Automated Vehicles and the Readiness of Western Australian roads (Phase 2): Suitability of WA roads for Lane Departure Warning systems

RR 19-07

CURTIN-MONASH
ACCIDENT RESEARCH CENTRE

Faculty of Health Sciences

Curtin University

Kent Street

Bentley WA 6102

Elsegood, M. E., Mackenzie, J., Dutschke, J., Mongiardini, M.

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Author(s)

Elsegood, M. E., Mackenzie, J., Dutschke, J., Mongiardini, M.

Performing Organisation

Curtin-Monash Accident Research Centre (C-MARC)
Faculty of Health Sciences
Curtin University, Kent Street, BENTLEY, WA 6102
Tel: (08) 9266-2304 Fax: (08) 9266-2508
www.c-marc.curtin.edu.au

Sponsor

Road Safety Commission
Level 1, 161 Royal Street, EAST PERTH, WA 6004

Abstract

As a follow-on from a previous study: Automated Vehicles and the Readiness of Western Australian roads (Mackenzie et al., 2018), the aim of this project was to investigate the suitability of lane markings in remote areas of Western Australia (WA) for lane departure warning (LDW) systems. Specifically, lane markings at sites that had the presence of red pindan (a red dust in Northern WA) were investigated during both day and night conditions. An assessment of various lane markings at 19 sites along a section of the Great Northern Highway, starting approximately 80 km south of Newman and ending at Port Hedland in Western Australia was performed using a vehicle equipped with a lane departure warning (LDW) system during eight days of on-road trials. Lane marking crossing events were performed at each site by initially travelling at the speed limit in the centre of the lane and then instigating a drift to the left or right. A video system with two cameras, one viewing the wheel approaching the lane marking of interest and one viewing the vehicle's dashboard, was used to record whether a warning was triggered for each crossing event. Overall, there were 1,254 legitimate crossing events, with a further 30 that were deemed to be incorrectly performed. Of the legitimate crossing events, 1,250 (99.7%) gave an accurate warning, with a total of 4 (0.3%) warning failures. The warning failures were unable to be attributed to any constant characteristic of the lane marking or road environment. Performance in night conditions had a 100% warning activation accuracy and the presence of red pindan did not seem to influence the LDW system. One area of concern was the confusion caused for the LDW system generated by pseudo lines (black painted lines over previous lane markings). The findings of this study show that the lane markings tested on the remote WA roads provided a sufficient basis for the LDW system to provide appropriate warnings during line-crossing events, however, further testing is required in order for this to be conclusively demonstrated.

Keywords

Lane Departure Warning, Lane Keep Assist, Autonomous Vehicles

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ABBREVIATIONS

The following abbreviations are used throughout the report:

ACC – Adaptive Cruise Control

AEB – Autonomous Emergency Braking

CASR – Centre for Automotive Safety Research

C-MARC – Curtin-Monash Accident Research Centre

LDW – Lane Departure Warning

LKA – Lane Keep Assist

LSS – Lane Support System

MRWA – Main Roads Western Australia

SLK – Straight Line Kilometre

WA – Western Australia

EXECUTIVE SUMMARY

Introduction

The present report is a follow-on from a previous study by Mackenzie et al. (2018) – titled *Automated Vehicles and the Readiness of Western Australian Roads*. The aim of the previous study was to assess the readiness of Western Australian (WA) rural roads for vehicles with levels of autonomous driving technologies. Part of the previous study involved an on-road trial using vehicles with lane departure warning (LDW) systems to assess the positional sensitivity of the vehicle in relation to a combination of test variables (e.g. vehicle speed, lane marking type, or line retro-reflectivity). The report made recommendations for future research, these included increasing the quantity of line-crossing events and assessing the LDW systems during different lighting conditions, such as at night.

The aim of the present study was to further the assessment of the readiness of WA roads for autonomous vehicles by meeting the recommendations of the previous report. Specifically, the performance of an LDW system was again assessed in rural areas of WA, however, this time the system was tested during night-time and day-time conditions and with a larger number of line-crossing events. Additionally, road sites where red pindan (a red dust in Northern WA) was present were included in the trial as this may affect the ability of the technology to detect the lane markings.

Method

A trial vehicle (anonymised in this report), equipped with a commercial LDW system, was used to collect data during eight days of on-road trials that assessed various lane markings on remote roads in WA. Data was collected at 19 sites along a section of the Great Northern Highway, starting from 80 km south of Newman and ending at Port Hedland. The 19 remote sites were selected to provide a variety of lane marking types for assessment, including sites where red pindan was present. All sites were assessed during daylight hours, while 14 were assessed during night hours due to time constraints.

Details of lane marking dimensions, lane widths and shoulder widths were collected as part of an evaluation of each site before the centreline and edge line-crossing events were performed. These crossing events were completed by initially travelling at the

speed limit in the centre of the relevant travel lane and the driver instigating a drift to the left or right hand-side of the lane. A video system with two cameras, one viewing the left/right wheel of interest and one viewing the vehicle's dashboard, was used to record whether a warning was triggered for each crossing event. Other pertinent details regarding each crossing event were also recorded, such as the daylight brightness, temperature, and the presence of sun glare.

Results

Overall, data were recorded for 1,284 events in which the driver attempted to drift the vehicle over the centre or edge lines. One thousand two hundred and fifty-four were legitimate events in which the tyres crossed the line, while the remaining 30 were deemed to be incorrectly performed. Of the legitimate crossing events, 1,250 (99.7%) gave an accurate warning, while 4 (0.3%) were found to be warning failures. There were no common characteristics related to the lane markings or road environment in these four warning failures, and as a result it was not possible to identify a consistent cause of this small number of failures. Some false positive warning activations (a warning was provided without the tyres crossing a line) were observed where pseudo lines (black painted lines over previous lane markings) caused confusion for the LDW system.

Discussion

The findings of this study show that the lane markings tested on the remote WA roads provided a sufficient basis for the LDW system to provide appropriate warnings during line-crossing events, both in daylight and night time hours, as well as in the presence of red pindan. These results indicate that remote roads in WA may be suitable for vehicles with LDW technology. However, further trials would be required with a variety of vehicles, different LDW systems and a more comprehensive sample of roads in order for this to be conclusively demonstrated.

Recommendations

Considering the findings of this study, a few recommendations are appropriate. All lane markings should continue to be maintained to an optimal level. Road maintenance which results in the creation of 'pseudo lines' (e.g. black painted-over lines) should be avoided and rectified in locations where it has already occurred, so they do not

confuse LDW systems. Finally, in noting that lane departure warnings are triggered as a vehicle crosses a lane marking, sufficient space for drivers to recover in the event of a run-off lane event (e.g. sealed roadside shoulders) should be provided.

ACKNOWLEDGEMENTS

The authors would like to acknowledge Kamal Weeratunga and Meifang Lai from Main Road Western Australia for their assistance in preparing and carrying out this project; Peter Ellis from Main Roads Western Australia for his safety expertise and providing traffic management advice; Andrew van den Berg from the Centre for Automotive Safety Research for his assistance with equipment set-up; James Thompson from the Centre for Automotive Safety Research for his assistance with report editing; and the vehicle manufacturer of the trial vehicle for supplying a vehicle for the testing period.

1 INTRODUCTION

The development of automated vehicle-ready road treatments is particularly pertinent for rural and remote roads in Western Australia (WA), where nearly 50% of fatalities in the state occur (RSC, 2018a; RSC, 2018b). Typically, rural roads attract a high volume of crashes, several of which can be attributed to drivers failing to realise that their vehicle is unintentionally drifting out of the correct lane (Roman, 2016). According to Scanlon et al., (2015), the number of crashes on regional roads could be significantly decreased if vehicles were more capable of warning drivers of unintentional lane departure through the use of lane departure warning (LDW) systems or if vehicles were able to physically prevent unintentional lane departure through lane keep assist (LKA) systems. In regional and rural WA, road markings may be less than optimal to support this technology, which may affect the ability of the technology to reduce run-off road crashes.

A previous study by Mackenzie et al. (2018) – titled *Automated Vehicles and the Readiness of Western Australian Roads* – used two trial vehicles equipped with commercial LDW technology to assess various line markings and road edges on rural roads in Western Australia (WA). Data was collected at nine sites and the results showed 81 percent (154 of 189) of line-crossing events gave an accurate warning. The 35 failures in warnings were attributed to the absence of marked lines (25 warning failures), too low a travel speed for the LDW system (17 warning failures), and/or the daylight brightness level being low (5 warning failures). One warning failure in the dataset was unexplained.

The present report represents Phase 2 of the Autonomous Vehicles study and is a direct follow-on from the report by Mackenzie et al. (2018). The work of Mackenzie et al. (2018) was extended by meeting several recommendations that were made for future studies. Specifically, the on-road trial in rural and remote areas of WA was repeated in night-time and day-time conditions in order to investigate the effects of low light, and the sample size of line-crossing events was increased.

Additionally, it is possible that a type of red dust found in Northern WA, called red pindan, may have an effect on the quality of road lane markings and the ability of LDW technology to detect them. Red pindan has a reputation for changing the

appearance of white lane markings to a faded pink colour. Consequently, road sites where red pindan was present were included in the on-road trial.

1.1 Aims and objectives

Overall, the specific objectives of the present project were to:

- Undertake an on-road trial of the positional sensitivity of LDW systems on 19 remote WA road sections.
- Complete the testing during day-time and night-time conditions, and in the presence of red pindan.
- Make recommendations regarding the performance, suitability and/or the need for upgrades of road infrastructure to support vehicles with LDW technology in regional WA.

2 METHODS

2.1 Ethics approval

Ethics approval was not required for this study as it did not directly involve human subjects.

2.2 Risk assessments

Separate risk assessments were performed for the three major on-road activities performed during this study. These activities were:

- Driving to, from, and between trial sites;
- Performing the evaluation at each trial site; and
- Conducting the LDW trials at each test location.

These risk assessments (shown in Appendix A) were initially generated by researchers at CASR, refined after the familiarisation activity, and then subsequently reviewed by project stakeholders at Curtin Monash Accident Research Centre (C-MARC) and Main Roads Western Australia (MRWA).

2.3 Trial vehicle

A commercially available compact SUV passenger vehicle was utilised for the purpose of assessing the lane markings at the trail sites described below. The vehicle was a 2018 model and was provided (in-kind) by a manufacturer on the condition that it remain anonymous during the reporting of the study results. Some of the images in this report have been blurred to prevent the identification of the vehicle make or model.

2.3.1 Trial vehicle lane departure warning system

The trial vehicle was equipped with a modern lane support system that included a LDW feature. The system used a camera mounted on the front windshield. It was unknown whether the camera operated in full colour or grey-scale. The user manual noted that the lane support system may have difficulty in conditions where:

- Lane markings are worn or faded;
- Lane markings are difficult to distinguish from the colour of the road;
- Markings on the road surface appear to be a lane marking;

- Lane markings are merged or divided;
- The number of lanes increases or decreases;
- Lane markings are crossing complicatedly;
- There are more than two lane markings in front of the vehicle;
- Lane markings are very thick or thin;
- Lane markings are not visible due to rain, snow, water on the road;
- Lane markings are not visible due to damaged or stained road surfaces;
- There are shadows over the lane markings;
- The lane markings are incomplete;
- The lane markings suddenly disappear;
- The brightness outside suddenly changes;
- The brightness outside is too low;
- Light is reflected off a puddle that is covering the lane markings;
- The field of view is obstructed by sun glare;
- There is not enough distance between the trial vehicle and the vehicle in front;
- Excessive vibration is present while driving from adverse road conditions;
- The camera temperature is too high due to direct sunlight; and
- Heavy rain, fog or snow is impeding the functionality of the camera.

The user manual also reported that the system has a travel speed requirement of between 60 and 180 km/h for full functionality.

From the driver's perspective (shown in Figure 2.1), the lane departure warnings were visually presented on both the dashboard and a heads-up display (a transparent display that presents data without requiring users to look away from the road ahead). On the dashboard, a small icon was visible which flashed when line-crossing events occurred. On the heads-up display, two line-icons were visible which also flashed in the event of a line-crossing event. The line icons on the heads-up display flashed according to which side the line-crossing event occurred, i.e. the left line flashed for an edge line crossing, and the right line flashed for a centreline crossing.

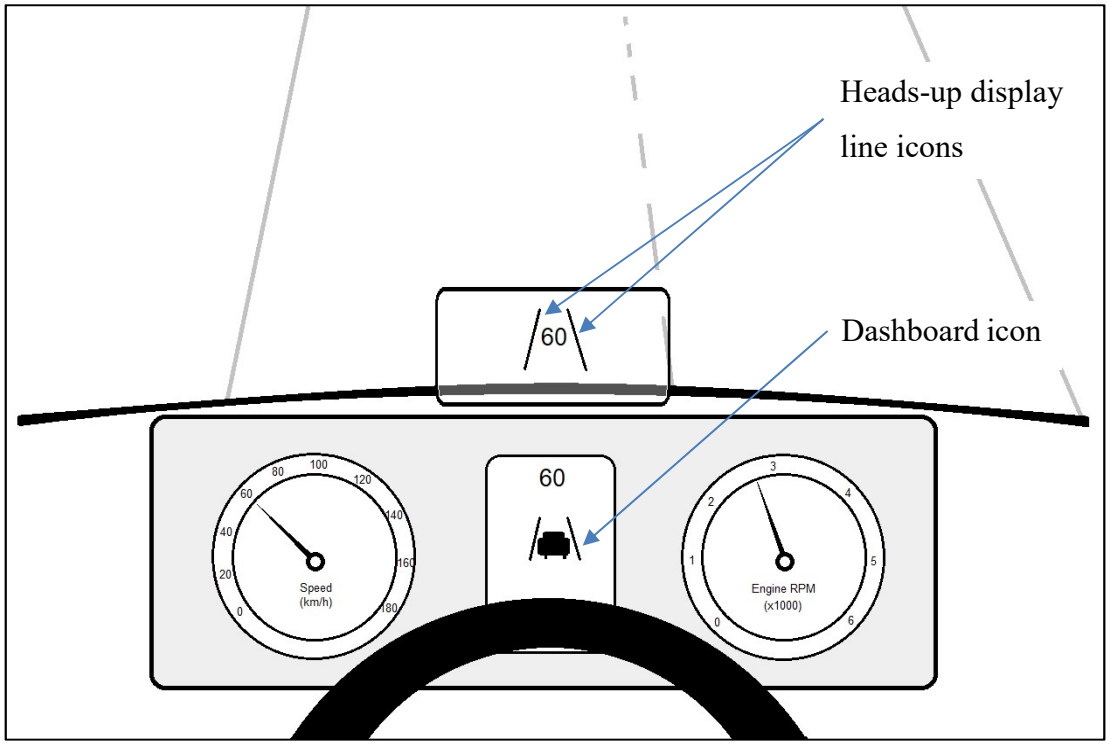

Figure 2.1 Driver's view of dashboard and heads-up display

2.4 Test equipment

The test equipment used in the project is outlined below.

