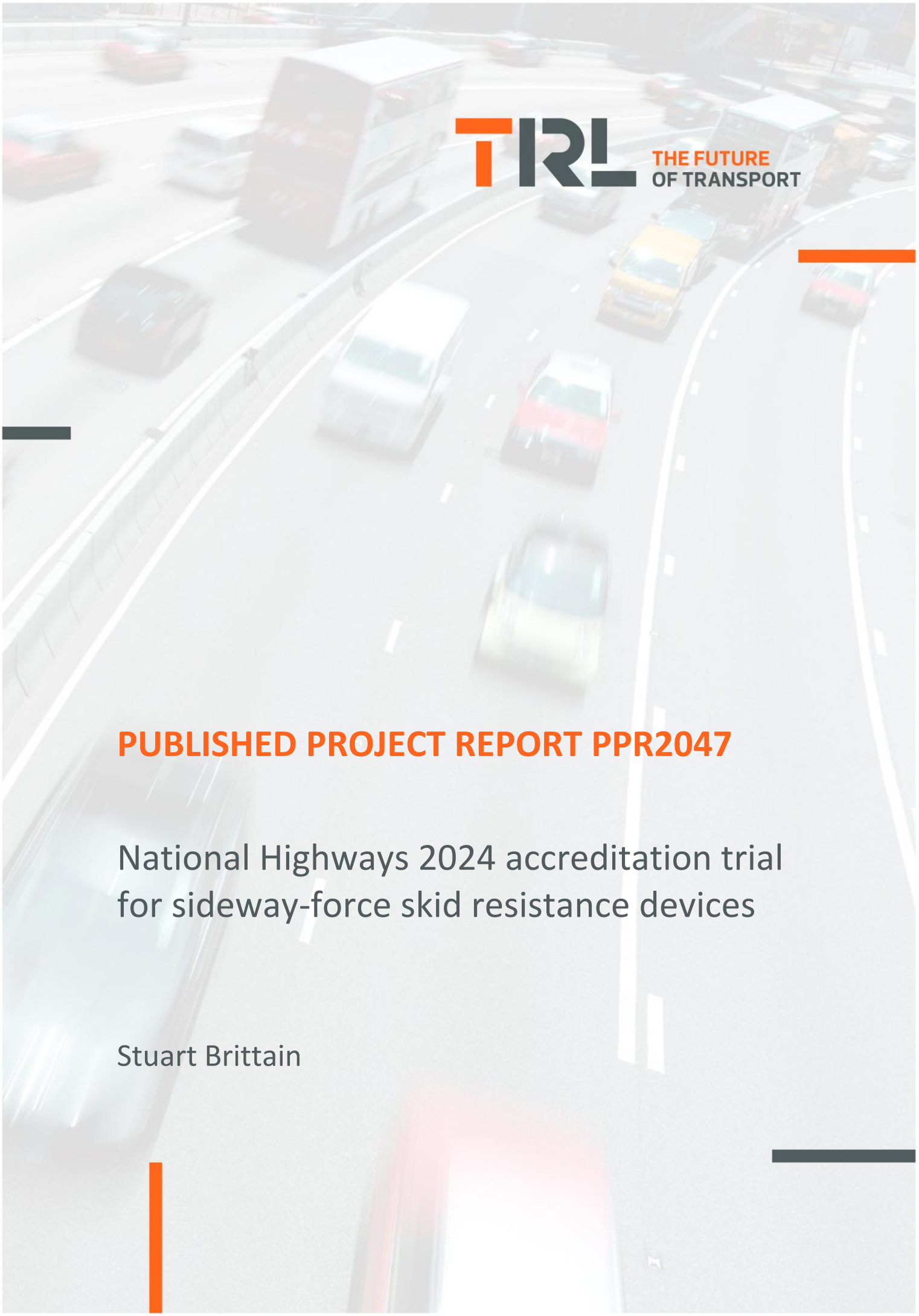

THE FUTURE OF TRANSPORT

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National Highways 2024 accreditation trial for sideway-force skid resistance devices

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Executive Summary

The national accreditation for sideway-force skid resistance devices is organised annually by TRL, on behalf of National Highways. The purpose of this accreditation is to verify the performance of all sideway-force skid resistance devices operating on the UK trunk roads so that consistency is maintained throughout the fleet. The measurements by these machines are used to monitor the skid resistance of the motorway and trunk road network in support of National Highways skidding resistance standard (DMRB CS 228). By examining the results from the machines operating on specified test sections it is possible to assess the performance of individual machines and the consistency of the whole UK fleet.

The 2024 accreditation trial was held during the week beginning 22nd April 2024. Eighteen machines attended, including one machine that operates in the USA.

The following principal conclusions were drawn in relation to the mandatory tests and assessments:

- All eighteen machines were found to be satisfactory with regards to the machine being in good general mechanical order and test wheel weight.
- All eighteen machines met the criteria for the skid resistance measurements.
- All eighteen machines met the criteria for vehicle speed.
- Fifteen of the eighteen machines met the criteria with regards to the measurement of distance during the trial. Following further testing/review the remaining three machines were also found to be acceptable.
- All eighteen machines provided satisfactory water flow rate and direction.

The following principal conclusions were drawn in relation to the various additional tests and assessments:

- All eighteen machines are fitted with 3-dimensional spatial coordinate systems and were assessed for the measurement of OSGRs. Eight machines achieved a high performance, two a medium, five a low and three not suitable.
- All eighteen machines are fitted with 3-dimensional spatial coordinate systems and were assessed for the measurement of altitude. One machine achieved a high performance, seven a medium, seven a low and three not suitable.

Overall, the trial demonstrated that the UK fleet continues to perform at a level suitable for use in supporting the implementation of the skid resistance standard.

1 Introduction

The 2024 sideway-force skid resistance accreditation trial was held on behalf of National Highways, during the week commencing 22nd April 2024. The trial is funded by National Highways, supported by participant fees for each machine attending, paid for by the survey contractors/operators of the machines.

The trial was held on the HORIBA-MIRA proving ground (referred to as MIRA in the rest of this report) and on two Network routes. Seventeen machines based in the UK and Ireland and one machine based in the USA attended.

The purpose of the trial is to verify the performance of all sideway-force skid resistance devices operating on the UK trunk road network so that consistency is maintained throughout the fleet. This is important because the results of measurements by these machines are used to monitor the motorway and all-purpose trunk road network in support of the National Highways skidding resistance standard (DMRB CS 228).

By examining the results from the machines operating on specified test sections, it is possible to assess the performance of individual machines and the consistency of the whole UK fleet.

TRL has been responsible for planning and running the accreditation trials since 1995. The 2024 trial comprised seven general stages:

1. **Preparations**: During the days immediately preceding the trial, the test track, documentation and support facilities were checked and made ready. Operators were required to undertake weighing of their own test wheel assembly and vertical calibrations before the trial.
2. **Ordnance Survey Grid Reference (Crowthorne network route)**: Machines with OSGR systems fitted undertook surveys of the Crowthorne network route, either before or after the testing at MIRA, for the assessment of their OSGR systems.
3. **Waterflow, speed and distance (MIRA)**: Machines were inspected to check the performance of the water flow control. Operators were given an opportunity to undertake a distance calibration of their machine. Laps were undertaken on the Twin Straights, with timing gates set up over one section on the site. Data from this testing were used to assess the distance and speed measurements of the machines.
4. **Skid Resistance measurements (MIRA)**: Laps were undertaken of the Straight Line Wet Grip (SLWG) facility at MIRA to provide initial indication of performance with regards to skid resistance measurements.
5. **Machine alterations**: Operators were provided with feedback on the performance of their machines after the first set of testing on the SLWG. This information was used by the operators to make alterations to the machines, if required, before the remaining testing in the trial.
6. **Testing of network route near MIRA**: Laps were undertaken of the network route near MIRA. This data was used to support the skid resistance assessment on the SLWG and the OSGR assessment on the Crowthorne network route.

7. **Repeat test track skid resistance measurements**: The SLWG testing was repeated to assess fleet variability and the performance of devices following any required alterations arising from Stage 5.

The results from the testing described above are discussed in this report and are provided in the accreditation certificates issued to the trial participants. These certificates are also accessible on the UKRLG website in the road condition information area at:

https://ukrlg.ciht.org.uk/ukrlg-home/guidance/road-condition-information/data-collection/skid-resistance/

For convenience, throughout this report machines are referred to using the running number assigned at the trial. For ease of comparison, machines usually retain the same running numbers from one year to the next. To avoid confusion with earlier vehicles, when a machine is replaced or re-built on a new chassis, the new vehicle is assigned a new running number in sequence when it first appears at the trials. Appendix A lists all the machines, their running numbers (ID) and their operating organisations as they were in April 2024.

Sometimes machines are unable to attend the main trial, or problems are identified that cannot be resolved during the main trial. If machines do not attend or fail to pass the main trial then an additional trial will be required to achieve accredited status which must be fully funded by the machines' owners.

2 Pre-trial preparation

2.1 Test wheel assembly weighing and vertical calibrations

Survey contractors were asked to weigh their test wheel assemblies and conduct a vertical calibration before the trial. This data was provided to TRL before arriving on site at MIRA. The test wheel assembly weights are discussed in section 4.1.

2.2 Test tyres

Small variations in skid resistance measurements can sometimes be caused by differences between test tyres fitted to different machines. The tyres used for this trial were all purchased as new in 2024. Before the trial TRL carried out surveys on the A329m with each of these tyres to check the batch consistency. The data from the tyres to be used was found to be suitable for the trial.

2.3 Site Preparation

Prior to the trial, a drive through of the network routes was undertaken to identify if there could be any issues with using the routes (e.g. roadworks) or any aspects that may need to be considered when assessing the data collected (e.g. road deterioration or recent maintenance). During this inspection it was found that the skid values on the route remained suitable and no roadworks were in place or signs announcing imminent works.

The parts of the MIRA proving ground used in the trial were prepared leading up to the trial. The reference points at the start of each test length were identified using cones and the track was visually inspected.

There is always an element of variability in the skid resistance measurements that is a result of drivers following slightly different driving lines in each survey run. This manifests itself both in variation between runs with the same driver and in different general lines followed by different drivers. To reduce the variability on the Straight Line Wet Grip test site, cones are placed either side of the lane to create a corridor for the machines to travel within. However, the cones have to enable testing with the largest vehicle and also provide some leeway so that cones are not hit on a regular basis. Therefore, although this approach may reduce the driving line variability, some may still remain. Due to the higher speed testing on the Twin Straights, it has been deemed unsuitable to apply the same approach there.

3 Test sections

The trial uses two areas of the MIRA proving ground (the Twin Straights and the Straight Line Wet Grip Area), along with a network route in the surrounding area. In addition, a second network route has been established near to TRL's head office in Crowthorne, Berkshire for the assessment of OSGR/Altitude measurement systems.

3.1 Twin straights

This area is used for distance calibration, the location referencing tests (including speed measurement), and for skid resistance testing. The overview of the Twin Straights and the position of the marker points A-G are given in Figure 3.1.

