users turning right from the A4075 indicated they were giving priority to users turning right from the A477.
- There are numerous different tyre marks on the carriageway, presumably created by sharp turning or heavy braking movements. Many of these marks are in areas where vehicle movements would be expected but a significant proportion are in areas and directions that are at odds with normal operation of the junction. This suggests that there are unpredictable vehicle movements occurring at the junction.

All of these items indicate that driver behaviour – and particularly unusual/unexpected actions – are likely to have an impact upon the operation of the junction.

The most common collision type at the junction has not changed and this is mirrored by the relatively minor changes to the alignment and layout of the section of the junction affecting this collision type.

7 Road Safety Audit Team Statement

We certify that this Road Safety Audit has been carried out in accordance with HD 19/15.

7.1 Audit Team Membership

Audit Team Leader

Rob Hunt
Managing Consultant
Atkins Transportation

Signed:



Date:

October 2016

Audit Team Member

Fraser Arnot
Principal Consultant
Atkins Transportation

Signed:



Date:

October 2016

Others Involved in the Road Safety Audit

Mike James
South Wales Trunk Road Agent

8 Acceptance

This part to be signed by the Welsh Government Project Sponsor.

In connection with the Stage 4 (12 month) Road Safety Audit prepared for the A477 Nash Fingerpost Junction Improvements Scheme, I acknowledge receipt of this report.

Signed:

Date:

Name:

Position:

APPENDIX A: LIST OF DRAWINGS AND DOCUMENTS

The Stage 4 (12 month) Road Safety Audit Brief included:

DOCUMENTS:

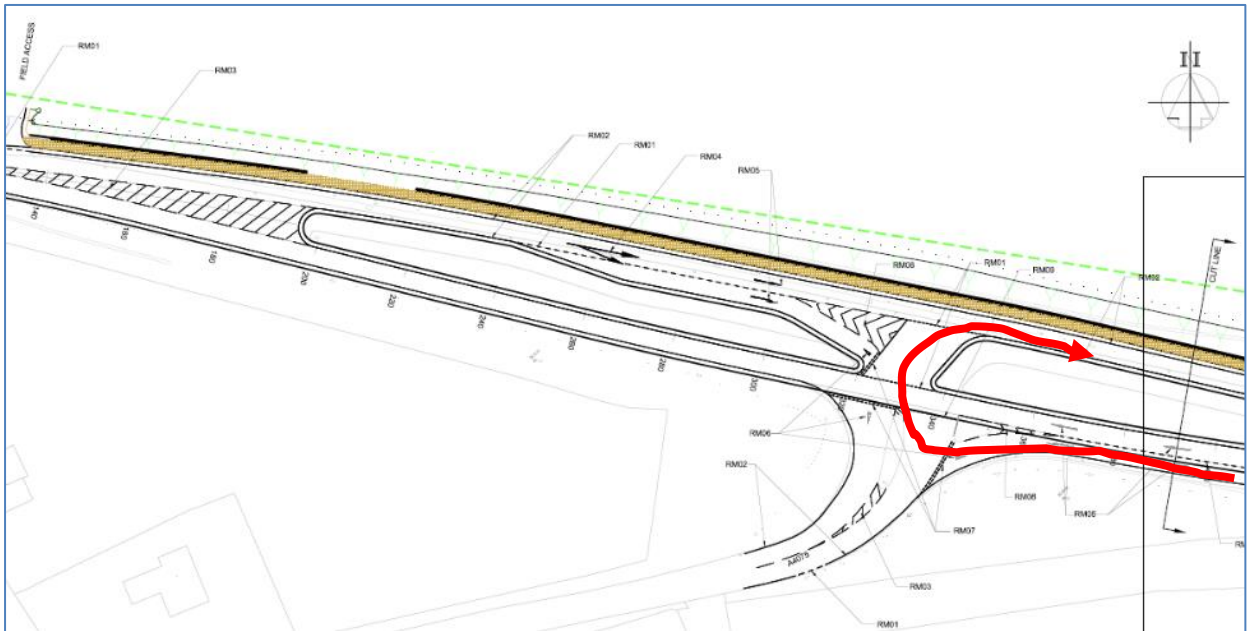
Email dated 10th October 2016
Stage 4a Road Safety Audit Brief
Brief

Jon Robinson to Hywel Davies
A477NFP.ATK.008.DO.001-RSA4

DRAWINGS:

A477NFP-ATK-001-DR-501 Rev A	Drainage Drawing
A477NFP-ATK-001-DR-601 Rev A	Earthworks Drawing
A477NFP-ATK-001-DR-701 Rev A	Pavement Drawing
A477NFP-ATK-001-DR-1101 Rev A	Kerbs and Footways Drawing
A477NFP-ATK-001-DR-1201 Rev A	Road Markings
A477NFP-ATK-001-DR-1202 Rev A	Signs Drawing

APPENDIX B: SCHEME DRAWING



Path of transporter vehicle observed by the Audit Team is shown by the red arrow



South Wales Trunk Road Agent
Asiant Cefnffyrdd De Cymru

Unit 12A, Llandarcy House
The Courtyard, D'Arcy Business Park
Llandarcy, Neath. SA10 6EJ

www.southwales-tra.gov.uk