2.4.1 Video VBOX HD2

A Racelogic Video VBOX HD2 data logger (Racelogic, 2018) was utilised as the main data collection system. The VBOX system is equipped with two 1080p video cameras with real-time synchronisation to data collected by a GPS engine operating at 10 Hz. The video streams from both cameras are recorded and can be further enhanced with graphical overlays showing information collected by the GPS engine.

For this study, one of the cameras was positioned to capture images of the vehicle instrument panel, where the lane departure warning alerts would appear, and another camera was positioned to capture either the left or right front wheel, such that a line-crossing event could be observed. An image of this camera layout can be seen in Figure 2.2. Also note the graphical overlay, in bright green, which shows details of the current vehicle speed, date, time, and filename, along with calibrated lines which display the lateral distance from the edge of the wheel.

The lines placed onto the graphical overlay were calibrated using a scale consisting of a set of four parallel lines set 500 mm apart from each other, which was placed parallel to the left or right tyre while the steering wheel was positioned in a neutral (straight ahead) position. Measurements were taken to ensure the calibration board was aligned parallel to the vehicle longitudinal centreline. The zero point of the scale was positioned such that it indicated the outermost edge of the tyre wall; usually the bulge of the tyre, rather than where the tyre makes contact with the road. Once the scale was positioned (see Figure 2.3), the lines were traced onto the graphical overlay along with text indicating the lateral distance between each line and the edge of the tyre as seen in Figure 2.2.

The vehicle speed, date, and time (in Australian Western Standard Time) were sourced from the GPS signal collected by the VBOX. Along with the video data, the system also recorded several other variables, such as acceleration, GPS position and heading angle. The VBOX also had an input for a microphone which was placed inside the vehicle and was utilised for recording which section of road was being tested and when an event occurred. All data collected by the VBOX was recorded onto an SD card for later retrieval.

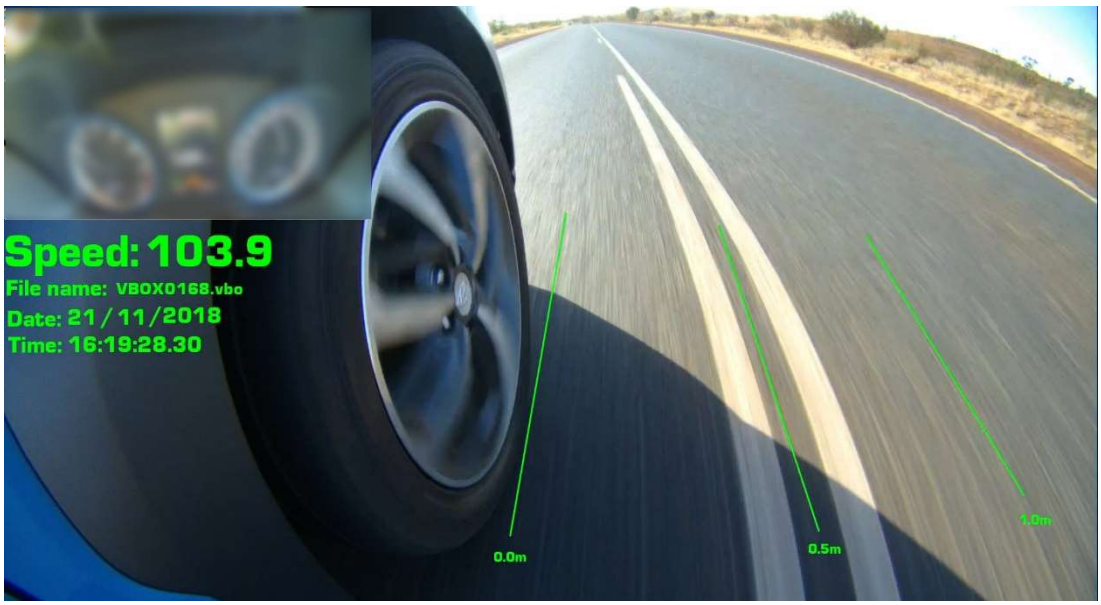

Figure 2.2 Camera layout used to record line-crossing events

Figure 2.3 Camera overlay being aligned using scale

2.4.2 QM-1584 digital light meter

A QM-1584 digital light meter was used to measure the current level of light (in lux) at the trial sites. This measure of daylight brightness provided an indication of the available light, which aids the cameras on the LDW system to detect lane markings.

2.4.3 Torch for night testing

An LED torch was utilised to provide light for the VBOX camera during night testing. The light from the torch was used solely to provide illumination of the wheel for the camera during line-crossing events. No light from the torch was able to be seen within the forward path of the vehicles and thus it was not able to assist the LDW system. The headlights of the trial vehicle were used during night testing and were switched between high beams and low beams for the duration of each test according to oncoming traffic. The torch was attached to the side of the car using suction mounts and had a secondary safety string attached to the side mirror of the vehicle in case the suction cups detached. The configuration of the torch is shown in Figure 2.4.

Figure 2.4 Torch configuration to illuminate camera view

2.4.4 Faro Scanner

A Faro S70 3D laser scanner (shown in Figure 2.5) was used to capture a 3D scene of each trial site for later analysis. The scanner records a 3D point cloud (example shown in Figure 2.6) from the surrounding surfaces. The recorded scans were used to determine the measurements of the road features at each site, such as shoulder widths, line widths and lane widths.

Figure 2.5 Faro S70 Scanner positioned on the side of a road

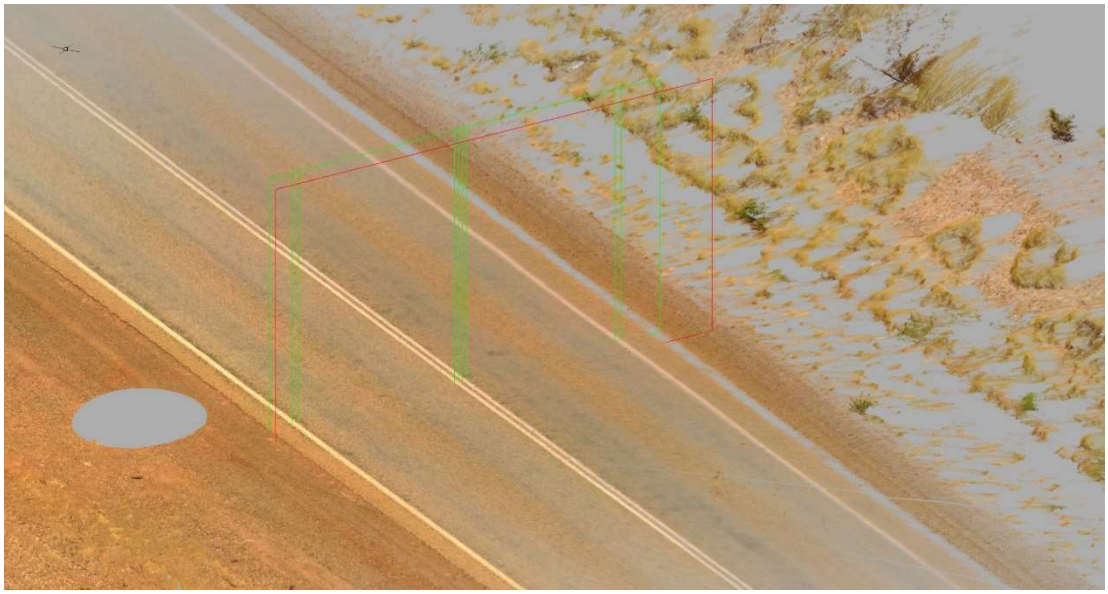

Figure 2.6 3D point cloud used to measure lane marking dimensions

2.5 Data collection procedure

The procedures that were followed for data collection during the on-road trials are described below. A familiarisation activity is detailed, followed by two separate procedures defined for the main activities involved in the trial: the evaluation of the trial sites, and the performing of line-crossing events.

The data collection occurred during November 2018. The weather was typical of that time of year with temperatures ranging from 25°C to 41°C and generally clear sunny days. The field-work team started the testing close to Newman and travelled north along the Great Northern Highway to Port Hedland, collecting data at the sites along the way.

2.5.1 Familiarisation activity

To assist the field-work team's expertise with the testing equipment and data collection procedures, a familiarisation activity was performed. This activity consisted of fitting a vehicle with the Video VBOX HD2 cameras, calibrating the cameras, travelling to a private test track, performing a mock site survey, and then performing several practise crossing events across a solid and dashed centreline. During each task, the requirements of the relevant risk assessments were observed. The familiarisation activity allowed the field-work team to:

- Evaluate the appropriateness and practicality of the risk assessments, then make amendments where necessary;
- Determine the time required for equipment set-up, site evaluation, and to perform each crossing event assessment;
- Assess the data collection procedure and identify any gaps or limitations to make improvements; and
- Practise the site evaluation and crossing event procedure to enable more efficient performance during the real study.

The learnings from the familiarisation activity contributed to the final data collection procedures described below and the final risk assessments shown in Appendix A.

2.5.2 Site evaluation

At the planned remote trial sites, the following procedures were undertaken. First, the field-work team arrived at the site during daylight hours and the site was inspected and assessed for safety. This included identifying safe places to turn around following a trial run in each travel direction, identifying an appropriate location to set-up the test equipment, and checking the width of the shoulders were sufficient for safe line-crossing events. As each site was assigned a line type by MRWA, the start and end points were determined and recorded based on the nearby changes in line types (e.g. from a broken separation line to a double one-way barrier line). Most of the sites had one consistent line type. A portion of the site was then scanned using the Faro Scanner, with the recordings stored for later analysis. Photographs of the site, looking along each individual lane marking were also taken. After the preceding steps were completed, the line-crossing events began.

As the site evaluations were all assessed during daylight hours, the field-work team did not repeat the same evaluation process at night. Instead, the team travelled the length of the site to assess for any immediate and obvious dangers, then proceeded with the line-crossing events.

2.5.3 Line-crossing events

The line-crossing event data were collected in ‘runs’. A run consisted of the trial vehicle traversing the trial site in one direction. For each run, either the centreline or the edge line was chosen as the line of interest.

Prior to a run the field-work team recorded the date, time of day, daylight brightness, temperature (as indicated by the vehicle dashboard), and (on a subjective basis) any particular aspects of interest for the run, such as sun glare. The VBOX system was then set to record and the run was started.

All runs were performed in the absence of other vehicles in the general vicinity, either in the same lane (leading or following) or in the opposite (oncoming) lane. If another vehicle entered the vicinity of the test area while a run was in progress (as outlined below), the run was paused temporarily or aborted and repeated once the test area was clear.

At the beginning of the run, the driver would accelerate the trial vehicle close to the speed limit at the trial site then start the process of obtaining line-crossing event data. This involved the driver making an attempt to cross over the lane marking of interest; deemed to be a 'line-crossing event'. Each crossing event was preceded by a short period spent travelling straight ahead near the centre of the travel lane. To initiate the crossing event the driver steered gently toward the line, rotating the steering wheel by no more than a few degrees. Typically, the driver would allow the wheel of the trial vehicle to cross over the line by somewhere between 50 mm and an entire tyre width. Once a crossing event was completed the driver steered the vehicle back to the centre of the travel lane and either commenced another crossing event or ended the run by pulling over (and halting the VBOX).

During each crossing event, the response of the trial vehicle's LDW system was noted. A positive response was recorded if the LDW system triggered a warning (buzzer and flashing dashboard icon) within a short distance of the vehicle's tyre crossing the line. A negative response was recorded if no warning was triggered. Instances of false positive events, where a warning was triggered despite the vehicle not crossing a lane marking, were also recorded and are discussed in the results.

2.6 Data processing

The data processing was performed after all the data collection had been completed.

All video footage was analysed, and the details of all crossing events were catalogued into a database. The variables coded included the travel speed (as measured by the GPS equipment), date, time of day, line type being tested, travel direction, and whether a warning was activated (i.e. positive or negative result).

Temperature, daylight brightness data, and any abnormalities (e.g. sun glare) were also recorded in the database for each run.

2.7 Trial sites

A long stretch of road was identified by MRWA as a suitable representation of typical remote road conditions in WA. The identified route ran between Capricorn and Port Hedland on the Great Northern Highway. The southern-most site location was approximately 1,100 kilometres North-North-East of Perth. This route was selected due to the following favourable characteristics:

- Low traffic volumes, which reduced the potential for interaction between the field-work team and other road users;
- Sections of the route had received road resurfacing treatments within the past few years and were consequently in good condition;
- A significant number of straight sections (typically 100 m to 1,000 m in length) along the route provided favourable conditions for conducting the crossing events and safer night testing;
- There was a mixture of typical lane marking types including barrier, double-barrier, broken, and audio-tactile;
- There was some variation in posted speed limits; and
- There was an opportunity to assess locations where red pindan dust covered the roads, causing some of the white lines to fade to a light pink colour.

A total of 19 sites were selected for daylight testing, with 14 of those also selected for night testing. Not all sites were tested at night due to time constraints. The selected sites enabled the assessment of the following lane markings:

- Broken separation lines;
- Double one-way barrier lines (broken in direction of travel);
- Double one-way barrier lines (barrier in direction of travel);
- Double two-way barrier lines;
- Conventional edge lines;
- Audio-tactile longitudinal edge lines; and
- Conventional edge line with continuity line sections.
- Broken edge and centrelines;
- Barrier-broken centrelines;
- Broken-barrier centrelines;
- Double-barrier centrelines;
- Single-barrier edge and centrelines; and
- Audio-tactile edge lines.