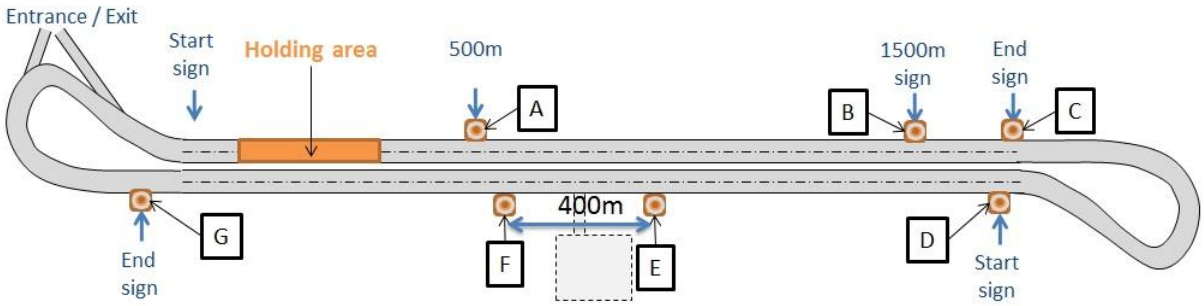

Figure 3.1: Overview of Twin Straights and position of marker points

The skid resistance data between markers E and G is used to support the findings from the SLWG and network route testing if required. The position of test sections on this length is shown in Figure 3.2. Details of the surfaces are given in Table 3.1.

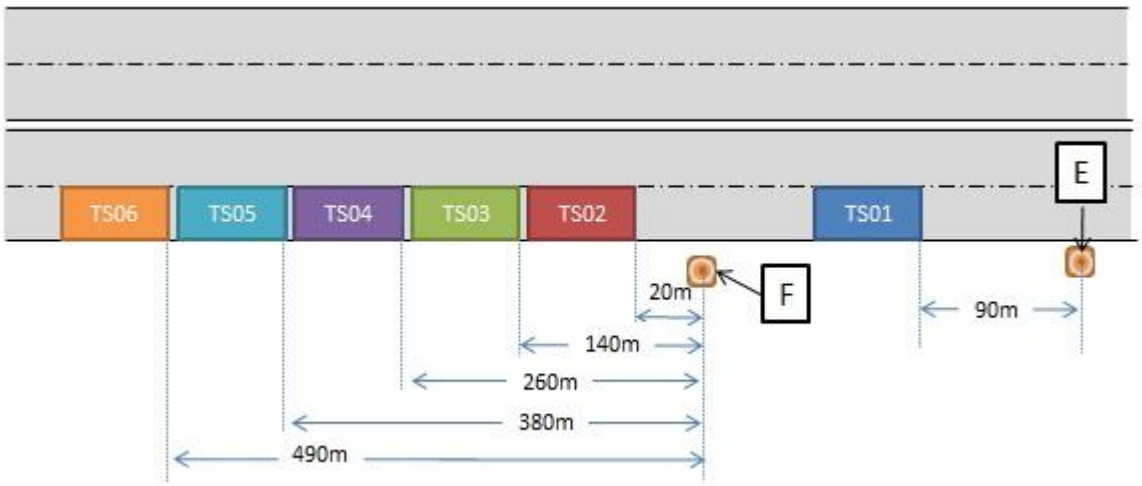

Figure 3.2: Skid resistance test sections on Twin Straights

Table 3.1: Skid resistance test sections on Twin Straights

Section	Length (m)	Surface description
TS01	130	Normal track surface, thin surfacing applied in October 2013.
TS02	100*	A proprietary thin surfacing material using 6 mm coarse aggregate and polymer-modified bitumen. The small-size particles are closely packed and the texture is formed by large numbers of relatively narrow and shallow gaps between them. This type of surfacing generates very low levels of traffic noise but it has a relatively lower texture depth (compared with other thin surfacings with coarser aggregates). Laid in October 2010.
TS03	100*	A proprietary thin surfacing material using 10 mm coarse aggregate and a fibre-reinforced bitumen. This is typical of low-noise asphalt materials laid on many roads. Laid in October 2010.
TS04	100*	A proprietary thin surfacing material using 14 mm coarse aggregate. It has a rather more open grading, and hence greater texture depth, than the surfacings with the smaller aggregate. Laid in October 2010.
TS05	50*	A hot-rolled asphalt mat into which 20 mm chippings that have been lightly pre-coated with bitumen are rolled while the asphalt is still hot. This is the "traditional" material used commonly on UK main roads until the introduction of thin surfacings from about 1990. Laid in October 2010.
TS06	100	Normal track surface, thin surfacing applied in October 2013.

* The trial lengths are shorter than each surfacing so as to exclude the transitions between the different surfaces.

3.2 Straight Line Wet Grip area

The Straight Line Wet Grip (SLWG) area on the MIRA proving ground is utilised to provide lengths with a range of skid resistance levels including some particularly low values not present on the network route. The position of the sections is given in Figure 3.3 and details of the sections are given in Table 3.2.

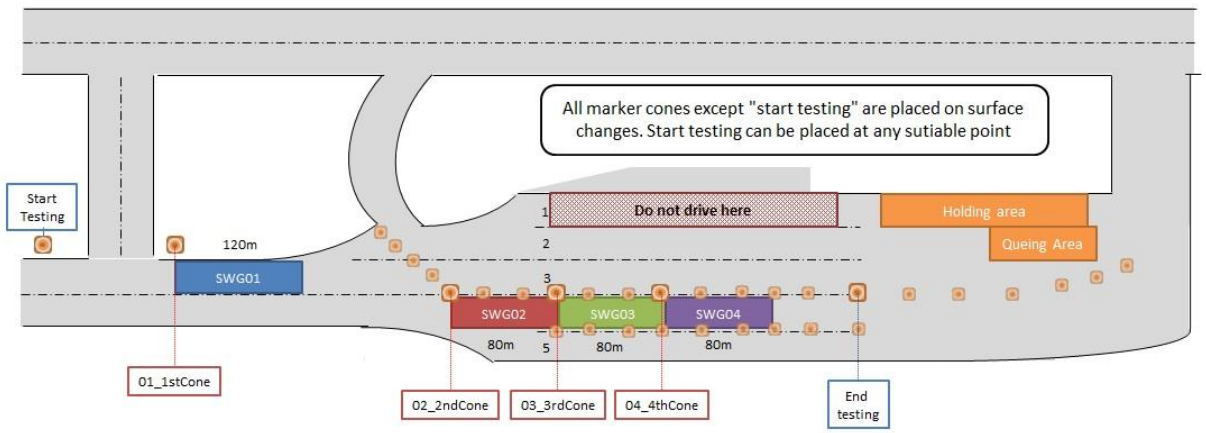

Figure 3.3: Skid resistance test sections on the Straight Line Wet Grip area

Table 3.2: Skid resistance test sections on the Straight Line Wet Grip area

Section	Length (m)	Surface description
SWG01	100	Transverse grooved Portland cement concrete
SWG02	60*	Worn bitumen macadam
SWG03	60*	Bridport gravel (with quartzite) exposed aggregate concrete
SWG04	60*	Smooth asphalt concrete

* The trial lengths on the wet grip area did not include the full length of each surfacing in order to exclude the transitions between the different surfaces.

3.3 Network route to Sheepy Magna (near MIRA)

A network route is included in the accreditation trial to provide supporting data for the assessment of skid resistance and location referencing. The first marker of the route is at the roundabout exit directly outside of the MIRA site, the route then loops round to Sheepy Magna and returns to MIRA as shown in Figure 3.4 (Contains Ordinance Survey data © Crown copyright and database right 2024). Details of the route are given in Table 3.3.