The locations of the trial sites are displayed in the map shown in Figure 2.7 and are labelled 1 to 19. Each of the trial sites are described below with details regarding the location, lane markings, and lane layouts. A summary of the lane markings at each trial site with their respective reasons for being tested is provided in Table 2.1. Each

of the sites are located with a straight line kilometre (SLK) reference. This SLK reference has its origin at the intersection of Great Northern Highway with Reid Highway and Roe Highway in Middle Swan, Western Australia (metropolitan Perth). The SLK increases when travelling northbound. All the sites were located on the Great Northern Highway.

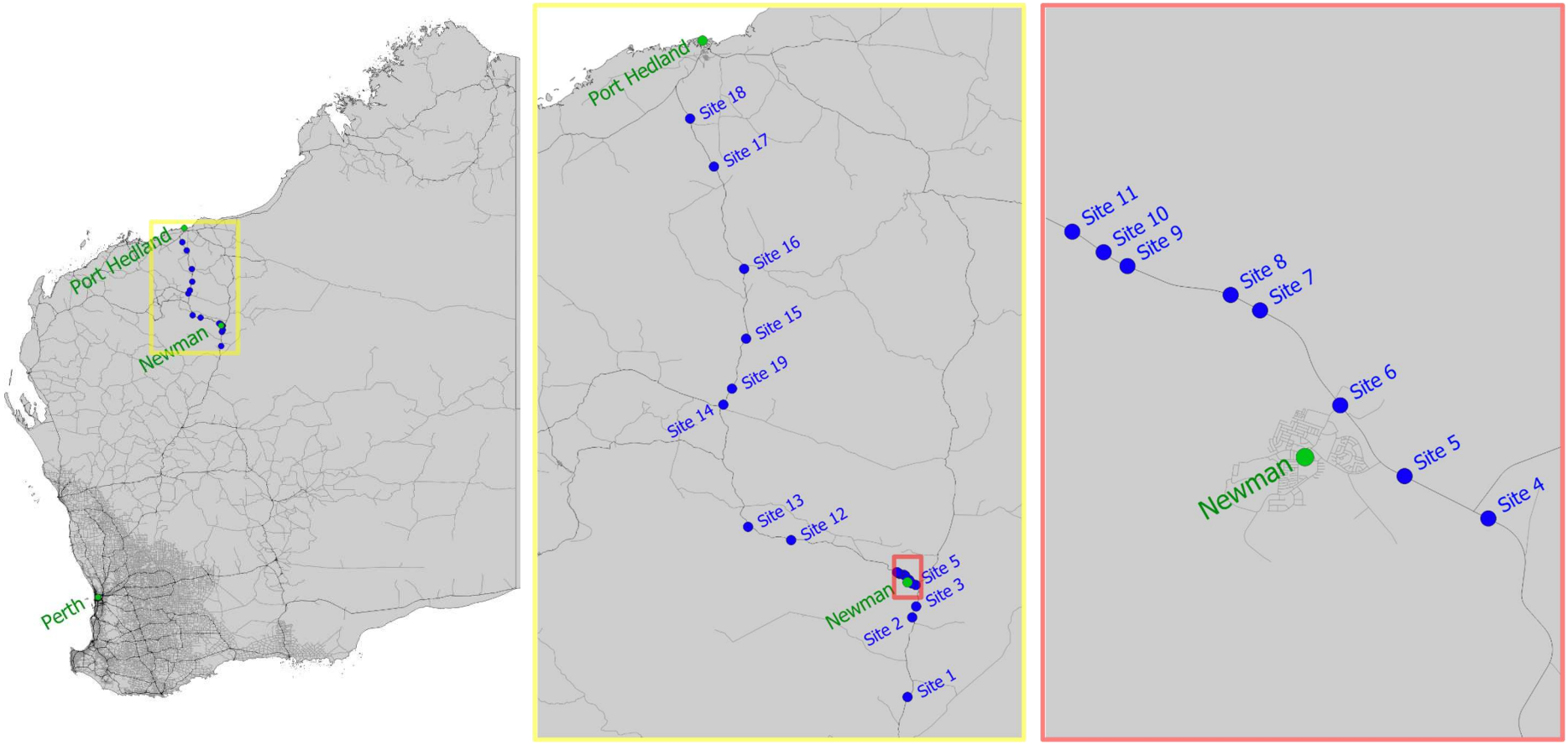

Figure 2.7 **Locations of trial sites**

Table 2.1 Summary of trial sites lane markings

Site	Night tested	Centreline type	Edge line type	Reason for selection
1	Yes	Double one-way barrier	Conventional edge line	Line type
2	Yes	Double one-way barrier	Conventional edge line	Light red pindan
3	Yes	Broken separation line	Conventional edge line	Light red pindan
4	Yes	Complex mixture	Edge line with continuity sections	Painted median
5	Yes	Double two-way barrier line	Edge line with continuity sections	Line type
6	Yes	Complex mixture	Audio-tactile longitudinal edge line	Audio-tactile characteristics
7	Yes	Broken separation line	Conventional edge line	Light red pindan and faded edge line due to heavy vehicles
8	Yes	Double two-way barrier line	Conventional edge line	Light red pindan and faded edge line due to heavy vehicles
9	Yes	Double one-way barrier	Conventional edge line	Light red pindan and faded edge line due to heavy vehicles
10	Yes	Double one-way barrier	Edge line with continuity sections	Light red pindan and severely faded edge line due to heavy vehicles
11	Yes	Double one-way barrier	Audio-tactile longitudinal edge line	Light red pindan and audio-tactile characteristics
12	No	Double one-way barrier	Audio-tactile longitudinal edge line	Light red pindan and audio-tactile characteristics
13	No	Double two-way barrier line	Conventional edge line	Red pindan
14	Yes	Broken separation line	Conventional edge line	Red pindan
15	No	Double two-way barrier line	Audio-tactile longitudinal edge line	Red pindan
16	No	Double two-way barrier line	Conventional edge line	Faded edge line
17	Yes	Broken separation line	Conventional edge line	Faded edge line
18	Yes	Double two-way barrier line	Conventional edge line	Red pindan
19	No	Broken separation line	Conventional edge line	Light red pindan and very faded edge line due to heavy vehicles

2.7.1 Site 1: Great Northern Highway – SLK 1,085.79

Site 1 has a double one-way barrier centreline (broken in southbound direction) and conventional edge lines. This site was selected for its line type. The shoulder widths for most of the site were deemed inadequate for safe line-crossing events, but the field-work team found a small section where a wide enough sealed shoulder existed to complete the testing. There were no defects noticed with the line quality, and the time of day that testing occurred meant there were some shadows from nearby foliage that covered some edge lines. During the night testing, the lane markings were clear.

A collage of photographs taken at the site is shown in Figure 2.8, a 3D scan of the site is shown in Figure 2.9, the dimensions of the road are shown in Table 2.2, and specific location details are shown in Table 2.3.

Figure 2.8 Site 1 photographs – facing southbound

Figure 2.9 Site 1 3D point cloud

Table 2.2 Road dimensions measured at Site 1

Element	Width (mm)
Southbound sealed shoulder	97
Southbound edge line	125
Southbound lane	3,539
Broken side of double one-way barrier centreline (southbound side)	74
Gap between centrelines	105
Barrier side of double one-way barrier centreline (northbound side)	76
Northbound lane	3,180
Northbound edge line	102
Northbound sealed shoulder	418

Table 2.3 Site 1 location details

Start GPS Coordinates	S 24° 0' 14.256"	E 119° 44' 12.551"
End GPS Coordinates	S 24° 0' 8.712"	E 119° 44' 15.467"
Site length	0.19 km	

2.7.2 Site 2: Great Northern Highway – SLK 1,139.49

Site 2 has a double one-way barrier centreline (broken in southbound direction) and conventional edge lines. The site was specifically chosen due to its reported red pindan presence, however, the field-work team noted that the red pindan was not obvious. The sealed shoulders at this site were a different colour bitumen to the lanes. It was considered that the LDW system may have registered the change in bitumen colour as a lane marking itself, but this was not the case. During night testing, the lane markings were clear.

A collage of photographs of the site is shown in Figure 2.10, a site 3D scan is shown in Figure 2.11, the dimensions of the road are shown in Table 2.4, and specific location details are shown in Table 2.5.

Figure 2.10 Site 2 photographs – facing northbound

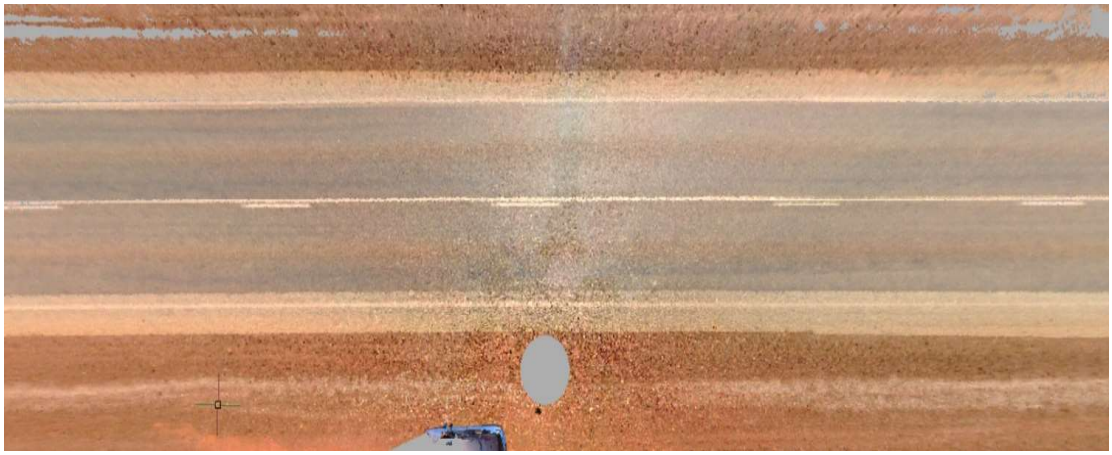

Figure 2.11 Site 2 3D point cloud

Table 2.4 Road dimensions measured at Site 2

Element	Width (mm)
Southbound sealed shoulder	892
Southbound edge line	132
Southbound lane	3,354
Broken side of double one-way barrier centreline (southbound side)	78
Gap between centrelines	100
Barrier side of double one-way barrier centreline (northbound side)	71
Northbound lane	3,320
Northbound edge line	124
Northbound sealed shoulder	948

Table 2.5 Site 2 location details

Start GPS Coordinates	S 23° 33' 22.392"	E 119° 45' 42.983"
End GPS Coordinates	S 23° 33' 13.752"	E 119° 45' 40.968"
Site length	0.27 km	

2.7.3 Site 3: Great Northern Highway – SLK 1,146.96

Site 3 has a broken separation centreline and conventional edge lines. The site was located on a long stretch of a straight road. It was selected due to the presence of red pindan, which was noticeable by the field-work team. The lane markings were not as distinguished as others tested. The change of bitumen colour was also noted as an interesting observation, with the change of colour occurring along the edge lines. During night testing however, the lane markings were clear and the change of bitumen colour for the shoulders of the road were not obvious.

A collage of photographs of the site is shown in Figure 2.12, a site 3D scan is shown in Figure 2.13, the dimensions of the road are shown in Table 2.6, and specific location details are shown in Table 2.7.

Figure 2.12 Site 3 photographs – facing northbound

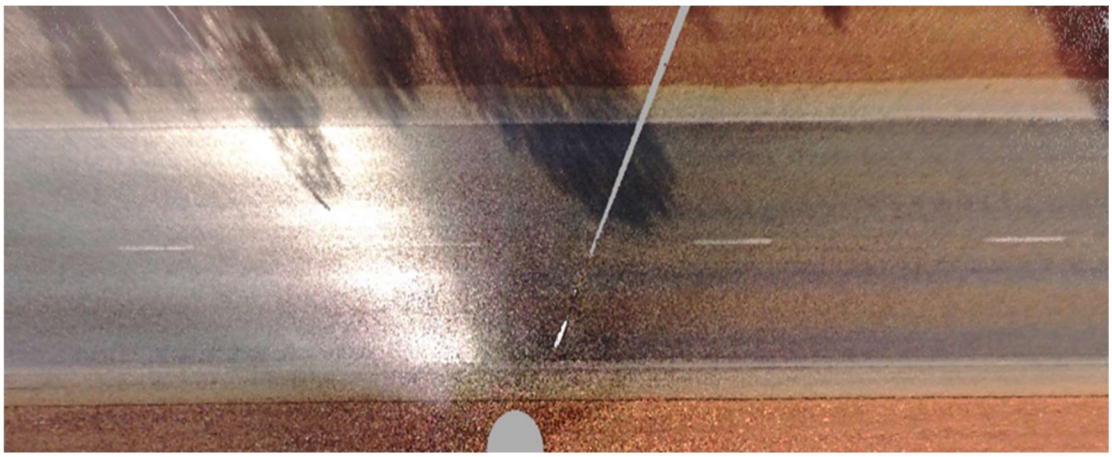

Figure 2.13 **Site 3 3D point cloud**

Table 2.6 **Road dimensions measured at Site 3**

Element	Width (mm)
Southbound sealed shoulder	832
Southbound edge line	180
Southbound lane	3,389
Broken separation centreline	74
Northbound lane	3,350
Northbound edge line	153
Northbound sealed shoulder	985

Table 2.7 **Site 3 location details**

Start GPS Coordinates	S 23° 29' 38.292"	E 119° 47' 4.055"
End GPS Coordinates	S 23° 29' 24.468"	E 119° 47' 12.119"
Site length	0.50 km	

2.7.4 Site 4: Great Northern Highway – SLK 1,162.53

Site 4 has a complex mixture of centrelines including median sections, turning lane lines and double two-way barrier lines. The edge lines are also varied with sections of conventional, continuity sections and audio-tactile longitudinal edge lines. This site was chosen because it has a painted median and complex layout. The lane markings were clear during day and night testing, and the road had shoulder widths suitable for line-crossing testing.

A site 3D scan is shown in Figure 2.14, the dimensions of the road are shown in Table 2.8, specific location details are shown in Table 2.9, and a collage of photographs of the site is shown in Figure 2.15 linked to a map layout of the site (not to scale).

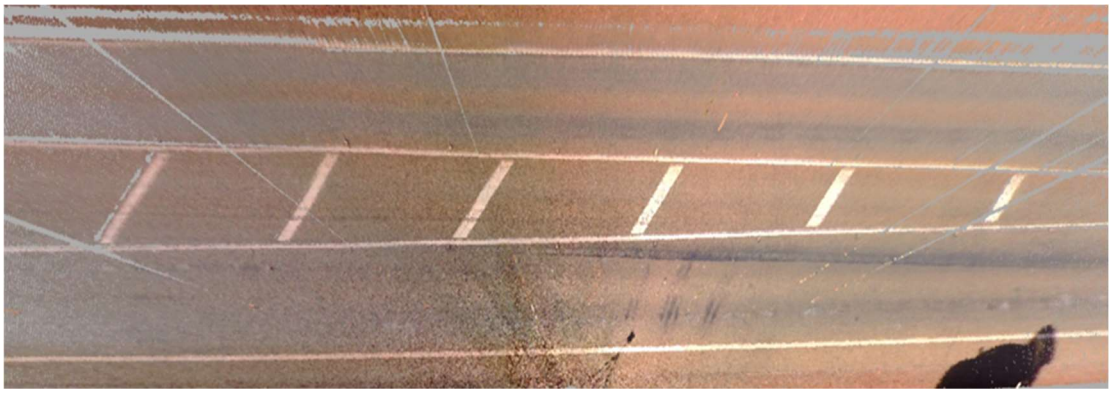

Figure 2.14 Site 4 3D point cloud

Table 2.8 Road dimensions measured at Site 4

Element	Width (mm)
Southbound sealed shoulder	1,113
Southbound edge line	91
Southbound lane	3,647
Double two-way barrier centreline (southbound side)	102
Gap between double centrelines	100 to 3,600
Double two-way barrier centreline (northbound side)	174
Northbound lane	3,806
Northbound edge line	151
Northbound sealed shoulder	3,695

Table 2.9 Site 4 location details

Start GPS Coordinates	S 23° 22' 30.252"	E 119° 46' 54.911"
End GPS Coordinates	S 23° 22' 20.748"	E 119° 46' 35.219"
Site length	0.65 km	

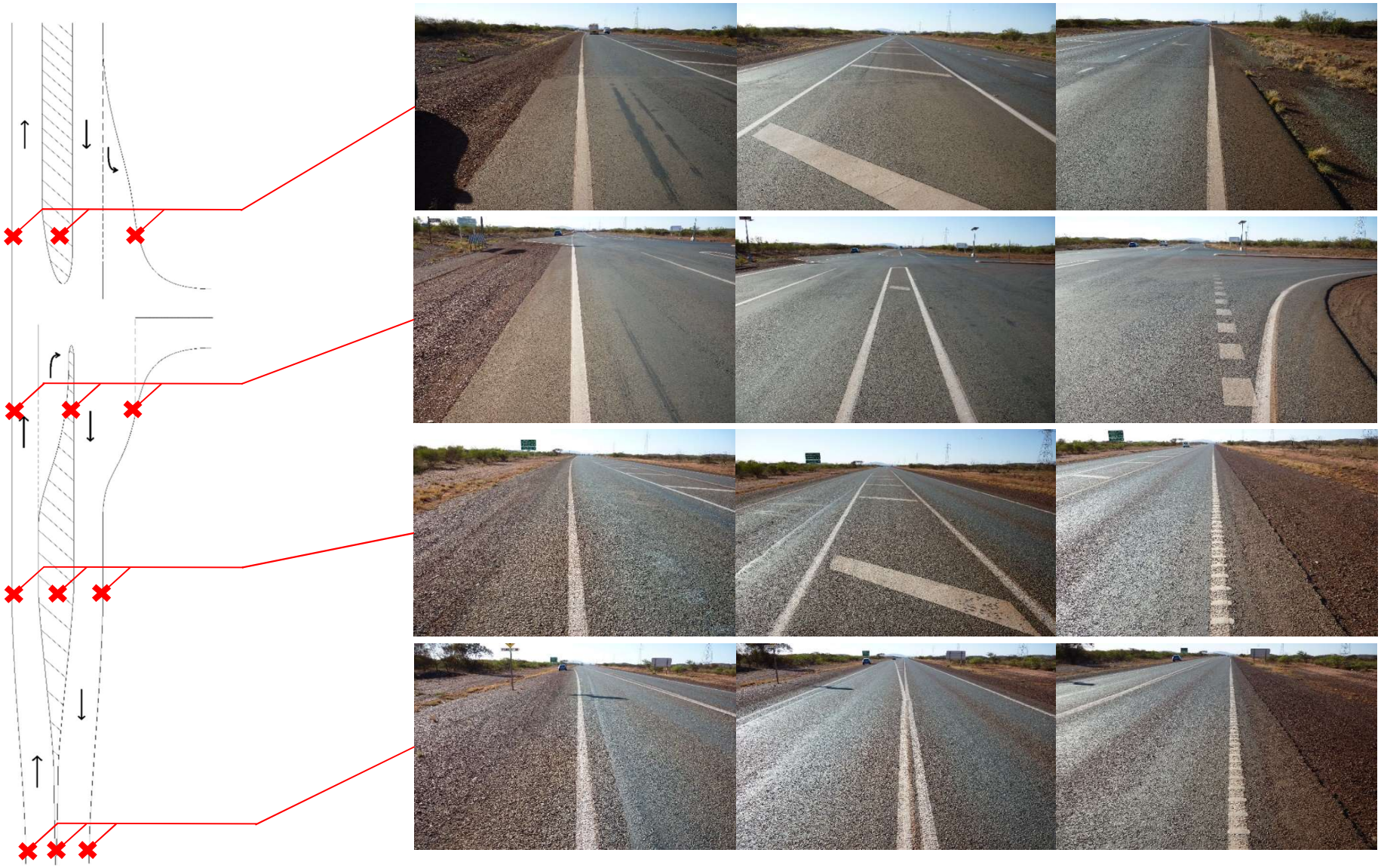

Figure 2.15 **Site 4 photographs and layout map – facing northbound**

2.7.5 Site 5: Great Northern Highway – SLK 1,164.73

Site 5 has a double two-way barrier centreline with gaps, and audio-tactile longitudinal edge lines with continuity (broken) line sections for entries to rest areas. It was chosen specifically for the change in line type between audio-tactile and continuity lines and the gaps between double two-way barrier centreline sections. Interestingly, there were some large tyre marks noted by the field-team at this site, as can be seen on the site scan. The road had some changes in bitumen colour, but the lines were clear throughout day and night testing.

A collage of photographs of the site is shown in Figure 2.16, a site 3D scan is shown in Figure 2.17, the dimensions of the road are shown in Table 2.10, and specific location details are shown in Table 2.11.

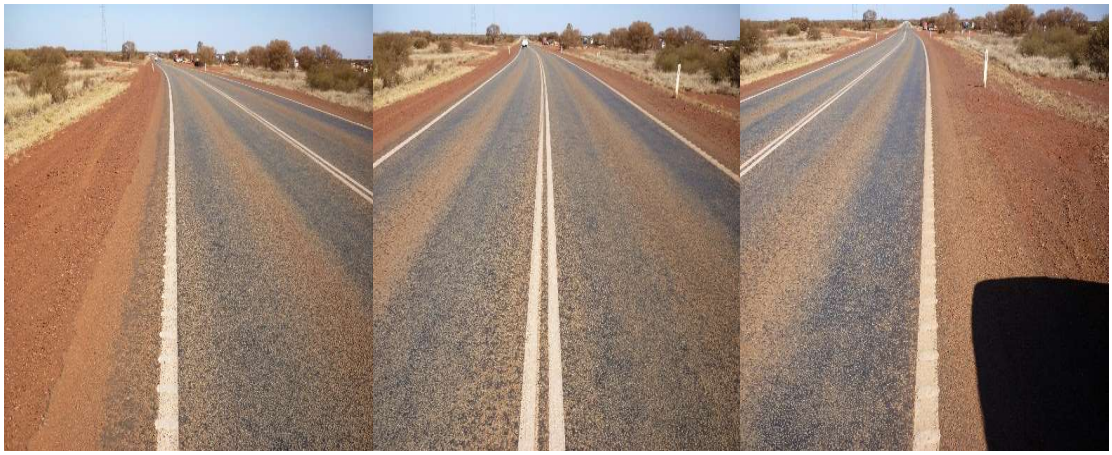

Figure 2.16 Site 5 photographs – facing southbound

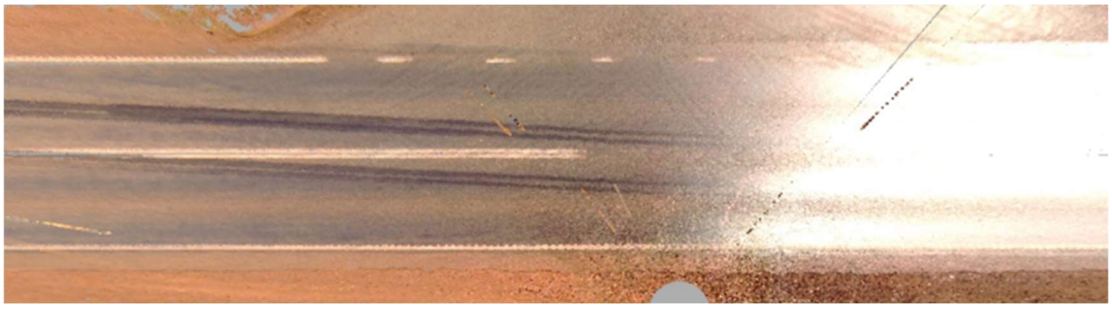

Figure 2.17 Site 5 3D point cloud

Table 2.10 Road dimensions measured at Site 5

Element	Width (mm)
Southbound sealed shoulder	765
Southbound edge line	126
Southbound lane	3,341
Double two-way barrier centreline (southbound side)	85
Gap between double centrelines	120
Double two-way barrier centreline (northbound side)	71
Northbound lane	3,402
Northbound broken edge line	87
Northbound sealed shoulder	479

Table 2.11 Site 5 location details

Start GPS Coordinates	S 23° 21' 51.156"	E 119° 45' 37.655"
End GPS Coordinates	S 23° 21' 44.424"	E 119° 45' 23.831"
Site length	0.45 km	

2.7.6 Site 6: Great Northern Highway – SLK 1,167.35

Site 6 has a complex mixture of centrelines including double two-way barrier, broken separation lines and median sections, with audio-tactile longitudinal edge lines. The site was selected for its audio-tactile longitudinal edge lines. This site also contained multiple pseudo lines that seemed to be previous lane markings that were painted over with black paint, causing some issues for the LDW system, which are discussed further in Section 4.3. The white lines at this site were clear to the field-work team both during day and night testing.

A site 3D scan is shown in Figure 2.18, the dimensions of the road are shown in Table 2.12, specific location details are shown in Table 2.13 and a collage of photographs of the site is shown in Figure 2.19 linked to a map layout of the site.

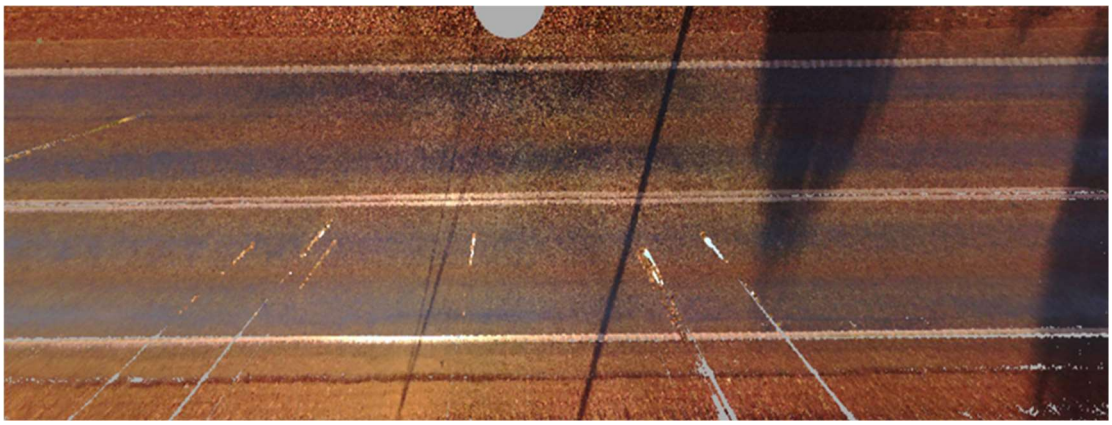

Figure 2.18 Site 6 3D point cloud

Table 2.12 Road dimensions measured at Site 6

Element	Width (mm)
Southbound sealed shoulder	1,077
Southbound edge line	121
Southbound lane	3,540
Double two-way barrier centreline (southbound side)	78
Gap between double centrelines	80
Double two-way barrier centreline (northbound side)	135
Northbound lane	3,290
Northbound edge line	194
Northbound sealed shoulder	747

Table 2.13 Site 6 location details

Start GPS Coordinates	S 23° 20' 45.996"	E 119° 44' 38.831"
End GPS Coordinates	S 23° 20' 37.680"	E 119° 44' 32.243"
Site length	0.30 km	