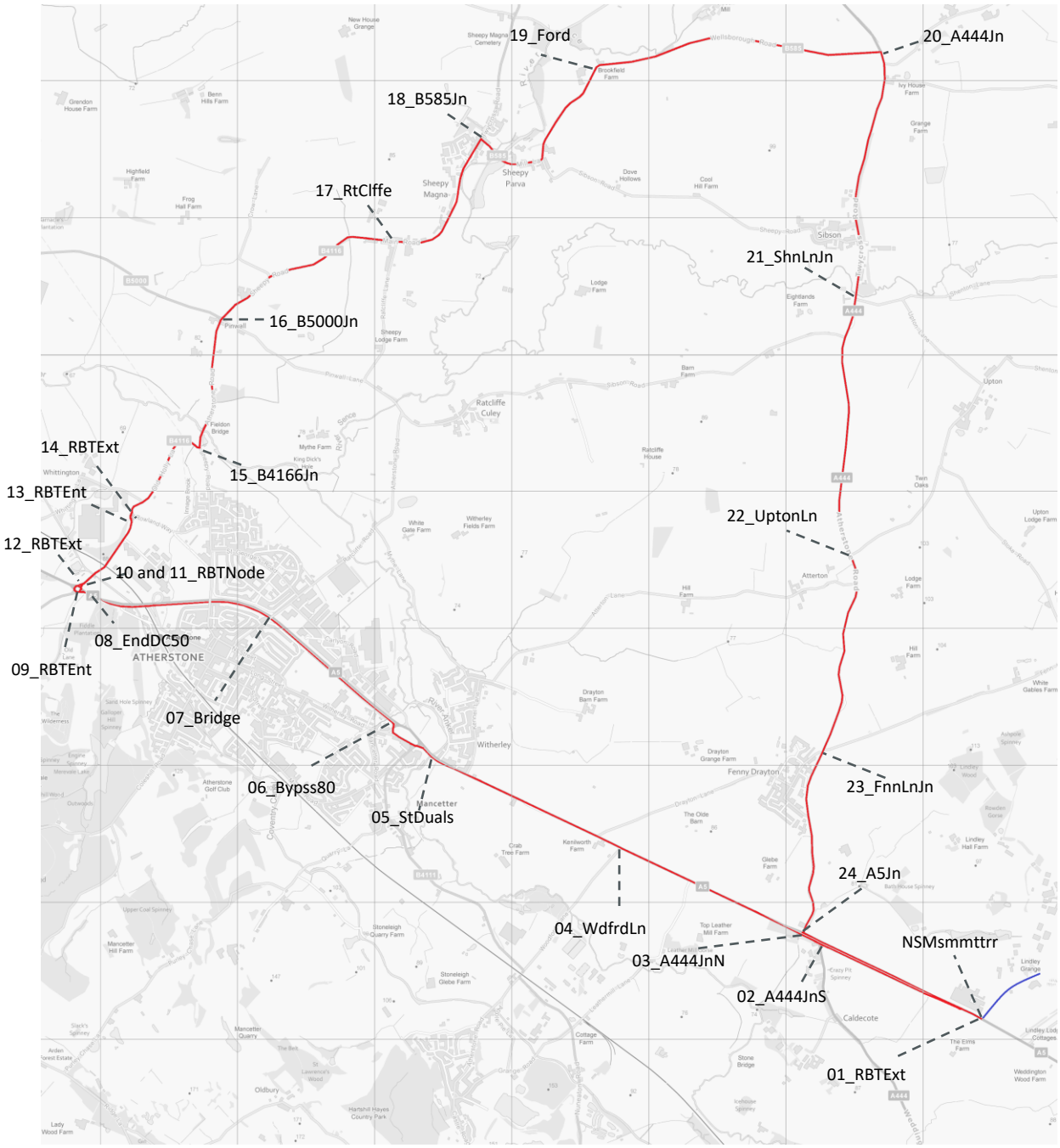

Figure 3.4: Network route to Sheepy Magna

Table 3.3: Details of network route, including marker positions

Survey distance (km)	Section length (m)	Markers	Marker position	Driving Instructions
n/a	n/a	NSMsmmttrr	Entry to MIRA roundabout	Turn right at the MIRA exit roundabout (A5 WB)
0	1260	01_RBTExt	Node at exit of MIRA roundabout	Continue on A5, testing in Lane 1
1.26	192	02_A444JnS	Node at entry to gyratory at junction with A444 south	Continue on A5
1.45	1454	03_A444JnN	Node at exit of gyratory at Junction with A444 North	Continue on A5
2.91	1379	04_WdfrdLn	Node at centre of Junction with Woodford Lane (has sign for Dobbie's Garden world)	Continue on A5
4.28	543	05_StDuals	Start of duals	Dual carriageway commences. Take right lane and continue to second exit on to A5 Atherstone by-pass towards Tamworth.
4.83	1199	06_Bypss80	Mancetter circulatory system exit	Return to testing on Lane 1 for exit of circulatory system on to A5.
6.03	1249	07_Bridge	Centre of 1st road bridge going over A5	Continue on A5
7.28	178	08_EndDC50	Node at end of dual carriageway	Continue testing for approx. 200m on approach to roundabout
7.45	128	09_RBTEnt	Entry to roundabout junction with B4116	Test roundabout as per CS 228
7.58	147	10_RBTNode	Roundabout "Node"	Continue survey of roundabout
7.73	111	11_RbtNode	Roundabout "Node"	7.73
7.84	640	12_RBTExt	Roundabout exit	Take exit, B4116 towards Twycross.
8.48	30	13_RBTEnt	Roundabout (access to Aldi distribution depot)	Take second exit (straight on)
8.51	836	14_RbtExt	Roundabout exit	Continue testing on B4116
9.35	970	15_B4166Jn	At T-junction	Turn left and continue testing on B4116 towards Twycross
10.32	1486	16_B5000Jn	Junction with B5000 (on left) at the Red Lion	Continue testing on B4116
11.80	1100	17_RtClffe	Centre of junction with Ratcliffe Ln (on right)	Continue on B4116 and enter Sheepy Magana
12.90	1333	18_B585Jn	At exit of T-Junction	Turn right on to B585 (Mill Lane) towards Market Bosworth.
14.24	2108	19_Ford	Centre of junction with signpost for ford.	Continue on B585
16.34	1847	20_A444Jn	At junction with A444	Turn right onto A444 towards Nuneaton.
18.19	1910	21_ShnLnJn	At Junction with Shenton Lane (signposted Upper Shenton)	Continue on A444
20.10	1476	22_UptonLn	At junction with Upton Lane (on left, is signposted for Upton)	Continue on A444
21.58	1385	23_FnnLnJn	At junction with Fenn Lanes (on left, is signposted for Bosworth Battlefield)	Continue on A444
22.96	n/a	24_A5Jn	Centre of A444/A5 Junction	Turn left on to A5 towards Hinkley. Continue along the A5. On dual carriageway in Lane 1 This marks the end of the route.

Fourteen 100m lengths of varying skid resistance levels are selected from various locations along the network route for the analysis. These lengths have been selected for homogeneity of skid resistance within the length and low indications of variation due to test line. As parts of the route may be maintained between accreditation trials, the lengths used in the analysis are reviewed in each accreditation trial and modified as necessary. Therefore, the locations of these lengths (and the typical skid resistance values) may vary between trials.

3.4 Crowthorne network route

To support the robust assessment of the OSGR and Altitude systems, a network route site has been established close to TRL's head office in Crowthorne (Berkshire). This site includes significantly more tree coverage than the MIRA network route (discussed in section 3.3) and also features retro-reflective marker posts for the automatic detection of section start and end points. Only machines which are having their OSGR and Altitude systems assessed test this route.

The Crowthorne route is located on the B3430 between the A3095 and A322 (in both directions). An overview of the eastbound and westbound routes is shown below in Figure 3.5 and Figure 3.6 respectively. Details of the marker positions are given in Table 3.4 and Table 3.5 (Contains Ordinance Survey data © Crown copyright and database right 2024).



Figure 3.5: Eastbound direction of Crowthorne network route



Figure 3.6: Westbound direction of Crowthorne network route

Table 3.4: Section Identifiers for Eastbound direction of Crowthorne network route

Section Start Identifier and Description	Section Length (m)	Start Easting	Start Northing	Section Identifier
Start to A - Run in before the Golden Retriever junction (B3430/A3095).	>200m	N/A	N/A	Run-in
A to B – B3430 Nine Mile Ride (Start is by double-triangle warning sign)	596m	485723.3	166084.9	AB
B to C – After first right-hand bend, near to final black and white reflective road edge marker as corner straightens	336m	486307.5	166170.4	BC
C to D – Prior to first left hand bend, marker is just before change to high friction surfacing	709m	486631.6	166057.7	CD
D to E – Prior to left-hand bend warning triangle sign (with yellow background)	388m	487335.0	166133.8	DE
E to Run out – After arrow for right turn lane (opposite road sign on right-hand side)	>200m	487711.7	166248.5	Run-out

Table 3.5: Section Identifiers for Westbound direction of Crowthorne network route

Section Start Identifier and Description	Section Length (m)	Start Easting	Start Northing	Section Identifier
Start to F - Run in B3430 Nine Mile Ride from A322 junction.	>200m	N/A	N/A	Run-in
F to G – At arrow for right turn lane (road sign on Left-hand side)	400m	487714.8	166241.4	FG
G to H – After reverse of sign on left hand side	702m	487335.9	166131.2	GH
H to I – After second right hand bend, marker is just after change to high friction surfacing	337m	486631.1	166054.9	HI
I to J – Prior to left hand bend, marker is before the change to high friction surfacing	589m	486309.3	166166.8	IJ
J to Run out – B3430 Nine Mile Ride (Marker is opposite previous double-triangle warning sign)	>200m	485735.8	166084.5	Run-out

4 Machine inspections

4.1 Left test wheel weight checks

As discussed in section 2.1 the survey contractors were asked to weigh the test wheel assemblies on their machines and provide the data before the trial. The results of these measurements are given in Table 4.1.

Table 4.1: Test wheel weights

ID	Un-bounced 1	Un-bounced 2	Un-bounced 3	Un-bounced Mean	Bounced 1	Bounced 2	Bounced 3	Bounced Mean
3	198.5	198.0	198.5	198.3	200.0	200.0	200.0	200.0
13	199.0	199.0	199.5	199.2	202.0	201.5	201.5	201.7
16	196.5	197.5	197.4	197.1	202.6	204.3	204.5	203.8
17	201.0	201.0	201.0	201.0	203.0	203.0	203.0	203.0
19	199.0	199.0	199.0	199.0	202.0	203.0	203.5	202.8
21	197.5	197.5	197.5	197.5	198.5	198.5	198.5	198.5
22	197.4	196.8	197.1	197.1	200.4	200.2	200.5	200.4
23	200.5	200.5	200.5	200.5	201.5	201.5	201.5	201.5
24	197.5	197.5	197.5	197.5	201.0	201.0	201.0	201.0
25	198.0	197.5	197.5	197.7	202.0	202.5	203.0	202.5
26	197.5	198.0	198.0	197.8	202.5	202.5	203.5	202.8
28	196.5	196.0	196.0	196.2	200.0	200.0	200.5	200.2
29	204.4	205.5	204.9	204.9	204.3	205.3	204.5	204.7
31	201.0	201.0	201.0	201.0	201.5	202.0	202.0	201.8
33	205.5	205.5	205.5	205.5	206.0	205.5	206.0	205.8
35	206.5	206.5	205.5	206.2	207.5	207.5	207.5	207.5
37	200.5	200.5	200.5	200.5	203.0	203.0	203.0	203.0
38	194.7	194.0	195.4	194.7	200.4	200.2	200.5	200.4

It can be seen in Table 4.1 that all of the “bounced” mean weights of the machines fell within the tolerances given in Appendix D.

In 2009, British Standards published a CEN Technical Specification for these devices (BSI, 2009). This is a Draft for Development (DD) document that can be used voluntarily over a period so that experience can be gained before being accepted and introduced (if appropriate) as a full EN (European Norme). This is one of a series of documents for skid resistance measurement devices intended to encourage consistent standards in the use of similar machines in different European countries. The requirements in this document may be incorporated into future revisions of the British Standard.

This DD was developed from BS 7941-1 (BSI, 2006) so it is already largely consistent with current UK practice. However, some aspects were revised to take account of wider experience of the use of similar devices in Europe and one of these is the reduction of the tolerance for static wheel weight to ±1 kg.

At this trial, all of the machines were within the current ±8 kg tolerance. However, had the CEN TS requirement been applied to the fleet this year, thirteen machines would have been

outside the ±1 kg tolerance. However, it is noted that all devices that attend this trial incorporate measurement of dynamic vertical load in the processing of the survey data. Therefore, the need to tighten the criteria may not be required. These aspects have been raised with the relevant CEN committee.

4.2 Water flow rate checks

After minor adjustments to some machines, it was deemed that all machines had satisfactory water flow rates and direction of flow.

4.3 Vertical and horizontal load calibration

Operators were asked to arrive on site with the machines having had a recent vertical calibration. The crews were also asked to conduct a horizontal calibration at the start of each day of testing that involved collection of skid resistance measurements.

4.4 Distance calibration

All crews undertook a distance calibration check of their machine on a defined length at the test site.

4.5 Speed

The assessment of speed (both the attainment of the target speed and the accurate recording of speed in the survey data) was carried out using data collected during the tests on the Twin Straights. Testing on this site was undertaken such that at least three passes at 50km/h were achieved for each machine. Historically, all machines would also collect data at 80km/h. However, due to disruption caused by one of the operators arriving late, it was not possible to complete the 80km/h testing for all devices. Therefore, to maintain a consistent assessment across all the fleet, only the 50km/h data has been used in the assessment.

The time taken for the machines to travel between markers E and F on the Twin Straights, along with the distance between these two markers, was used to determine an independent measure of the average speed of the machines over this length. The elapsed time was recorded using a set of timing gates which recorded the time, in seconds, to 2 decimal places.

The differences between the speed reported in the survey data and the independent measurement are shown in Table 4.2. The differences between the independent measure and the target speed are shown in Table 4.3. Instances where the value exceeds the criteria levels in Appendix D are highlighted in bold red text. Instances where a measurement was not made (or did not include suitable marker detection) are shown as ".".

Table 4.2: Difference between speed recorded in data and independent measure (km/h)

ID	50km/h Run 1	50km/h Run 2	50km/h Run 3	50km/h Run 4	50km/h Run 5	% within criterion
3	0.40	0.41	0.40	0.38	0.38	100%
13	-0.13	-0.15	-0.15	-0.15	-0.15	100%
16	.	-0.71	-0.72	-0.71	-0.72	100%
17	-0.05	-0.05	-0.07	-0.09	-0.07	100%
19	0.24	-0.10	.	0.25	0.31	100%
21	-0.74	-0.85	-0.85	-0.87	-0.88	100%
22	0.05	0.03	0.02	-0.01	0.01	100%
23	0.22	0.22	0.25	0.16	0.22	100%
24	-0.22	-0.32	-0.07	-0.19	-0.14	100%
25	0.09	0.22	0.17	0.14	0.20	100%
26	.	0.20	0.06	0.20	0.22	100%
28	.	0.09	-0.10	-0.22	.	100%
29	-0.28	-0.11	-0.21	-0.69	.	100%
31	.	0.19	0.34	0.34	.	100%
33	0.07	0.06	0.02	0.00	0.33	100%
35	-0.01	0.14	0.48	0.46	0.00	100%
37	-0.08	-0.03	-0.09	-0.04	-0.06	100%
38	-0.16	-0.20	-0.29	-0.28	-0.25	100%

Table 4.3: Difference between independent measure and target speed (km/h)

ID	50km/h Run 1	50km/h Run 2	50km/h Run 3	50km/h Run 4	50km/h Run 5	% within criterion
3	-0.41	-0.41	-0.40	-0.38	-0.38	100%
13	-0.87	-0.85	-0.85	-0.85	-0.85	100%
16	-0.29	-0.29	-0.28	-0.29	-0.28	100%
17	0.05	0.05	0.07	0.09	0.07	100%
19	-1.24	0.10	-0.94	-1.25	0.69	100%
21	0.81	0.85	0.85	0.87	0.88	100%
22	-2.14	-2.13	-2.13	-2.10	-2.11	100%
23	-0.85	-1.95	-0.99	-0.82	-0.95	100%
24	-0.90	-0.75	**-3.32**	-1.05	-1.81	80%
25	-1.77	-2.14	**-3.00**	-2.46	-1.90	80%
26	-0.33	-0.52	-0.55	-0.34	-0.52	100%
28	.	-0.75	-0.75	-0.75	.	100%
29	-0.94	-1.04	-0.84	-0.77	-1.25	100%
31	-0.40	-0.36	-0.36	-0.34	.	100%
33	-0.07	-0.03	-0.02	0.00	-0.33	100%
35	-0.09	-0.24	-0.48	-0.46	0.00	100%
37	-0.60	-0.58	-0.57	-0.57	-0.55	100%
38	-1.55	-1.53	-1.52	-1.50	-1.48	100%

From Table 4.2 it can be seen that all eighteen machines achieved 100% of their runs within the criterion for the difference between the data recorded in the survey and the independent measure. In addition, from Table 4.3 it can be seen that all eighteen machines achieved at least 80% of their runs within the criterion for the difference between the independent measure and the target speed.

Therefore, all machines were deemed acceptable with regards to measurement of survey speed.

5 Skid resistance measurements

Skid resistance measurements area typically taken on three sites (Twin Straights, Straight Line Wet Grip, and the network route near MIRA). The data collected from the Twin Straights is not used as a primary site for the assessment and is normally used to provide supporting evidence to the assessments undertaken on the other two sites. However, as discussed in section 4.5 it was not possible to complete the 80km/h testing for all devices on the Twin Straights. In addition to this, one machine could not collect skid resistance measurements during the 50km/h testing and it was observed that the driving lines taken on the site noticeably differed between devices. The skid resistance data for the Twin Straights was reviewed and it was decided based on these reasons that it would be disregarded in subsequent analyses. As such, only skid resistance data from the Straight Line Wet Grip, and the network route near MIRA are presented in this report.

The assessment of skid resistance measurements falls into two parts; machine repeatability and variation between machines (see Appendix D).

5.1 Machine repeatability

The between run standard deviation (BRSD) data for the skid resistance measurements are given in Appendix B. On examination of the between run standard deviation and plots of the individual runs the following observations were made:

- The data from the first set of tests on the Straight Line Wet Grip area shows higher BRSD for some machines on SWG04. It has been found from previous trials that SWG04 experiences larger track conditioning effects and as such the BRSD is typically higher.
- For the MIRA network route there were a few scattered instances where increased BRSD was seen. However, no machine or section was noticeably different from the rest.
- The second set of tests on the Straight Line Wet Grip shows higher BRSD for some machines on SWG04.

Therefore, due to no consistent outliers, all machines were deemed to be performing acceptably with regards to between run variation and no test sections needed to be excluded from the analysis.

5.2 Variation between machines

The average Skid Reading (SR) values produced by the machines for each of the test sites are shown in the tables below (Table 5.1to Table 5.4). At the base of each table is the average calculated for the trial indicated as “Trial mean”, and the Between Equipment Standard Deviation for the trial indicated as “Trial BESD”.

Three machines (machines 16, 26 and 38) taking part in the trial were not accredited during the previous year (machines 16 and 26 did not take part and 38 is a new machines). The reference dataset excludes machines that were not accredited during the previous year, as such these machines cannot be considered as part of the reference dataset. Therefore, in

addition to the mean and BESD for the trial (all machines), the tables below also show the mean and BESD for the reference machines.

Machine SR values are highlighted in green if they lie within 2 times the BESD criterion (see Appendix D) of the reference mean, in orange if they lie between 2 and 3 times the BESD criterion, and in red if they are greater than 3 times the BESD criterion. The "Ref BESD" and "Trial BESD" values are highlighted in green if they are below the BESD criterion, in orange if they are below 1.5 times the BESD criterion and in red if they exceed this value.

5.2.1 First set of Straight Line Wet Grip tests (23rd April)

Due to time constraints, it was identified that a full set of 5 laps for each machine would not be possible on this day. As such a target of 2 to 3 laps for each machine was set to provide suitable data for identifying outliers. This was achieved for all machines except for machine 29 which had issues and was only able to take part in one lap. The results from this testing are shown in Table 5.1.

Table 5.1: Average SR from the 1st set of tests on the Straight Line Wet Grip

ID	SWG01	SWG02	SWG03	SWG04	Avg
3	65.0	93.6	28.1	60.8	62.3
13	62.7	91.9	27.0	61.3	61.0
16	74.0	108.8	37.3	72.9	73.3
17	61.4	90.8	25.4	58.2	59.3
19	61.5	92.8	27.2	58.4	60.2
21	68.0	100.2	28.5	63.7	65.5
22	62.4	91.8	25.5	59.0	60.0
23	63.2	91.4	30.2	61.8	61.9
24	62.2	91.8	27.3	63.4	61.3
25	66.5	95.6	29.7	62.7	64.0
26	63.9	94.3	29.0	62.7	62.7
28	67.3	96.0	29.3	66.5	65.1
29	75.0	111.2	34.3	72.0	73.4
31	63.3	95.0	27.9	60.5	61.9
33	64.0	95.9	27.6	60.9	62.4
35	65.5	97.0	27.3	64.3	63.8
37	61.5	89.4	26.9	59.7	59.7
38	65.7	93.7	32.2	64.5	64.3
Ref mean	64.6	95.0	28.2	62.2	62.8
Ref BESD	3.58	5.31	2.17	3.57	3.50
Trial mean	65.2	95.6	28.9	63.0	63.5
Trial BESD	3.93	5.84	3.03	4.12	4.04

It can be seen from Table 5.1 that the BESD criteria is not met for the average of the site for the trial dataset. If the two outliers (machines 16 and 29) are excluded then the trial BESD drops down to 1.93 which is within the BESD criteria. Therefore, based on this information it

was recommended that the operators of these two devices should investigate their machines before the remaining testing in the trial. It was also identified that the vertical calibration for Machine 22 was out of date and as such this would also need to be carried out before the remaining testing in the trial.

5.2.2 MIRA Network route tests (24th April)

As noted in section 3.3, fourteen 100m lengths of varying skid resistance levels have been selected on the network route for the analysis. These lengths are selected for homogeneity of skid resistance within the length and low indications of variation due to test line. As such the lengths used (and the typical skid resistance values) may vary between trials. As noted in section 2.3, part of the site preparation tasks is to drive through the site to identify if there are any issues with using the routes (e.g. roadworks) or any aspects that may need to be considered when assessing the data collected. A drive through of the MIRA network route was undertaken prior to the trial and it was found that the skid resistance values were suitable and no roadworks were in place nor were any signs up announcing imminent works. The results from the testing on the Network route are shown in Table 5.2.

Table 5.2: Average SR from the MIRA network route surveys

ID	NSM 01	NSM 02	NSM 03	NSM 04	NSM 05	NSM 06	NSM 07	NSM 08	NSM 09	NSM 10	NSM 11	NSM 12	NSM 13	NSM 14	Avg
3	67.7	57.8	67.5	78.4	62.0	71.8	70.0	66.9	67.9	50.5	66.5	65.4	61.1	67.4	65.8
13	64.4	58.5	66.0	77.7	61.8	71.9	70.2	67.4	68.2	50.5	66.6	65.1	56.6	68.2	65.2
16	67.1	59.1	68.5	80.2	62.7	73.6	73.7	71.9	73.6	52.2	71.4	68.3	61.1	71.5	68.2
17	65.7	57.8	68.5	78.3	60.5	72.0	70.9	66.8	69.0	49.5	65.9	63.0	57.4	67.8	65.2
19	68.6	59.5	69.1	80.0	61.6	73.3	72.9	68.4	71.7	53.1	67.9	65.2	59.4	69.2	67.1
21	74.0	65.9	77.8	90.6	73.5	81.1	79.1	73.3	78.8	57.5	73.9	69.0	62.8	78.3	74.0
22	72.8	63.6	75.5	84.3	64.1	77.5	76.3	68.4	73.4	54.4	70.8	67.9	62.5	72.4	70.3
23	64.9	55.0	68.7	77.4	61.8	71.0	68.2	63.8	68.7	49.4	62.7	59.6	56.7	66.9	63.9
24	69.0	57.7	71.0	81.0	66.2	72.9	71.7	67.1	71.0	54.2	66.0	64.1	57.9	69.7	67.1
25	69.9	62.2	72.7	81.7	65.6	74.4	75.4	71.6	75.5	56.4	72.4	69.2	61.7	74.4	70.2
26	70.4	67.7	70.8	83.9	65.9	73.8	72.0	67.9	69.8	50.7	66.7	65.2	58.5	70.5	68.1
28	70.1	58.2	72.8	81.5	61.1	76.8	75.0	69.8	73.4	55.5	69.0	66.4	59.8	72.3	68.7
29	66.5	54.2	66.7	76.6	57.4	66.8	67.2	62.2	66.9	46.5	65.6	61.6	55.0	64.6	62.7
31	66.1	58.6	67.9	78.9	61.3	70.9	69.2	64.7	68.3	50.2	64.5	63.6	58.4	67.1	65.0
33	71.7	61.0	71.2	81.1	64.2	73.6	73.6	70.4	73.0	54.4	68.5	67.1	60.6	70.5	68.7
35	71.3	61.1	70.4	86.7	63.8	75.6	73.8	69.8	75.7	51.7	69.4	67.4	61.4	71.3	69.3
37	69.1	58.4	70.9	80.3	65.1	73.5	71.5	66.8	69.5	52.5	66.8	63.9	59.5	68.0	66.8
38	69.2	58.5	71.1	83.4	66.3	74.2	76.8	67.8	70.7	55.1	67.3	64.3	62.0	68.0	68.2
Ref mean	68.8	59.3	70.4	81.0	63.3	73.5	72.3	67.8	71.4	52.4	67.8	65.2	59.4	69.9	67.3
Ref BESD	2.92	3.07	3.27	3.78	3.61	3.33	3.25	2.94	3.49	3.01	2.98	2.71	2.33	3.47	2.91
Trial mean	68.8	59.7	70.4	81.2	63.6	73.6	72.6	68.1	71.4	52.5	67.9	65.4	59.6	69.9	67.5
Trial BESD	2.71	3.43	3.01	3.55	3.41	3.03	3.15	2.84	3.24	2.84	2.86	2.58	2.26	3.21	2.66

It can be seen from Table 5.2 that the trial BESD is within the criterion for the average of the site. In addition, no machine was identified as being more than three times the BESD criterion away from the reference mean for the average of the site.