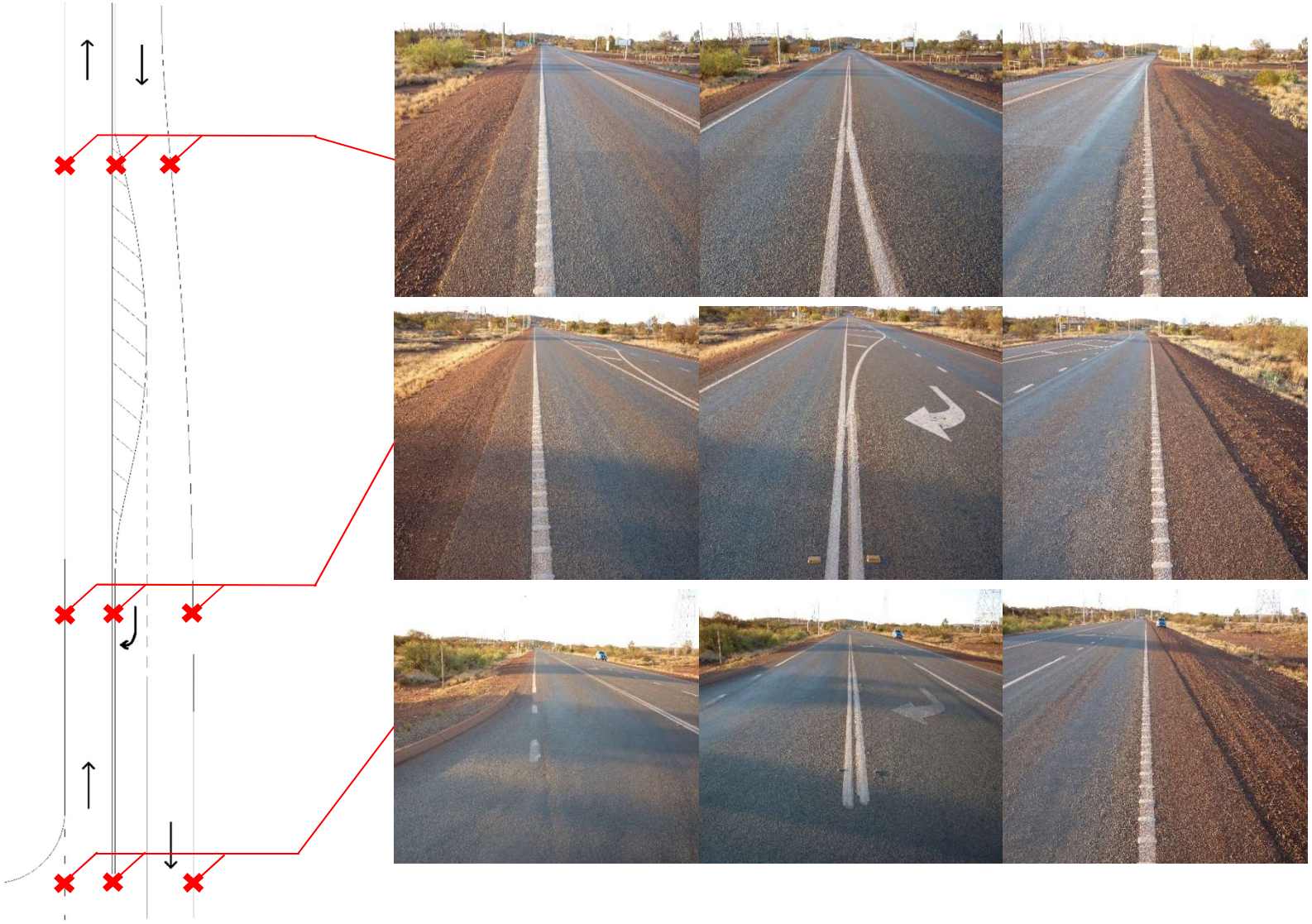

Figure 2.19 **Site 6 photographs and layout map – facing northbound**

2.7.7 Site 7: Great Northern Highway – SLK 1,171.09

Site 7 has a broken separation centreline and conventional edge lines. The site was chosen due to the presence of the red pindan and the faded edge line due to heavy vehicle traffic. The field-work team noted that the northbound edge line was more faded than the southbound edge line. During night testing the faded characteristic in the edge lines was not obvious.

A collage of photographs of the site is shown in Figure 2.20, a site 3D scan is shown in Figure 2.21, the dimensions of the road are shown in Table 2.14, and specific location details are shown in Table 2.15.

Figure 2.20 Site 7 photographs - facing southbound

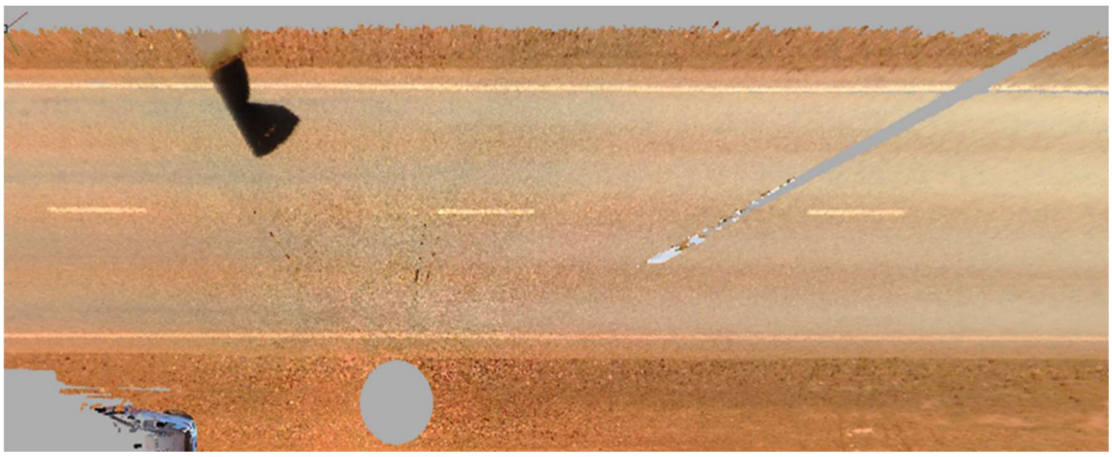

Figure 2.21 Site 7 3D point cloud

Table 2.14 Road dimensions measured at Site 7

Element	Width (mm)
Southbound sealed shoulder	503
Southbound edge line	111
Southbound lane	3,404
Broken separation centreline	91
Northbound lane	3,405
Northbound edge line	116
Northbound sealed shoulder	585

Table 2.15 Site 7 location details

Start GPS Coordinates	S 23° 19' 18.336"	E 119° 43' 24.887"
End GPS Coordinates	S 23° 19' 13.728"	E 119° 43' 16.104"
Site length	0.29 km	

2.7.8 Site 8: Great Northern Highway – SLK 1,172.15

Site 8 has a double two-way barrier centreline with conventional edge lines. It was located on a slightly curved road and selected for the presence of the red pindan and its apparent faded edge line due to heavy vehicle traffic. The field-work team noted that the lines were not as faded as other lines categorised as 'faded'. The lines were clear both during daytime and night time testing. The team also noted that the red pindan was not as strong as at other sites.

A collage of photographs of the site is shown in Figure 2.22, a site 3D scan is shown in Figure 2.23, the dimensions of the road are shown in Table 2.16, and specific location details are shown in Table 2.17.

Figure 2.22 Site 8 photographs – facing southbound

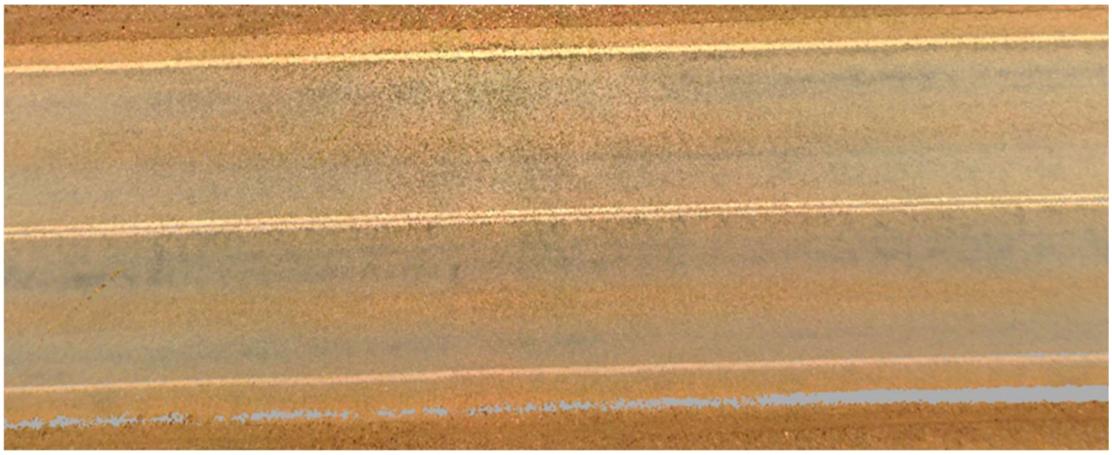

Figure 2.23 Site 8 3D point cloud

Table 2.16 Road dimensions measured at Site 8

Element	Width (mm)
Southbound sealed shoulder	495
Southbound edge line	130
Southbound lane	3,352
Double two-way barrier centreline (southbound side)	102
Gap between double centrelines	76
Double two-way barrier centreline (northbound side)	95
Northbound lane	3,175
Northbound edge line	141
Northbound sealed shoulder	541

Table 2.17 Site 8 location details

Start GPS Coordinates	S 23° 19' 4.044"	E 119° 42' 57.888"
End GPS Coordinates	S 23° 18' 59.76"	E 119° 42' 41.436"
Site length	0.50 km	

2.7.9 Site 9: Great Northern Highway – SLK 1,174.60

Site 9 has a double one-way barrier centreline (broken in the southbound direction) and conventional edge lines. This site was selected for the presence of red pindan and its faded edge lines due to heavy traffic. The road shoulders are narrow and only provided a small distance to perform line-crossing events. The field-work team noted that the lane markings were easy to see, did not seem affected heavily by the red pindan and were not faded during both day and night testing.

A collage of photographs of the site is shown in Figure 2.24, a site 3D scan is shown in Figure 2.25, the dimensions of the road are shown in Table 2.18, and specific location details are shown in Table 2.19.

Figure 2.24 Site 9 photographs – facing northbound

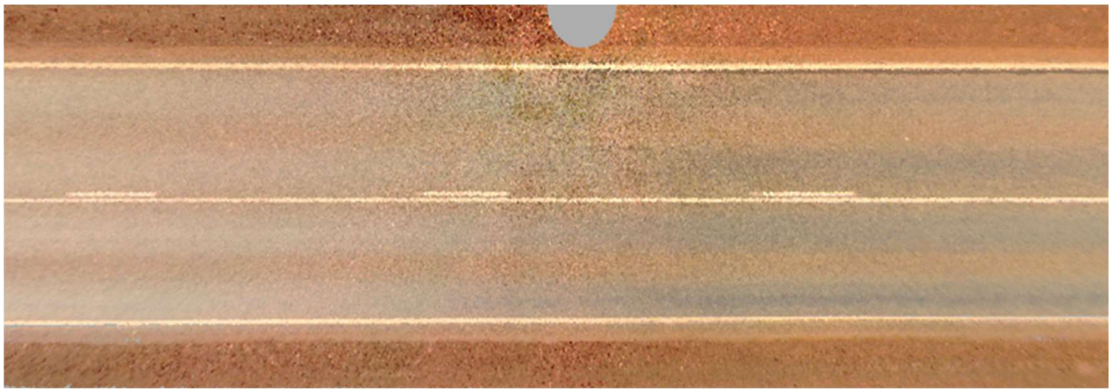

Figure 2.25 Site 9 3D point cloud

Table 2.18 Road dimensions measured at Site 9

Element	Width (mm)
Southbound sealed shoulder	456
Southbound edge line	122
Southbound lane	3,373
Broken side of double one-way barrier centreline (southbound side)	86
Gap between double centrelines	88
Barrier side of double one-way barrier centreline (northbound side)	95
Northbound lane	3,226
Northbound edge line	103
Northbound sealed shoulder	555

Table 2.19 Site 9 location details

Start GPS Coordinates	S 23° 18' 37.476"	E 119° 41' 23.064"
End GPS Coordinates	S 23° 18' 33.948"	E 119° 41' 14.171"
Site length	0.27 km	

2.7.10 Site 10: Great Northern Highway – SLK 1,175.55

Site 10 has a double one-way barrier centreline (broken in the northbound direction) and conventional edge lines. It was chosen for the presence of red pindan and for its severely faded edge lines due to heavy traffic. However, the field-work team noted that the edges were not obviously faded, and that the red pindan was also not very evident. This site also had a rest area entry point for which the edge line transitioned to a broken line for a short distance. The lane markings were clear during both day and night testing.

A collage of photographs of the site is shown in Figure 2.26, a site 3D scan is shown in Figure 2.27, the dimensions of the road are shown in Table 2.20, and specific location details are shown in Table 2.21.

Figure 2.26 Site 10 photographs – facing southbound

Figure 2.27 Site 10 3D point cloud

Table 2.20 Road dimensions measured at Site 10

Element	Width (mm)
Southbound sealed shoulder	592
Southbound edge line	124
Southbound lane	3,457
Barrier side of double one-way barrier centreline (southbound side)	92
Gap between double centrelines	89
Broken side of double one-way barrier centreline (northbound side)	92
Northbound lane	3,233
Northbound edge line	101
Northbound sealed shoulder	576

Table 2.21 Site 10 location details

Start GPS Coordinates	S 23° 18' 24.732"	E 119° 41' 0.996"
End GPS Coordinates	S 23° 18' 18.972"	E 119° 40' 52.932"
Site length	0.29 km	

2.7.11 Site 11: Great Northern Highway – SLK 1,176.53

Site 11 has a double one-way barrier centreline (broken in the southbound direction) and audio-tactile longitudinal edge lines. This site was chosen for the presence of red pindan, and for its audio-tactile longitudinal edge lines. The field-work team noted that the audio-tactile longitudinal edge lines provided a strong vibrating sensation to the vehicle when performing a line-crossing event. The red pindan was not noted to be evident as the lines were clear to the team during day and night time testing.

A collage of photographs of the site is shown in Figure 2.28, a site 3D scan is shown in Figure 2.29, the dimensions of the road are shown in Table 2.22, and specific location details are shown in Table 2.23.