5.2.3 Second set of Straight Line Wet Grip tests (25th April)

The results from the 2nd set of tests on the Straight Line Wet Grip are shown in Table 5.3.

Table 5.3: Average SR from the 2nd set of tests on the Straight Line Wet Grip – initial results

ID	SWG01	SWG02	SWG03	SWG04	Avg
3	59.6	86.4	23.0	53.3	56.1
13	64.8	92.7	24.8	58.1	60.8
16	60.6	91.3	22.0	57.3	58.2
17	60.4	89.2	22.8	54.6	57.2
19	64.3	95.2	25.0	58.3	61.2
21	65.6	95.6	24.1	57.2	61.3
22	64.6	96.9	22.4	57.2	60.9
23	62.0	89.6	25.9	57.4	59.2
24	63.0	91.9	25.3	56.7	59.8
25	69.2	97.7	32.0	62.0	65.8
26	61.0	88.8	25.0	55.9	58.2
28	64.5	93.0	25.9	58.6	61.1
29	55.9	88.3	15.3	49.1	52.7
31	62.5	91.5	25.1	57.4	59.6
33	61.6	93.1	26.1	58.3	60.1
35	63.0	93.5	24.5	58.0	60.2
37	61.1	85.8	23.5	56.0	57.3
38	63.4	90.9	27.2	61.1	61.0
Ref mean	62.8	92.0	24.4	56.8	59.6
Ref BESD	3.04	3.60	3.38	2.88	2.93
Trial mean	62.6	91.7	24.4	57.0	59.5
Trial BESD	2.84	3.37	3.20	2.81	2.73

On examination of Table 5.3 it can be seen that the Trial BESD does not meet the criterion, and two outliers (machines 25 and 29) can be identified. During the test day the results were discussed with the operators of these two devices and it was identified that the horizontal calibrations carried out in the morning for these devices was slightly out. These machines were recalibrated and undertook a full set of testing (with some other devices to allow for track conditioning effects to be monitored). No significant track conditioning effects were observed, as such the updated data for these two machines (machines 25 and 29) were substituted into the previous set of testing. The updated table of results can be seen in Table 5.4.

Table 5.4: Average SR from the 2nd set of tests on the Straight Line Wet Grip – after additional testing

ID	SWG01	SWG02	SWG03	SWG04	Avg
3	59.6	86.4	23.0	53.3	56.1
13	64.8	92.7	24.8	58.1	60.8
16	60.6	91.3	22.0	57.3	58.2
17	60.4	89.2	22.8	54.6	57.2
19	64.3	95.2	25.0	58.3	61.2
21	65.6	95.6	24.1	57.2	61.3
22	64.6	96.9	22.4	57.2	60.9
23	62.0	89.6	25.9	57.4	59.2
24	63.0	91.9	25.3	56.7	59.8
25	64.8	90.8	28.1	56.5	60.7
26	61.0	88.8	25.0	55.9	58.2
28	64.5	93.0	25.9	58.6	61.1
29	60.2	89.7	21.4	53.0	56.7
31	62.5	91.5	25.1	57.4	59.6
33	61.6	93.1	26.1	58.3	60.1
35	63.0	93.5	24.5	58.0	60.2
37	61.1	85.8	23.5	56.0	57.3
38	63.4	90.9	27.2	61.1	61.0
Ref mean	62.8	91.7	24.5	56.7	59.5
Ref BESD	1.93	3.17	1.72	1.78	1.78
Trial mean	62.6	91.4	24.6	57.0	59.4
Trial BESD	1.88	2.96	1.80	1.94	1.72

On examination of this updated dataset it can be seen that the Trial BESD for the average of the site is well within the required criteria. In addition, all machines were within 2 times the BESD criterion of the reference mean.

Therefore, based on this data and the data collected on the network route all machines that attended the trial are deemed acceptable with regards to the reproducibility of skid resistance measurements.

5.3 Summary of skid resistance testing

All machines produced suitable results with regards to repeatability of skid resistance measurement (BRSD criterion, see Appendix D).

All machines produced suitable results with regards to reproducibility of skid measurement (BESD criterion, see Appendix D).

6 Location referencing

6.1 Distance measurement

The assessment of distance measurement recorded by the machines was undertaken using data from the Twin Straights. Testing was undertaken such that at least four passes at 50km/h were achieved for each machine. As discussed in section 4.5 some machines also carried out 80km/h testing. The data was assessed by comparing the lengths of five sections, A to B, B to C, D to E, E to F and F to G as shown in Figure 3.2 (i.e. excluding the banked bends).

There are three mechanisms for recording location referencing points (from which distances can be determined) in the survey data:

1. Push button entry – survey contractor pushes a button to enter the location of the point manually.
2. Automatic marker detection – using a system to automatically detect the markers, typically retroreflective marker detection.
3. OSGR fitting – identifying locations of the markers using the collected OSGR data and known coordinate positions of the markers.

In order to assess the distance measurement system in isolation, the OSGR fitting method is not typically used in the assessment (as this would introduce an additional variation into the assessment). Therefore, machines are assessed on the push button or automatic marker entry depending on whether the machine has automatic marker detection fitted. To account for potential operator error-in the push button entry method these two approaches have slightly different assessment criteria (see Appendix D).

In order to maintain the high levels of accuracy required by National Highways for their surveys, the machines that have OSGR systems fitted are assessed using the Automatic markers criteria (regardless of whether automatic marker detection is fitted or not).

The distance measurement results from the testing on the Twin Straights are shown in Table 6.1 along with the criteria applied and the performance achieved. Values which do not meet the required level (for the criteria used) are highlighted in bold red text.

Table 6.1: Distance measurement assessment

ID	Percentage within 1m	Percentage within 2m	Percentage within 5m	Percentage within 10m	Assessment criteria used	Met criterion
3	50%	100%	100%	100%	Automatic	Pass
13	80%	100%	100%	100%	Automatic	Pass
16	19%	**69%**	94%	100%	Automatic	Fail
17	63%	88%	100%	100%	Automatic	Pass
19	25%	88%	100%	100%	Automatic	Pass
21	0%	**20%**	**75%**	100%	Automatic	Fail
22	53%	84%	84%	84%	Automatic	Pass
23	40%	85%	100%	100%	Automatic	Pass
24	0%	**20%**	80%	100%	Automatic	Fail
25	61%	98%	100%	100%	Automatic	Pass
26	83%	94%	100%	100%	Automatic	Pass
28	68%	100%	100%	100%	Automatic	Pass
29	19%	88%	100%	100%	Automatic	Pass
31	56%	97%	100%	100%	Automatic	Pass
33	23%	88%	100%	100%	Automatic	Pass
35	55%	91%	100%	100%	Automatic	Pass
37	75%	100%	100%	100%	Automatic	Pass
38	48%	93%	100%	100%	Automatic	Pass

From Table 6.1 it can be seen that all but three machines meet the assessment criteria applied.

An assessment of the data from Machine 16 found that the differences in the lengths were inconsistent with several measurements within the target, and a few noticeably outside. This combined with the fact that this machine operates with manual markers suggests that this was an issue due to operator error. Further review of the data identifies that it meets the manual marker criteria (it was initially assessed against the automatic marker criteria due to the fact it has an OSGR system fitted). Therefore, this machine was awarded a “Pass*” and the following text was also added to the comment box on the accreditation certificate.

“This device did not meet the automatic markers criteria for distance (a requirement for systems providing OSGR data) however it did meet the manual markers criteria.”

Further examination of the data from machines 21 and 24 found that the ratio of the measured value to the reference value was consistent for each of the lengths on the site. This suggested that distance measurement systems on these devices were incorrectly calibrated.

The average ratio of measured length to reference length (i.e. measured divided by reference) for machines 21 and 24 is given in Table 6.2 (for measurements where both markers were automatically detected). Note: the length B to C is noticeably shorter than the other lengths and as such the ratio calculated for this length will be more variable than the others.

Table 6.2: Ratios of measured lengths to reference length

ID	A to B	B to C	D to E	E to F	F to G	Average (excluding B to C)
21	0.993	0.984	0.993	0.993	0.993	0.993
24	0.994	0.978	0.994	0.994	0.994	0.994

Although, the distance calibration is incorrectly set, this data identified that the machines appear to be repeatable in their measurement of distance. Machines 21 and 24 were then recalibrated for distance and retested on a subset of the assessment process. This identified that following the distance recalibration the machines produced results consistent with the reference. Therefore, it was identified that these machines should be awarded a pass, however the following additional text was added to the certificates of these two machines:

"During the distance assessment it was identified that this machine was consistently offset from the reference. It was deemed that the system was incorrectly calibrated. Following a recalibration and a subset of the testing, the machine performed to the required standard. Therefore a 'pass' has been awarded. It is recommended that the operator ensures that the calibration is closely monitored during the survey year."

Therefore, all machines that attended the trial have been deemed acceptable with regards to distance measurement (with additional notes for machines 16, 21 and 24).

6.2 3 dimensional spatial coordinates data

The assessment of 3 dimensional spatial coordinates is mandatory for any device that is to be used on the central National Highways survey contract and optional for the other devices; however, all eighteen machines took part in these tests.

The assessment is carried out on the Crowthorne network route and the network route near MIRA. The reference data from the Crowthorne network route were obtained from a high-resolution survey conducted by an independent mapping company, and the MIRA network route reference data was supplied by National Highways' HARRIS survey vehicle.

The Crowthorne network route also uses retro reflective marker posts to allow for the automatic detection of markers (where fitted). This site is within a forested area which results in interruption in satellite coverage providing a challenging scenario for the systems. This may highlight machines which are not suitable to survey in these conditions.

Due to the availability of clear marker posts and robust reference data, the Crowthorne network route was assessed against the closed test section criteria. Although the driving line is constrained, this is still a live site and therefore the 2m criteria level requirements were excluded. In the next update to the Accreditation specification the text relating to these criteria will be amended to clarify that live traffic routes which are suitable to be assessed using the closed test section can be assessed against these criteria and the 2m level requirements will be reviewed. The assessment criteria for "closed" and "live" sections as stated in the Accreditation specification are given in Appendix D.

The detailed results from the OSGR and altitude assessments and the criteria applied are given in Appendix C. All machines were assessed using the OSGR fitted criteria along with

the corresponding marker entry criteria. Data from any machines which did not provide OSGR fitted data, were fitted by TRL using National Highways' MSP software.

The final performance level awarded to each machine is the same as the lowest level achieved by the device from all of the 3-dimensional spatial coordinate tests completed during the trial.

The summary of the performance achieved on each site and the final awarded performance level are summarised in Table 6.3 and Table 6.4.

Table 6.3: Summary of OSGR assessments

ID	Performance on MIRA Network route (OSGR fitted)	Performance on Crowthorne Network route (OSGR fitted)	Performance on Crowthorne Network route (Marker entry)	Awarded Performance
3	High	High	Low	Low
13	High	High	High	High
16	High	Not Suitable	Not Suitable	Not Suitable
17	High	Low	Low	Low
19	High	High	High	High
21	High	Medium	Medium	Medium
22	High	Not Suitable	Not Suitable	Not Suitable
23	High	High	Medium	Medium
24	High	High	Low	Low
25	High	High	High	High
26	High	Medium	Low	Low
28	High	High	High	High
29	High	Not Suitable	Not Suitable	Not Suitable
31	High	High	Low	Low
33	High	High	High	High
35	High	High	High	High
37	High	High	High	High
38	High	High	High	High

It can be seen that there is a mixture of performances for the fleet overall (Table 6.3). All machines achieved a high performance on the MIRA network route, this is due to the less challenging environment (generally an unobstructed 'view' of the sky and hence satellites) and the lower level criteria specified for this site. Due to the heavy tree coverage, the Crowthorne route generally involves lower quality satellite signals (or complete loss of signal during parts) which can result in the lowest level of specified performance (Not Suitable) from some devices. For the combined assessment, eight machines achieve a high performance rating, two a medium, five a low and three not suitable.

Table 6.4: Summary of Altitude assessments

ID	Performance on MIRA Network route (OSGR fitted)	Performance on Crowthorne Network route (Marker entry)	Awarded Performance
3	High	Not Suitable	Not Suitable
13	High	High	High
16	Medium	Low	Low
17	High	Medium	Medium
19	High	Medium	Medium
21	Medium	Low	Low
22	Not Suitable	Not Suitable	Not Suitable
23	Medium	Low	Low
24	Medium	Medium	Medium
25	Medium	Medium	Medium
26	Medium	Medium	Medium
28	High	Low	Low
29	Not Suitable	Not Suitable	Not Suitable
31	High	Medium	Medium
33	High	Medium	Medium
35	High	Low	Low
37	Medium	Low	Low
38	Medium	Low	Low

For the measurement of altitude (Table 6.4) one machine achieved a high performance rating, seven a medium, seven a low and three not suitable. It should be noted that although an altitude assessment is specified this data is not typically used by end users of the data and as such generally has a lower priority assigned to it by operators.

7 File formats

All of the machines that took part in the skid resistance testing supplied suitable ".S10" and ".loc" files. Any device undertaking the OSGR assessment is also required to provide RCD files for the OSGR test sites. In addition any device that is to be used on the central National Highways contract shall provide BCD data (this is optional for other devices).

All eighteen machines provided RCD files. The following machines provided BCD files:

- Machine 13
- Machine 16
- Machine 17
- Machine 19
- Machine 22
- Machine 23
- Machine 24
- Machine 25
- Machine 26
- Machine 28
- Machine 29
- Machine 31
- Machine 37
- Machine 38

Examination of the supplied RCD and BCD found that the data formatting was suitable.

8 Conclusions and recommendations

The 2024 sideway-force skid resistance accreditation trial was held during the week commencing 22nd April 2024. The trial was held on and around the MIRA proving ground and on a Network route near TRL in Crowthorne. Eighteen machines attended.

The following conclusions were drawn in relation to the various mandatory tests and assessments:

(i) General condition

No machines were identified as having any issues with their general condition during the trial.

(ii) Skid resistance measurement

All eighteen machines met the criteria for the measurement of skid resistance at the trial.

(iii) Vehicle Speed attainment and recording

All eighteen machines met the criteria for vehicle speed attainment and recording.

(iv) Distance measurement

Fifteen of the eighteen machines met the automatic markers criteria during the initial testing. Following further testing/review the remaining three machines were also found to be acceptable.

(v) Left test wheel weight

All eighteen machines met the current ±8 kg tolerance for the left test wheel weight.

(vi) Water flow

All eighteen machines were found to provide satisfactory water flow and direction.

The following conclusions were drawn in relation to the various additional tests and assessments (note: OSGR is mandatory for machines operating on the central National Highways survey contract and optional for others):

(vii) Measurement of OSGRs

All eighteen machines were fitted with 3-dimensional spatial coordinate systems and were assessed for the measurement of OSGRs. Eight machines achieved a high performance, two a medium, five a low and three not suitable.

(viii) Measurement of Altitude

All eighteen machines were assessed for the measurement of altitude. One machine achieved a high performance, seven a medium, seven a low and three not suitable.

(ix) File formats

All eighteen machines supplied.s10, .loc files and RCD files. BCD files were provided for fourteen machines. All of the provided files were found to be suitably formatted.

A summary of the machines that attended the 2024 accreditation trial and the criteria that they met can be found in Appendix A.

For the 2024 trial, one participant arrived late which caused disruption to the test programme. This event identified that improvements could be made in communication between participants and Trial Marshals with regards to delays in arrival to minimise disruption to testing. Options for this include contact phone numbers and/or instant messaging. It is recommended that the Auditor investigates suitable options (in discussion with the participants) before the next trial. In addition, the Auditor should further develop contingency plans for managing late arrivals, to lessen the impact on other participants.

It has been observed that some devices require additional work or recalibration during the trial. This is not ideal and raises concerns about performance during the course of the year. Therefore, it is recommended that that this is discussed further in the next meeting between National Highways, the Auditor and participants to identify what can be introduced to reduce these occurrences.

It is acknowledged that the current accreditation and QA specification requires updating to more accurately reflect the current OSGR assessment process (use of controlled network route vs test track). Therefore, this should be considered when the document is next reviewed.

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Appendix A Machine identification and performance

Table A.1: Machine identification and performance summary

ID	Current Owner	Registration number	Skid resistance	Speed	Distance travelled[1]	Weight	OSGR	Altitude	S10 and loc file	RCD file	BCD file
3	DFI Roads	IKZ 2203	Pass	Pass	Pass	Pass	Low	Not Suitable	Satisfactory	Satisfactory	-
13	WDM Ltd	S700 WDM	Pass	Pass	Pass	Pass	High	High	Satisfactory	Satisfactory	Satisfactory
16	PTS Ltd	S66 HSL	Pass	Pass	Pass*[2]	Pass	Not Suitable	Low	Satisfactory	Satisfactory	Satisfactory
17	WDM Ltd	S800 WDM	Pass	Pass	Pass	Pass	Low	Medium	Satisfactory	Satisfactory	Satisfactory
19	WDM Ltd	S900 WDM	Pass	Pass	Pass	Pass	High	Medium	Satisfactory	Satisfactory	Satisfactory
21	Surrey CC	KX07YXH	Pass	Pass	Pass	Pass	Medium	Low	Satisfactory	Satisfactory	-
22	PTS Ltd	KX07YVH	Pass	Pass	Pass	Pass	Not Suitable	Not Suitable	Satisfactory	Satisfactory	Satisfactory
23	WDM Ltd	S11 WDM	Pass	Pass	Pass	Pass	Medium	Low	Satisfactory	Satisfactory	Satisfactory
24	WDM Ltd	S12 WDM	Pass	Pass	Pass	Pass	Low	Medium	Satisfactory	Satisfactory	Satisfactory
25	WDM Ltd	S13 WDM	Pass	Pass	Pass	Pass	High	Medium	Satisfactory	Satisfactory	Satisfactory
26	WDM Ltd	S14 WDM	Pass	Pass	Pass	Pass	Low	Medium	Satisfactory	Satisfactory	Satisfactory
28	National Highways[3]	WX60 AXN	Pass	Pass	Pass	Pass	High	Low	Satisfactory	Satisfactory	Satisfactory
29	PTS Ltd	YD02 XSN	Pass	Pass	Pass	Pass	Not Suitable	Not Suitable	Satisfactory	Satisfactory	Satisfactory
31	WDM Ltd	S16 WDM	Pass	Pass	Pass	Pass	Low	Medium	Satisfactory	Satisfactory	Satisfactory
33	PMS	17 2G 1777	Pass	Pass	Pass	Pass	High	Medium	Satisfactory	Satisfactory	-
35	PMS	22 1G 1770	Pass	Pass	Pass	Pass	High	Low	Satisfactory	Satisfactory	-
37	WDM Ltd	S18 WDM	Pass	Pass	Pass	Pass	High	Low	Satisfactory	Satisfactory	Satisfactory
38	WDM Ltd	TX233-076	Pass	Pass	Pass	Pass	High	Low	Satisfactory	Satisfactory	Satisfactory

[1] Machines are assessed on different criteria depending on the equipment fitted. See section 6.1 or the test certificate for details on criteria used.

[2] Did not meet the automatic markers criteria (requirement if OSGR fitted). No automatic marker detection was fitted and the machine met the manual markers criteria.

[3] Operated by TRL on behalf of National Highways

Appendix B Between run standard deviation

Values that are within the BRSD criteria (see Appendix D) are shaded in green. Values up to 1 standard deviation greater than the criteria are shaded in orange, and greater than this in red. Note: averages are calculated by taking the square root of the average variance.

Table B.1: Between run SD for the 1st set of tests on the Straight Line Wet Grip

ID	SWG01	SWG02	SWG03	SWG04	Avg
3	1.56	2.11	2.21	1.99	1.93
13	0.72	1.27	1.92	1.43	1.33
16	2.54	5.63	2.97	1.64	3.40
17	0.75	1.31	1.34	2.87	1.65
19	0.87	0.59	0.26	1.82	1.03
21	1.91	1.41	2.27	3.76	2.42
22	1.59	0.98	1.16	0.82	1.24
23	1.34	1.29	0.76	1.98	1.40
24	0.29	1.79	1.80	1.18	1.31
25	1.37	0.55	1.62	1.42	1.31
26	0.09	0.63	0.50	1.02	0.61
28	0.66	0.94	0.47	5.62	2.67
29	.	.	.	.	.
31	0.08	0.10	1.52	2.86	1.50
33	1.28	0.28	1.50	2.49	1.55
35	1.59	1.89	0.39	0.66	1.34
37	1.12	2.90	2.16	5.06	2.96
38	0.76	0.40	0.60	0.30	0.58
Avg	1.26	1.90	1.58	2.61	1.83