Figure 2.28 Site 11 photographs – facing southbound

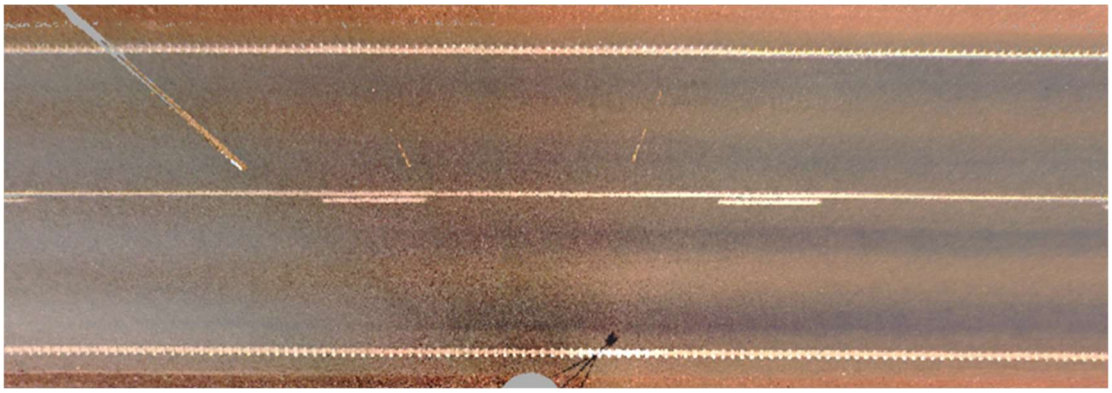

Figure 2.29 Site 11 3D point cloud

Table 2.22 Road dimensions measured at Site 11

Element	Width (mm)
Southbound sealed shoulder	501
Southbound edge line	122
Southbound lane	3,401
Broken side of double one-way barrier centreline (southbound side)	111
Gap between double centrelines	46
Barrier side of double one-way barrier centreline (northbound side)	112
Northbound lane	3,205
Northbound edge line	168
Northbound sealed shoulder	491

Table 2.23 Site 11 location details

Start GPS Coordinates	S 23° 18' 5.508"	E 119° 40' 32.447"
End GPS Coordinates	S 23° 18' 0.828"	E 119° 40' 23.519"
Site length	0.29 km	

2.7.12 Site 12: Great Northern Highway – SLK 1,246.00

Site 12 has a double one-way barrier centreline (barrier in the southbound direction) and audio-tactile longitudinal edge lines. The site was chosen due to the red pindan presence, but the field-work team noted that there was minimal sign of a change in appearance of the line colour. The lane markings were noted to be very evident during day testing, and the shoulder widths were noted as small. There was no night testing completed due to time constraints.

A collage of photographs of the site is shown in Figure 2.30, a site 3D scan is shown in Figure 2.31, the dimensions of the road are shown in Table 2.24, and specific location details are shown in Table 2.25.

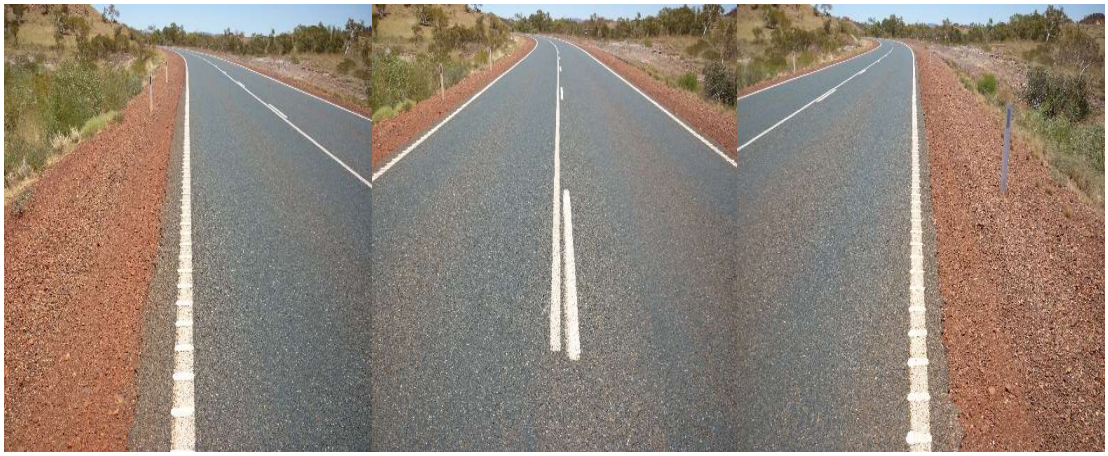

Figure 2.30 Site 12 photographs – facing northbound

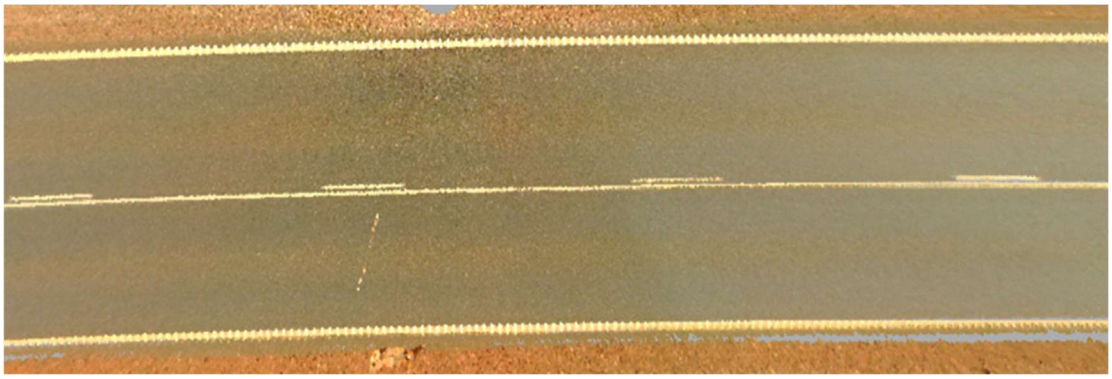

Figure 2.31 Site 12 3D point cloud

Table 2.24 Road dimensions measured at Site 12

Element	Width (mm)
Southbound sealed shoulder	334
Southbound edge line	175
Southbound lane	3,459
Broken side of double one-way barrier centreline (southbound side)	99
Gap between double centrelines	61
Barrier side of double one-way barrier centreline (northbound side)	99
Northbound lane	3,411
Northbound edge line	113
Northbound sealed shoulder	370

Table 2.25 Site 12 location details

Start GPS Coordinates	S 23° 7' 16.032"	E 119° 4' 59.808"
End GPS Coordinates	S 23° 7' 13.008"	E 119° 4' 51.42"
Site length	0.25 km	

2.7.13 Site 13: Great Northern Highway – SLK 1,273.44

Site 13 has a double two-way barrier centreline and conventional edge lines. It was positioned on a long curving road. This site was specifically chosen due to the presence of red pindan dust. However, the field-work team noted that the red pindan was not very apparent and that the lines were clear during day testing. This site was not tested at night.

A collage of photographs of the site is shown in Figure 2.32, a site 3D scan is shown in Figure 2.33, the dimensions of the road are shown in Table 2.26, and specific location details are shown in Table 2.27.

Figure 2.32 Site 13 photographs – facing southbound

Figure 2.33 Site 13 3D point cloud

Table 2.26 Road dimensions measured at Site 13

Element	Width (mm)
Southbound sealed shoulder	621
Southbound edge line	97
Southbound lane	3,522
Double two-way barrier centreline (southbound side)	89
Gap between double centrelines	95
Double two-way barrier centreline (northbound side)	79
Northbound lane	3,341
Northbound edge line	158
Northbound sealed shoulder	226

Table 2.27 Site 13 location details

Start GPS Coordinates	S 23° 2' 47.652"	E 118° 50' 28.32"
End GPS Coordinates	S 23° 1' 51.924"	E 118° 49' 56.387"
Site length	2.10 km	

2.7.14 Site 14: Great Northern Highway – SLK 1,360.50

Site 14 has a broken separation centreline and conventional edge lines. It was on a long straight road with ample sight distance. The shoulder widths were suitable for line-crossing events and the lane markings were clear even though the site was selected for the red pindan presence. Night testing was completed at this site.

A collage of photographs of the site is shown in Figure 2.34, a site 3D scan is shown in Figure 2.35, the dimensions of the road are shown in Table 2.28, and specific location details are shown in Table 2.29.

Figure 2.34 Site 14 photographs – facing southbound

Figure 2.35 Site 14 3D point cloud

Table 2.28 Road dimensions measured at Site 14

Element	Width (mm)
Southbound sealed shoulder	890
Southbound edge line	141
Southbound lane	3,373
Broken separation centreline	97
Northbound lane	3,438
Northbound edge line	164
Northbound sealed shoulder	1,027

Table 2.29 Site 14 location details

Start GPS Coordinates	S 22° 21' 37.908"	E 118° 42' 15.587"
End GPS Coordinates	S 22° 20' 51.612"	E 118° 42' 29.988"
Site length	1.50 km	

2.7.15 Site 15: Great Northern Highway – SLK 1,405.36

Site 15 has a double two-way barrier centreline and audio-tactile longitudinal edge lines. It was chosen for the presence of red pindan, but the field-work team noted that the red pindan was not very evident. The shoulders, however, were a close colour to the dirt on the roadside. The lines were clear to the team during day testing. This site was not tested at night conditions.

A collage of photographs of the site is shown in Figure 2.36, a site 3D scan is shown in Figure 2.37, the dimensions of the road are shown in Table 2.30, and specific location details are shown in Table 2.31.

Figure 2.36 Site 15 photographs – facing southbound

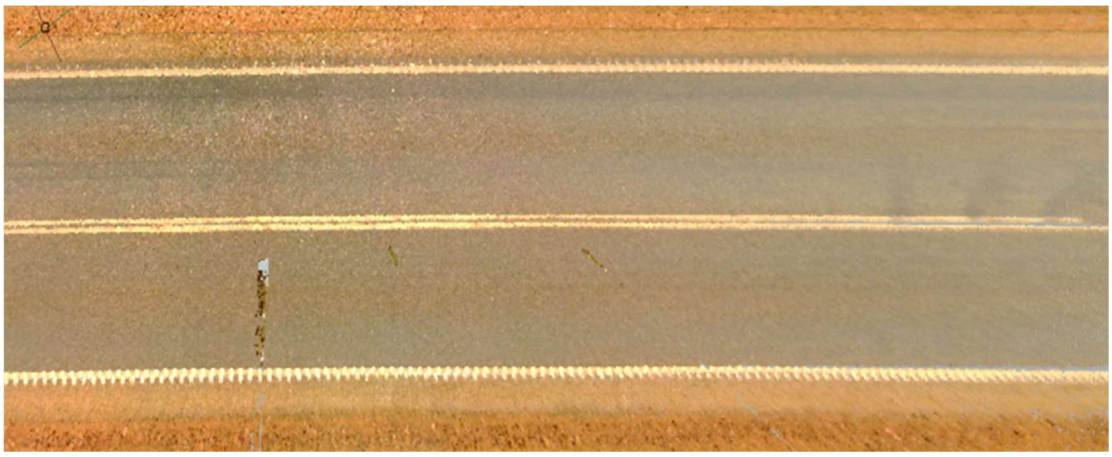

Figure 2.37 Site 15 3D point cloud

Table 2.30 Road dimensions measured at Site 15

Element	Width (mm)
Southbound sealed shoulder	942
Southbound edge line	132
Southbound lane	3,364
Double two-way barrier centreline (southbound side)	95
Gap between double centrelines	99
Double two-way barrier centreline (northbound side)	100
Northbound lane	3,429
Northbound edge line	165
Northbound sealed shoulder	804

Table 2.31 Site 15 location details

Start GPS Coordinates	S 21° 59' 21.552"	E 118° 49' 51.347"
End GPS Coordinates	S 21° 58' 11.712"	E 118° 50' 9.204"
Site length	2.20 km	

2.7.16 Site 16: Great Northern Highway – SLK 1,450.10

Site 16 has a double two-way barrier centreline and conventional edge lines. This site was chosen due to its apparent faded edge line, although the lane markings were noted to be very evident. No night testing was completed for this site.

A collage of photographs of the site is shown in Figure 2.38, a site 3D scan is shown in Figure 2.39, the dimensions of the road are shown in Table 2.32, and specific location details are shown in Table 2.33.

Figure 2.38 Site 16 photographs – facing southbound

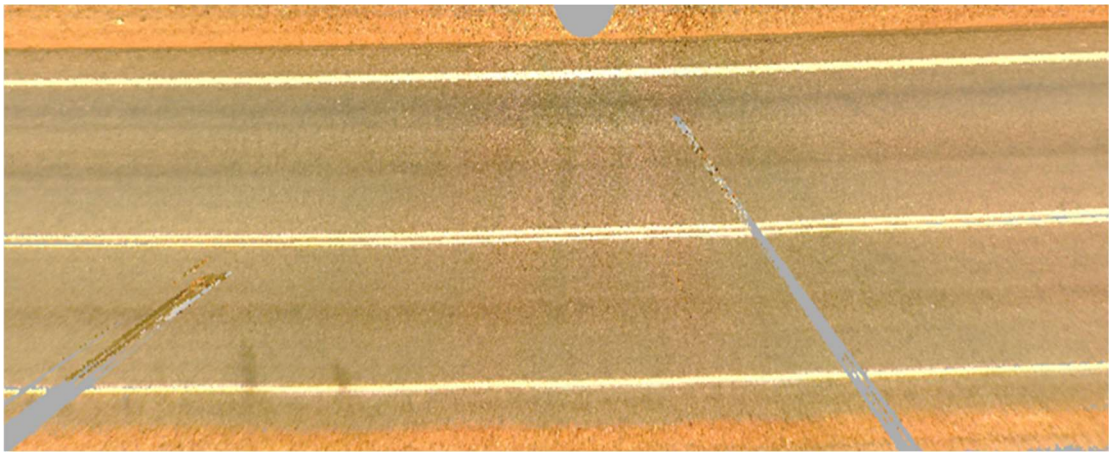

Figure 2.39 Site 16 3D point cloud

Table 2.32 Road dimensions measured at Site 16

Element	Width (mm)
Southbound sealed shoulder	926
Southbound edge line	156
Southbound lane	3,309
Double two-way barrier centreline (southbound side)	81
Gap between double centrelines	73
Double two-way barrier centreline (northbound side)	128
Northbound lane	3,599
Northbound edge line	171
Northbound sealed shoulder	694

Table 2.33 Site 16 location details

Start GPS Coordinates	S 21° 35' 42.720"	E 118° 49' 9.048"
End GPS Coordinates	S 21° 35' 19.032"	E 118° 49' 9.084"
Site length	0.75 km	

2.7.17 Site 17: Great Northern Highway – SLK 1,522.25

Site 17 has a broken separation centreline and conventional edge lines. It was located on a long stretch of straight road and was chosen for its apparent faded edge line. However, the field-work team noted that the lane markings did not seem faded and were very evident during both day and night testing.

A collage of photographs of the site is shown in Figure 2.40, a site 3D scan is shown in Figure 2.41, the dimensions of the road are shown in Table 2.34, and specific location details are shown in Table 2.35.

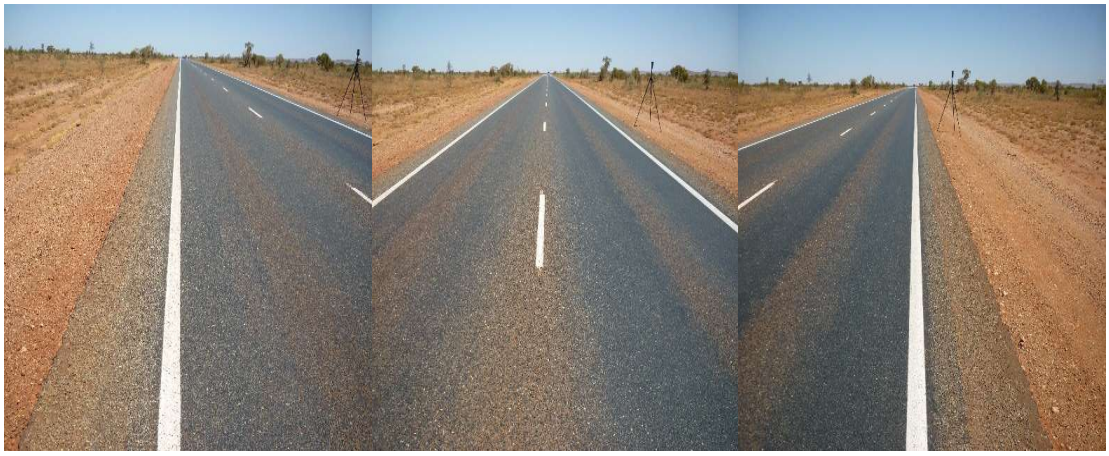

Figure 2.40 Site 17 photographs – facing southbound

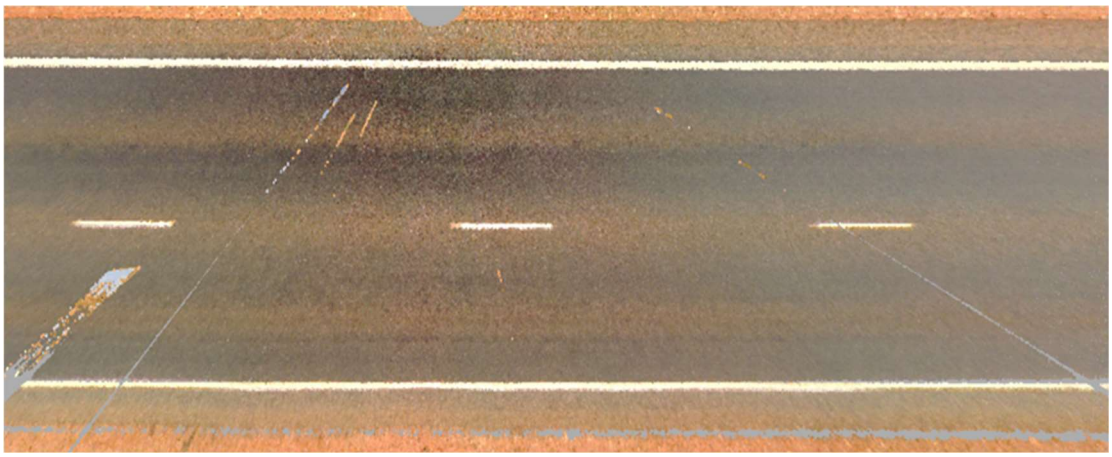

Figure 2.41 Site 17 3D point cloud

Table 2.34 Road dimensions measured at Site 17

Element	Width (mm)
Southbound sealed shoulder	867
Southbound edge line	141
Southbound lane	3,437
Broken separation centreline	99
Northbound lane	3,464
Northbound edge line	167
Northbound sealed shoulder	866

Table 2.35 Site 17 location details

Start GPS Coordinates	S 21° 1' 10.524"	E 118° 39' 2.991"
End GPS Coordinates	S 21° 1' 23.196"	E 118° 39' 11.159"
Site length	0.45 km	

2.7.18 Site 18: Great Northern Highway – SLK 1,558.85

Site 18 has a double two-way barrier centreline and conventional edge lines. This site was specifically chosen due to the presence of red pindan dust. However, the lines were noted to be very clear during day and night testing and were not affected greatly by the red pindan.

A collage of photographs of the site is shown in Figure 2.42, a site 3D scan is shown in Figure 2.43, the dimensions of the road are shown in Table 2.36, and specific location details are shown in Table 2.37.

Figure 2.42 Site 18 photographs – facing southbound

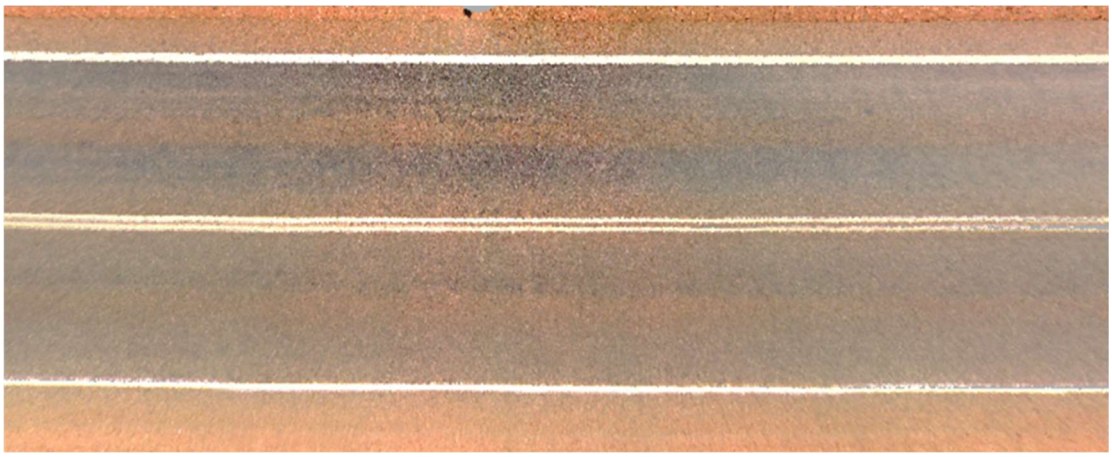

Figure 2.43 Site 18 3D point cloud

Table 2.36 Road dimensions measured at Site 18

Element	Width (mm)
Southbound sealed shoulder	1,034
Southbound edge line	151
Southbound lane	3,318
Double two-way barrier centreline (southbound side)	100
Gap between double centrelines	104
Double two-way barrier centreline (northbound side)	102
Northbound lane	3,405
Northbound edge line	158
Northbound sealed shoulder	749

Table 2.37 Site 18 location details

Start GPS Coordinates	S 20° 45' 4.896"	E 118° 31' 0.336"
End GPS Coordinates	S 20° 44' 49.092"	E 118° 30' 53.892"
Site length	0.55 km	

2.7.19 Site 19: Great Northern Highway – SLK 1,371.36 (Ad-hoc site)

Site 19 was discovered while travelling between Site 14 and Site 15. It was selected by the field-work team to be tested because of its severely faded edge lines. It seemed that the edge lines were faded due to heavy traffic as the site was located just after a curve where it was common for heavy vehicles to take the inside of the corner (hence the line being faded only on one side). The site had a broken separation centreline and conventional edge lines. This site also had evidence of the red pindan dust affecting the colour of the white lines.

A collage of photographs of the site is shown in Figure 2.44, a site 3D scan is shown in Figure 2.45, the dimensions of the road are shown in Table 2.38, and specific location details are shown in Table 2.39.

Figure 2.44 Site 19 photographs – facing southbound

Figure 2.45 Site 19 3D point cloud

Table 2.38 Road dimensions measured at Site 19

Element	Width (mm)
Southbound sealed shoulder	1,476
Southbound edge line	112
Southbound lane	3,685
Broken separation centreline	99
Northbound lane	3,407
Northbound edge line	140
Northbound sealed shoulder	1,311

Table 2.39 Site 19 location details

Start GPS Coordinates	S 22° 16' 7.464"	E 118° 45' 9.755"
End GPS Coordinates	S 22° 15' 7.416"	E 118° 45' 37.043"
Site length	2.00 km	

3 RESULTS

3.1 A typical warning

For the trial vehicle, a typical warning was triggered when the edge of the tyre first touched the edge of a lane marking. Reviews of the recorded video indicated that an audible warning occurred at the same time as a visual warning on the dashboard. The visual warning was a small flashing vehicle icon with two lanes on the dashboard that did not indicate which lane had been crossed. However, the heads-up display on the trial vehicle indicated which lane was being crossed.

The heads-up display on the trial vehicle also indicated whether the LDW system had recognised lanes on either side of the vehicle by illuminating a lane icon on either side of the centred vehicle icon. When a warning was triggered, the lane icon on the side of the vehicle that was being crossed would flash.

3.2 Classification of errors

An error was noted as a crossing event in which no lane departure warning was activated, or where a lane departure warning was activated despite no line being crossed. Five categories of error were identified in the post-processing analysis. Each of the categories are described below.

3.2.1 Unforced error

An unforced error was classified as an event where the trial vehicle's LDW system had ample time and distance to recover from a previous event and did not have any complex line layouts immediately ahead of it. This error was deemed to be a missed detection of a line-crossing where there were no other apparent contributing factors.

3.2.2 Line split error

This error occurred when an edge line split into a continuity line (broken line) and conventional edge line at the start of a turning slip lane. The vehicle crossed the broken line and no warning was activated. Figure 3.1 shows the occurrence where the symbol 'B' represents the trial vehicle.

This error only occurred at the start of the newly formed broken edge line. In other situations, where a line transitioned from a barrier to a broken line and a crossing event took place (over the transition), a normal warning activation was triggered.

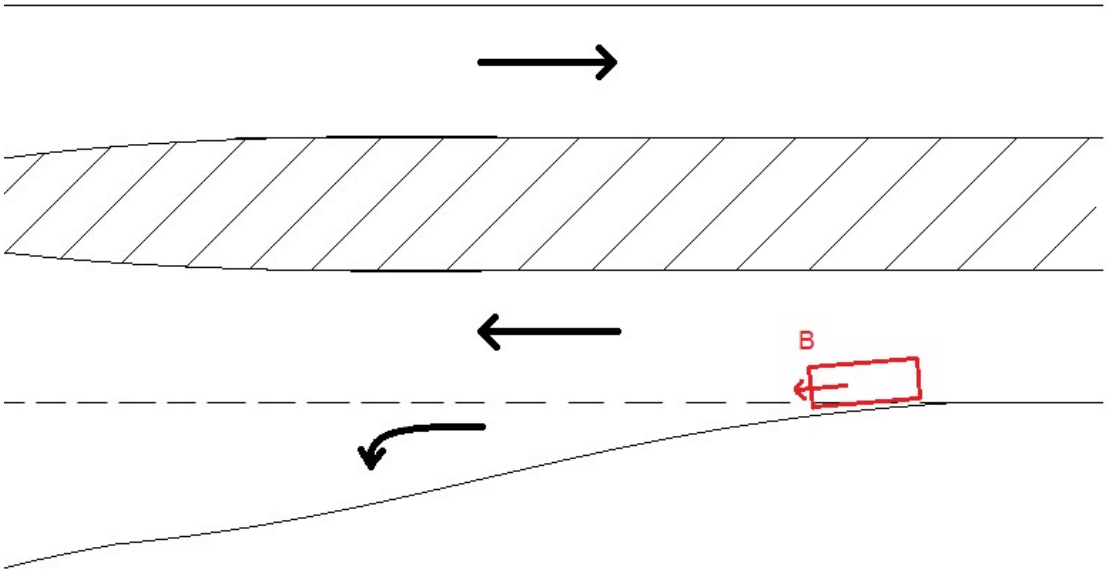

Figure 3.1 Top view diagram of line split error

3.2.3 Line formation error

This error occurred when the trial vehicle crossed a newly formed centreline or edge line that was not parallel to the lane of travel. The vehicle crossed the lines and no warning was activated. Two event crossings are demonstrated in Figure 3.2 with the symbol 'A' representing the trial vehicle.