Table B.2: Between run SD for the Network route

ID	NSM 01	NSM 02	NSM 03	NSM 04	NSM 05	NSM 06	NSM 07	NSM 08	NSM 09	NSM 10	NSM 11	NSM 12	NSM 13	NSM 14	Avg
3	1.58	1.45	1.50	2.39	3.94	0.89	2.34	1.66	1.01	1.38	1.13	0.73	1.98	0.99	2.00
13	2.58	1.64	2.28	1.79	2.50	1.93	1.31	1.27	2.04	5.03	1.61	1.70	2.20	1.22	2.46
16	0.98	2.36	1.59	1.88	3.75	2.01	3.15	1.76	0.90	2.04	1.31	1.00	1.39	1.55	2.21
17	2.58	1.48	1.09	0.49	1.05	2.19	0.70	1.80	1.35	0.94	0.60	1.08	0.89	0.81	1.50
19	1.01	1.09	0.88	0.06	1.43	1.00	0.48	1.21	0.94	0.79	0.97	0.39	0.43	0.52	0.96
21	1.88	2.78	2.16	3.76	2.11	2.78	1.60	1.65	1.48	2.22	1.28	1.20	0.44	1.81	2.34
22	0.81	1.46	0.66	0.35	2.58	0.47	0.65	1.18	1.22	0.48	1.11	1.32	1.51	1.08	1.17
23	0.92	2.27	1.05	1.83	0.55	0.92	0.59	1.17	0.76	1.54	1.02	0.90	1.49	1.66	1.28
24	2.77	1.49	1.37	0.53	3.90	1.34	1.49	2.04	1.33	1.37	0.72	1.36	0.35	1.39	1.98
25	0.79	3.85	0.46	2.30	5.44	1.82	1.38	1.58	0.45	1.05	0.42	0.88	1.17	0.81	2.44
26	2.22	4.05	0.55	1.82	3.48	2.32	2.29	1.87	0.47	0.11	0.68	0.92	1.54	1.26	2.27
28	2.34	2.70	2.38	2.64	2.79	1.62	0.70	0.30	0.94	1.09	1.00	2.85	2.50	1.31	1.96
29	2.80	1.26	0.94	0.43	2.36	0.44	0.62	1.56	1.53	1.80	4.93	1.78	2.36	1.05	1.57
31	2.04	2.74	1.80	1.91	2.65	1.73	1.47	1.35	1.91	1.71	2.01	1.38	4.17	2.44	1.98
33	0.25	3.84	0.96	3.31	0.92	0.45	1.56	1.03	0.92	0.35	1.28	2.64	0.74	0.70	1.79
35	2.49	0.56	1.18	6.63	6.19	1.80	2.68	2.68	1.18	2.50	2.25	1.29	1.44	2.12	3.40
37	0.75	1.83	0.79	2.50	1.03	2.01	1.85	2.12	0.90	1.43	1.75	1.60	1.46	0.89	1.63
38	0.64	3.34	0.72	1.86	1.06	1.41	0.74	3.63	1.41	0.78	2.20	1.82	3.34	0.72	1.87
Avg	1.84	2.45	1.37	2.52	3.07	1.65	1.62	1.80	1.23	1.82	1.76	1.51	1.91	1.34	2.01

Table B.3: Between run SD for the 2nd set of tests on the Straight Line Wet Grip

ID	SWG01	SWG02	SWG03	SWG04	Avg
3	1.06	1.29	0.80	1.51	1.18
13	1.80	1.54	0.92	2.64	1.83
16	1.48	0.67	0.92	2.26	1.47
17	1.50	2.36	0.57	3.02	2.01
19	2.13	1.21	0.59	2.39	1.80
21	1.18	1.15	0.65	1.33	1.12
22	1.49	1.23	2.09	1.52	1.60
23	0.86	2.13	0.46	2.12	1.50
24	1.41	1.42	2.95	1.59	1.88
25	0.94	0.46	1.05	0.90	0.88
26	1.52	1.70	2.52	1.71	1.85
28	2.44	2.28	1.05	4.97	2.96
29	1.62	1.54	0.76	1.90	1.53
31	1.30	1.27	0.77	1.17	1.17
33	1.53	1.84	1.76	3.33	2.15
35	1.33	0.66	0.32	1.48	1.11
37	1.06	3.51	0.59	1.92	1.98
38	1.13	1.78	2.66	3.05	2.15
Avg	1.49	1.71	1.44	2.36	1.74

Appendix C Assessment of 3-dimensional spatial coordinates data

C.1 OSGR data

Table C.1: OSGR performance (percentage of 10m data points within): MIRA Network route –OSGR fitted data

ID	3m	6m	12m	17m	20m	25m	30m	Performance
3	98%	100%	100%	100%	100%	100%	100%	High
13	99%	100%	100%	100%	100%	100%	100%	High
16	99%	100%	100%	100%	100%	100%	100%	High
17	99%	100%	100%	100%	100%	100%	100%	High
19	99%	100%	100%	100%	100%	100%	100%	High
21	96%	99%	100%	100%	100%	100%	100%	High
22	99%	100%	100%	100%	100%	100%	100%	High
23	96%	98%	100%	100%	100%	100%	100%	High
24	100%	100%	100%	100%	100%	100%	100%	High
25	100%	100%	100%	100%	100%	100%	100%	High
26	97%	100%	100%	100%	100%	100%	100%	High
28	97%	98%	100%	100%	100%	100%	100%	High
29	97%	100%	100%	100%	100%	100%	100%	High
31	99%	100%	100%	100%	100%	100%	100%	High
33	98%	99%	100%	100%	100%	100%	100%	High
35	91%	100%	100%	100%	100%	100%	100%	High
37	98%	100%	100%	100%	100%	100%	100%	High
38	99%	100%	100%	100%	100%	100%	100%	High

Table C.2: OSGR performance (percentage of 10m data points within): Crowthorne network route –OSGR fitted data

ID	2m	4m	5m	7m	8m	20m	25m	Performance
3	73%	96%	97%	98%	98%	100%	100%	High
13	89%	100%	100%	100%	100%	100%	100%	High
16	32%	62%	76%	85%	88%	99%	100%	Not Suitable
17	62%	89%	96%	99%	99%	100%	100%	Low
19	90%	99%	100%	100%	100%	100%	100%	High
21	71%	93%	97%	99%	99%	100%	100%	Medium
22	36%	60%	67%	77%	80%	100%	100%	Not Suitable
23	72%	99%	100%	100%	100%	100%	100%	High
24	78%	97%	100%	100%	100%	100%	100%	High
25	85%	100%	100%	100%	100%	100%	100%	High
26	74%	92%	96%	99%	100%	100%	100%	Medium
28	89%	100%	100%	100%	100%	100%	100%	High
29	59%	75%	80%	88%	93%	99%	100%	Not Suitable
31	72%	97%	99%	100%	100%	100%	100%	High
33	76%	100%	100%	100%	100%	100%	100%	High
35	79%	100%	100%	100%	100%	100%	100%	High
37	92%	100%	100%	100%	100%	100%	100%	High
38	87%	98%	98%	99%	100%	100%	100%	High

Table C.3: OSGR performance (percentage of 10m data points within): Crowthorne network route–Push button or automatic marker data

ID	2m	4m	5m	7m	8m	20m	25m	Marker entry type	Performance
3	29%	81%	90%	96%	98%	100%	100%	Automatic	Low
13	80%	100%	100%	100%	100%	100%	100%	Automatic	High
16	30%	62%	76%	86%	88%	98%	100%	Push	Not Suitable
17	43%	84%	92%	98%	99%	100%	100%	Automatic	Low
19	52%	99%	99%	100%	100%	100%	100%	Automatic	High
21	65%	91%	99%	100%	100%	100%	100%	Automatic	Medium
22	15%	38%	58%	75%	79%	100%	100%	Push	Not Suitable
23	54%	94%	100%	100%	100%	100%	100%	Automatic	Medium
24	43%	85%	98%	100%	100%	100%	100%	Automatic	Low
25	62%	99%	100%	100%	100%	100%	100%	Automatic	High
26	47%	87%	95%	99%	100%	100%	100%	Automatic	Low
28	65%	97%	100%	100%	100%	100%	100%	Automatic	High
29	42%	70%	75%	86%	92%	99%	100%	Push	Not Suitable
31	34%	85%	93%	100%	100%	100%	100%	Automatic	Low
33	57%	98%	100%	100%	100%	100%	100%	Push	High
35	53%	89%	96%	100%	100%	100%	100%	Push	High
37	60%	99%	100%	100%	100%	100%	100%	Automatic	High
38	46%	98%	100%	100%	100%	100%	100%	Automatic	High

C.2 Altitude data

Table C.4: Altitude performance (percentage of 10m data points within): MIRA Network route – OSGR fitted data

ID	2m	4m	5m	6m	20m	Performance
3	97%	100%	100%	100%	100%	High
13	90%	100%	100%	100%	100%	High
16	82%	100%	100%	100%	100%	Medium
17	98%	100%	100%	100%	100%	High
19	98%	100%	100%	100%	100%	High
21	47%	100%	100%	100%	100%	Medium
22	0%	0%	0%	0%	0%	Not Suitable
23	86%	100%	100%	100%	100%	Medium
24	67%	100%	100%	100%	100%	Medium
25	87%	100%	100%	100%	100%	Medium
26	75%	100%	100%	100%	100%	Medium
28	99%	100%	100%	100%	100%	High
29	0%	0%	0%	0%	0%	Not Suitable
31	98%	100%	100%	100%	100%	High
33	97%	100%	100%	100%	100%	High
35	96%	100%	100%	100%	100%	High
37	46%	96%	100%	100%	100%	Medium
38	89%	100%	100%	100%	100%	Medium

Table C.5: Altitude performance (percentage of 10m data points within): Crowthorne Network route – Push button or automatic marker data

ID	2m	4m	5m	6m	20m	Performance
3	59%	70%	79%	82%	95%	Not Suitable
13	95%	100%	100%	100%	100%	High
16	50%	79%	84%	88%	100%	Low
17	64%	91%	98%	99%	100%	Medium
19	80%	100%	100%	100%	100%	Medium
21	2%	61%	84%	97%	100%	Low
22	0%	0%	0%	0%	0%	Not Suitable
23	35%	71%	80%	87%	100%	Low
24	85%	94%	95%	98%	100%	Medium
25	73%	100%	100%	100%	100%	Medium
26	72%	98%	100%	100%	100%	Medium
28	31%	71%	84%	90%	100%	Low
29	0%	0%	0%	0%	0%	Not Suitable
31	51%	92%	100%	100%	100%	Medium
33	68%	88%	91%	96%	100%	Medium
35	32%	76%	93%	96%	100%	Low
37	3%	53%	76%	99%	100%	Low
38	39%	79%	90%	96%	100%	Low

Appendix D Assessment criteria

The accreditation trial criteria are specified in "Accreditation and Quality Assurance of Sideways Force Skid Resistance Survey Devices" (TRL, 2020). This document is a live document (i.e. is subject to change) and the June 2020 version of the document was used for the 2023 Accreditation trial. The relevant section of the document is reproduced verbatim below (including the section numbering from that document) in section D.1. Note in the text below:

- "Equipment" is a defined term and refers to the overall machine being assessed, incorporating the measuring systems and the survey vehicle.
- "System" refers to an individual measurement system installed on the Equipment, e.g. the sideway-force measurement system, GPS, distance measurement system, etc.
- "Employer" refers to the organisation that commissions the Survey Contractor to complete a survey and will generally be the final user of the data provided.
- "Owner" refers to the organisation or individual to which Equipment belongs and to whom Accreditation Certificates are awarded.

D.1 Trial criteria from the Accreditation and QA document

E.3 Equipment inspection

E3.1 Equipment shall be inspected to ensure that they are in a suitable condition to conduct the tests. Contractors should be provided with an inspection check sheet to complete and provide to the Auditor in advance of the Trial.

E3.2 Inspections shall include:

- Water flow System (including verification of flow rate, nozzle alignment and general condition).
- Verification of the test wheel weight.
- Verifying that the Equipment is in good general mechanical order.

E3.3 During the trial the Auditor should confirm that the Contractors have undertaken the following calibrations:

- Vertical load System
- Horizontal load System

E.4 Running Trials

E4.1 Overview

E4.1.1 As detailed in Appendix B, trials shall be carried out on a test site separated into test stations, and laid out such that laps of the set of test sections can be undertaken by the Fleet for the purposes of repeating the measurements.

E4.2 Skid resistance testing – Mandatory Requirement

E4.2.1 The assessment for skid resistance measurements is described below, and a worked example is provided in Appendix C.

E4.2.2 Some Equipment may have skid resistance measurement Systems fitted to both the nearside and offside of the Equipment. If fitted then these systems should be assessed independently and given independent Accreditation results. This requires that suitable reference data is collected for both wheel paths or that the Equipment test on offset driving lines so that the test wheel traffics the same part of the test surface. The Auditor may specify that only one side of the Equipment will be assessed.

E4.2.3 The Equipment shall undertake laps so that the following criteria are met:

- At least 3 laps are undertaken that comply with the requirements for Reference Data (see Appendix B, App B.3).
- Survey data is collected at the target test speed.

E4.2.4 The Contractor shall supply the skid resistance measurements for their Equipment from each test lap in the file formats specified by the Auditor.

E4.2.5 The Auditor shall calculate:

- The mean values for the Equipment for each 100m length test section or the length of the test section if shorter (averaging together the repeat measurements).
- The standard deviation of these mean values for the Fleet and for all of the Equipment at the trial, referred to as the Fleet between-Equipment standard deviation (BESD) and the Trial BESD. These values shall be used to assess the consistency of the Equipment at the Trial.
- The standard deviation of the skid resistance values between runs for the Equipment for 100m lengths (or the length of the test section if shorter). This data is referred to as the between-run standard deviation (BRSD). These values shall be used to assess the repeatability of each individual Equipment.

E4.2.6 The BRSD assessment criterion is given in Table 1. Where the BRSD criterion is exceeded, the data shall be examined for any obvious error, for example as a result of significant variation in test line, and if necessary individual runs on that section may be excluded from subsequent analysis. If Equipment consistently records data with unacceptable between-run standard deviation, the data from that Equipment shall be regarded as unacceptable.

E4.2.7 The Trial BESD shall be acceptable if it is below the criterion given in Table 1. If the Trial BESD exceeds this criterion then the data shall be further examined to identify outlying Equipment. This should include examining the fleet BESD and data from individual Equipment. Outlying Equipment shall be rejected and the data reassessed until the performance is acceptable.

E4.2.8 In addition, any Equipment that deviates by more than 3 times the BESD criterion from the Fleet mean shall be rejected. Any Equipment that is between two and three times the BESD criterion from the all-Equipment mean shall be subject to further investigation.

E4.2.9 The data from any Equipment rejected due to the BRSD, BESD or otherwise identified as an outlier shall not be used in the calculation of the Reference Data (App B.3.1).

Table 1 – Acceptance Criteria for Skid resistance measurements

Parameter	Acceptability Limit
Between run standard deviation (BRSD)	Investigate if >3 SR on 100m lengths
Between Equipment standard deviation (BESD) on closed site (e.g. test track)	≤2.7 SR
Between Equipment standard deviation (BESD) on live site (e.g. network route)	≤2.8 SR

E4.2.10 The Auditor should also review the vertical load Parameter in the data collected at the trial with the aim to identify anomalies and to develop tests for this Parameter to be included in future specifications. If the Auditor identifies anomalies in this data, this may lead to additional testing of Equipment, Accreditation for Equipment being withheld and/or issuing of Improvement Notices (see Section H).

E4.2.11 In addition to the above assessments the Auditor should review the profiles of the Survey Data over the site for each Equipment and investigate any anomalies. Based on the results of the investigation the Auditor may withhold Accreditation for Equipment and/or issue an Improvement Notice as detailed in Section H.

E4.3 Vehicle Speed – Mandatory Requirement

E4.3.1 The assessment of vehicle speed is split into two parts:

- The speed recorded by the Equipment compared with the independently measured speed
- The speed recorded by the independent measure compared with the required target survey speed.

E4.3.2 The test shall be carried out on at least 3 test laps at each target survey speed.

E4.3.3 The acceptance criteria for vehicle speed measurement are given in Table 2.

Table 2 – Acceptance Criteria for Vehicle Speed Measurement

Parameter	Acceptability Limit
Vehicle Speed recorded by the Equipment compared to independent measure	≥80% within ± 1km/h of the independently measured speed
Vehicle speed recorded by the independent measure compared to the target speed	≥80% within ± 3km/h of required target speed

E4.4 Location Referencing – Distance Criteria

E4.4.1 The Accreditation of distance measurement shall be carried out using at least 6 measurements of distance made using the Equipment.

E4.4.2 There are three mechanisms for recording location referencing points in the survey data:

- Push button entry relies on the survey operator pushing a button to enter the location of the point manually.
- Automatic marker uses a system which automatically detects the markers.
- OSGR fitted utilises the coordinate data to identify the elapsed chainage of the location reference points within the survey data.

E4.4.3 The push button entry approach will include some operator error and therefore it is expected that Equipment using this approach will be less accurate than the other methods. The criteria applied to the test measurements for the push button and automatic markers are given in Table 3.

Table 3 – Criteria for measurement of distance travelled for repeatability and reproducibility

Parameter	Push button entry	Automatic markers (where available)
Distance measured	≥80% within 5m	≥80% within 2m

E4.4.4 If the Survey Contractor will be supplying data to a Customer with OSGR fitted location reference points then the original survey data for these Equipment (i.e. not OSGR fitted) shall be assessed on the automatic markers criteria (regardless of the marker entry method used during the survey).

E4.5 Test wheel weight

E4.5.1 The Accreditation of test wheel weight shall be carried out using at least 3 measurements. There can be a tendency for the shaft bearings to stick slightly when the wheel is first lowered (without the shaking action that would be experienced on the moving vehicle at the start of a survey run). For this reason, the assessment shall be carried out after the bearings have been released (achieved by applying foot pressure to the wheel arm bearing and "bouncing" the back-plate against the suspension damper and spring).

E4.5.2 For this assessment the test wheel shall be raised/lowered and the "un-bounced" measurement taken. The System shall then be bounced and the "bounced" measurement taken. This process shall be repeated until at least 3 sets of measurements have been taken. The Auditor should review the differences between the bounced and un-bounced values and the ranges for the three sets of measurements. The "bounced" measurements made shall be averaged together and the criteria applied are given in Table 4.

Table 4 – Criteria for test wheel weight

Parameter	Acceptability Limit
"Bounced" test wheel weight	200±8kg

E4.6 Water flow

E4.6.1 The water delivery system shall be inspected and checked to confirm that the Equipment is delivering water at an acceptable rate and to the correct position on the road surface. The water flow delivery system is required to achieve a target

water film thickness of 0.5mm at 50km/h. Due to differences in design (e.g. position of the nozzle) the target flow rate to achieve this will differ between Equipment. The target flow rate for each Equipment shall be determined (through consultation between the Auditor and the Developer). Each Equipment shall be tested to confirm that the flow rate supplied is within the criteria given in Table 5. In the cases where the Equipment incorporates a speed controlled water flow system, the flow rate will be assessed using both 50km/h and 80km/h test pulses.

Table 5 – Criteria for water flow rate

Parameter	Acceptability Limit
Water flow rate	Within 10% of the target flow rate

E.5 Additional Tests

E5.1 Overview

E5.1.1 This sub-section describes the additional criteria which may be assessed to provide additional information on the capabilities of the Equipment. These criteria are assessed as High, Medium and Low levels of performance. These criteria typically include the assessment of Systems not fitted to all Equipment and/or tests which are not as mature as the mandatory assessments. In future revisions to this document some or all of these criteria may become mandatory criteria.

E5.1.2 Some Employers may require a specific level of performance in some or all of these additional tests to carry out Accredited Surveys on their Network.

E5.2 Location Referencing – OSGR data

E5.2.1 As noted in E4.4.2 there are three mechanisms for recording the location of location referencing points. The differences in these approaches result in different criteria for OSGR assessment. However, it is noted that automatic marker detection is normally not possible on a network route test and as such no automatic marker criteria are given for the network route.

E5.2.2 OSGR Systems shall be assessed using both the OSGR fitted criteria and the marker entry criteria (Push or Automatic) matching the method used during the survey. The criteria applied shall be noted on the Accreditation certificate. If the Survey Contractor does not supply OSGR fitted data, then the data will be fitted by the Auditor and noted as such on the Accreditation Certificate.

E5.2.3 OSGR data collected from the closed test sections shall be assessed using the criteria given in Table 6.

Table 6 – Closed test section: Criteria for OSGR data of individual 10m data points

Performance level	Push button entry	Automatic markers (where available)	OSGR fitted
High	90% within 5m 95% within 7m 100% within 20m	90% within 2m 95% within 4m 100% within 20m	90% within 2m 95% within 4m 100% within 20m
Medium	80% within 5m 90% within 7m 100% within 20m	80% within 2m 90% within 4m 100% within 20m	80% within 2m 90% within 4m 100% within 20m
Low	80% within 8m 100% within 20m	80% within 5m 100% within 20m	80% within 5m 100% within 20m
Not suitable	Otherwise	Otherwise	Otherwise

E5.2.4 OSGR data collected from a live traffic route shall be assessed using the criteria given in Table 7

Table 7 – Live traffic route: Criteria for OSGR data of individual 10m data points

Performance level	Push button entry	OSGR fitted
High	90% within 12m 100% within 25m	90% within 6m 100% within 20m
Medium	90% within 17m 100% within 25m	90% within 12m 100% within 25m
Low	100% within 25m	100% within 25m
Not suitable	Otherwise	Otherwise

E5.2.5 The OSGR performance recorded on the Accreditation Certificate shall correspond to the lowest performance of all of the test sites used and the criteria applied, unless it is identified that some data should be disregarded. If any data is disregarded then this should be recorded on the Accreditation Certificate along with the reasons.

E5.3 Location Referencing – Altitude data

E5.3.1 Altitude data collected shall be assessed using the criteria given in Table 8.

Table 8 –Criteria for Altitude data of individual 10m data points

Performance level	Criteria
High	90% within 2m 95% within 5m 100% within 20m
Medium	80% within 4m 90% within 6m 100% within 20m
Low	100% within 20m
Not suitable	Otherwise

E.6 Checking of file formats

E6.1.1 Some Employers require the production of data in specific data formats, for example Highways England requires data to be produced as Raw Condition Data (RCD) and

Base Condition Data (BCD). Where required, Owners shall be asked to deliver accreditation data files in the required format.

National Highways 2024 accreditation trial for sideway-force skid resistance devices

A key element in the successful maintenance of a road network is the availability of accurate, reliable and consistent survey data. To this aim, National Highways commission annual accreditation trial for Sideways Force Skid Resistance devices supported by ongoing QA for the devices. In order to undertake accredited surveys, the survey devices are required to meet the mandatory criteria of the trial.

This report covers the 2024 trial run by TRL and held in the week beginning the 22nd April.

Other titles from this subject area

PPR2046	National Highways 2023 accreditation trial for sideway-force skid resistance devices. S Brittain. 2026
PPR2045	National Highways 2022 accreditation trial for sideway-force skid resistance devices . S Brittain. 2026
PPR1021	Highways England 2021 national accreditation trial for sideway-force skid resistance devices. S Brittain. 2022
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