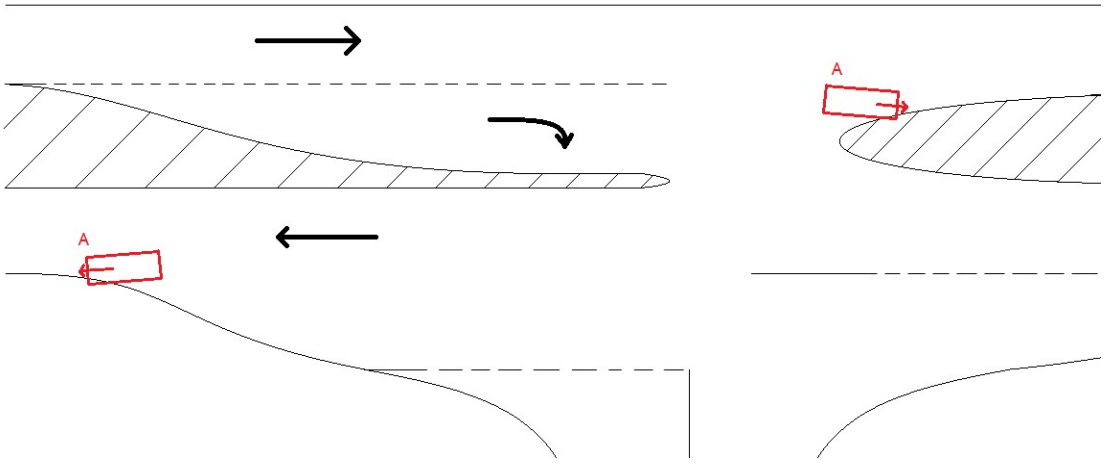

Figure 3.2 Top view diagram of line formation error

3.2.4 Forced error

The most common error occurred when the recovery distance of the trial vehicle following a previous crossing event was likely not large enough for the LDW system. After crossing a line, the driver of the trial vehicle intended to return to the centre of the travelling lane, but there were multiple times where this did not happen and the wheels either did not leave the marked line or only just left the marked line before another crossing event was initiated. In these cases, a warning was not activated.

Figure 3.3 demonstrates an example wheel path of the trial vehicle (shown in red) where the recovery distance was short. Crossing events 'A' and 'B' in the diagram are successful but crossing event 'C' is not successful due to the lack of recovery distance between events 'B' and 'C'.

Screenshots of some of the maximum recovery distances are shown in Figure 3.4. It is likely that the lack of recovery distance was a contributing factor to the absence of the LDW activation.

In the post-processing analysis, this was classified as a forced error.

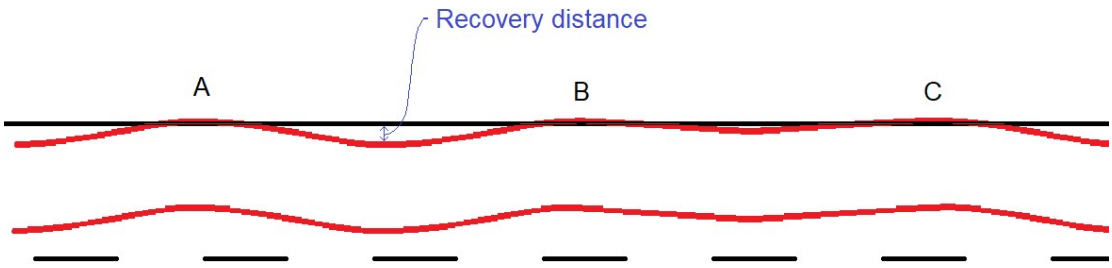

Figure 3.3 Wheel path of trial vehicle demonstrating recovery distance

Figure 3.4 Examples of recovery distance before LDW non-activation

3.2.5 False positive error

The field-work team encountered a repeated situation where a false positive error was activated. This error occurred multiple times over a pseudo line; a dark continuous marking that was situated on the road almost parallel to the travel direction of the trial vehicle. Screenshots of the road markings are shown in Figure 3.5 where the red arrows indicate the locations of the dark line that is suspected of causing the false positive warning activation.

This phenomenon is not included in the results as it was not associated with a line-crossing event but is reviewed in the Section 4.3.

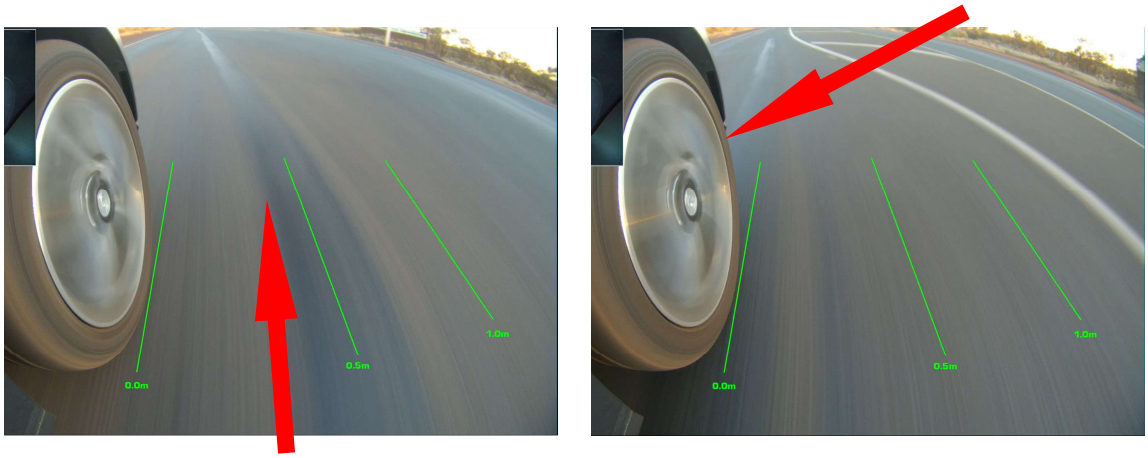

Figure 3.5 Examples of pseudo lines that triggered false positive errors

3.3 Number of categorised errors

The aggregation of different errors is shown in Table 3.1.

Table 3.1 Total numbers of categorised errors

Type of error	Total number	Percentage
Unforced error	4	0.3%
Line split error	2	0.2%
Line formation error	5	0.4%
Forced error	23	1.8%
No error	1250	97.4%
False positive error	4	-

3.4 Inclusion of errors in results

The aim of this study was to analyse the readiness of the WA lane markings along the Great Northern Highway using a LDW system. As many of the errors were activated due to human error, it is biased to include them in the results. Therefore, the forced error instances have been removed from the analysis below.

The line split error and the line formation error are considered in the discussion, but due to the complex nature of the LDW system, these instances have not been included as either a crossing event or as an error as they have been classified as a distinct repeatable error.

The instances of false positive errors were not triggered as the result of a line-crossing event and so have not been included in the analysis below. They are, however, discussed in Section 4.3.

3.5 Explanation of result tables

In most of the tables that follow the data is shown in the form: x/y (z%)

Where:

- x is the total number of positive warning activations
- y is the total number of crossing events
- z% is the percentage of positive activations (i.e. $z = x/y \times 100\%$)

3.6 Provision of all crossing event results

Appendix B contains the details of all crossing events, presented in two tables. One showing centrelines and the other showing edge lines.

3.7 Total crossing events and warning accuracy

Over the course of testing, there were 1,254 crossing events from which data were collected (not including the forced errors, line split errors and line formation errors). Overall, the warning accuracy of the trial vehicle was 99.7% (n=1,250/1,254).

3.8 All crossing events by line class and line side

The warning activations, total crossing events, and warning accuracy for centrelines and edge lines were disaggregated according to line type in Table 3.2. Highlighted in bold are the instances where errors occurred. As the data shows, there was no trend in the line types that consistently resulted in errors.

Table 3.2 Warning activations for lines tested

Line type	Centreline	Edge line	Total
Broken separation line	**188/189 (99.5%)**		**188/189 (99.5%)**
Double one-way barrier line (broken in direction of travel)	95/95 (100%)		95/95 (100%)
Double one-way barrier line (barrier in direction of travel)	**93/94 (98.9%)**		**93/94 (98.9%)**
Double two-way barrier line	265/265 (100%)		265/265 (100%)
Edge line		**459/461 (99.6%)**	**459/461 (99.6%)**
Audio-tactile longitudinal edge line		138/138 (100%)	138/138 (100%)
Conventional edge line with continuity line sections		12/12 (100%)	12/12 (100%)
Total	641/643 (99.7%)	609/611 (99.7%)	1250/1254 (99.7%)

3.9 All crossing events by site and time of day

The warning activations, total crossing events, and warning accuracy for the day/night conditions are disaggregated according to trial site in Table 3.3. Interestingly, the night testing was faultless, whereas the daytime testing comprised all the unforced errors.

Table 3.3 Warning activations at each site

Site	Day	Night	Total
1	**29/30 (96.8%)**	26/26 (100%)	**55/56 (98.2%)**
2	**33/34 (97.1%)**	41/41 (100%)	**74/75 (98.7%)**
3	47/47 (100%)	40/40 (100%)	87/87 (100%)
4	40/40 (100%)	35/35 (100%)	75/75 (100%)
5	44/44 (100%)	39/39 (100%)	83/83 (100%)
6	**41/42 (97.6%)**	37/37 (100%)	**78/79 (98.7%)**
7	**35/36 (97.2%)**	40/40 (100%)	**75/76 (98.7%)**
8	36/36 (100%)	47/47 (100%)	83/83 (100%)
9	35/35 (100%)	37/37 (100%)	72/72 (100%)
10	33/33 (100%)	33/33 (100%)	66/66 (100%)
11	36/36 (100%)	38/38 (100%)	74/74 (100%)
12	18/18 (100%)	-	18/18 (100%)
13	38/38 (100%)	-	38/38 (100%)
14	46/46 (100%)	41/41 (100%)	87/87 (100%)
15	41/41 (100%)	-	41/41 (100%)
16	49/49 (100%)	-	49/49 (100%)
17	37/37 (100%)	40/40 (100%)	77/77 (100%)
18	44/44 (100%)	33/33 (100%)	77/77 (100%)
19	41/41 (100%)	-	41/41 (100%)
Total	723/727 (99.5%)	527/527 (100%)	1250/1254 (99.7%)

3.10 Travel Speed

The aggregation of travel speed (GPS calculated) is shown in Table 3.5. Travel speed did not appear to influence the ability of the LDW system to correctly identify lane markings.

Table 3.4 Warning activations at each range of speed

Speed range (km/h)	Warning activations
55-59	3/3 (100%)
60-64	58/58 (100%)
65-69	**99/100 (99.0%)**
70-74	1/1 (100%)
80-84	30/30 (100%)
85-89	55/55 (100%)
90-94	102/102 (100%)
95-99	208/208 (100%)
100-104	**330/333 (99.1%)**
105-109	356/356 (100%)
110-114	8/8 (100%)
Total	1250/1254 (99.7%)

Three activations occurred below the trial vehicle's minimum travel speed requirement of 60 km/h. However, the speed values were taken from GPS data, not the vehicle's speedometer readings.

3.11 Daylight brightness

The measured daylight brightness ranged from a low of 4.6 kLux (1 kLux = 1000 Lux) to a high of 130 kLux. A value of 110 kLux is typically considered to be direct sunlight on a sunny day, while a value 20 kLux would be expected in a shaded area at noon on a sunny day. A dark overcast day would result in a brightness of around 2 kLux.

Table 3.5 shows the ranges of brightness and number of failures observed during each. There does not seem to be any correlation between the daylight brightness and the accuracy of the LDW system.

Table 3.5 Warning activations by brightness

Brightness (lux x1000)	Warning activations
0 (night)	527/527 (100%)
0.001 to 25	**117/118 (99.2%)**
25 to 50	**55/56 (98.2%)**
50 to 75	76/76 (100%)
75 to 100	**148/149 (99.3%)**
100 to 125	268/268 (100%)
125 to 150	**59/60 (98.3%)**
Total	1250/1254 (99.7%)

3.12 Sun glare

The warning activations associated with and without the presence of sun glare are shown in Table 3.6. Testing runs were not deliberately timed to coincide with sun glare, but the field-work team recorded 38 events where sun glare was present. Sun glare presence was classified subjectively by the field-work team in instances where they felt affected by glare. As shown in Table 3.6, sun glare did not seem to have a direct effect on the accuracy of the LDW system.

Table 3.6 Warning activation accuracy for sun glare scenarios

Sun glare	Total
No	**1212/1216 (99.7%)**
Yes	38/38 (100%)
Total	1250/1254 (99.7%)

3.13 Red pindan

The warning activations aggregated according to sites that were classified as having red pindan present are shown in Table 3.7. The red pindan did not seem to have an effect on warning errors.

Table 3.7 Warning activation accuracy for red pindan classified sites

Red pindan	Total
No	**417/419 (99.5%)**
Yes	**833/835 (99.8%)**
Total	1250/1254 (99.7%)

3.14 Faded lines

Table 3.8 shows the accuracy of warning activations based on sites classified with faded lines. Faded lines also did not seem to affect the LDW system.

Table 3.8 Warning activation accuracy for faded line classified sites

Faded lines	Total
No	**787/790 (99.6%)**
Yes	**463/464 (99.8%)**
Total	1250/1254 (99.7%)

3.15 Warning failures summary

Overall, 1,254 crossing events were measured in the data sample (excluding the line split errors, line formation errors, and forced errors). Of these, 1250 (99.7%) gave an accurate warning, with a total of 4 (0.3%) unexplained warning failures (unforced errors). There were no common characteristics related to the lane marking or road environment in these four warning failures, and as a result it was not possible to identify a consistent cause of this small number of failures.

4 DISCUSSION

The aim of this investigation was to undertake an on-road trial of the positional sensitivity of LDW systems when presented with typical lane markings found on remote WA roads.

4.1 Theory of LDW operation

While an investigation into the specific details of operation for LDW systems was beyond the scope of this study, it is still important to outline the general theory of operation in order to provide context to the discussion that follows.

Based on the authors understanding, and the experiences of the field-work team, the LDW system used in this study operated in the following way:

- In-vehicle sensors with a view out the front of the vehicle gather information about the road environment;
- This road data is processed and any lane markings in the field of view are identified. Lane markings must have some thickness (width) as opposed to just a transition in colourisation;
- The lateral position of the vehicle, relative to the lines, is then calculated by the system;
- A crossing event is predicted by the system when the lateral position of the vehicle intersects with a lane marking; and
- A warning is then signalled to the driver via an audio system, flashing dashboard indicator and flashing heads-up display icon.

It is important to note that the LDW system does not have a direct view of the vehicle's wheels or their position relative to any lane marking. The lateral position of the vehicle is thus calculated based on either extrapolation of the viewed line, or forward projection of the vehicle motion (e.g. expected future position based on current position of the steering wheel).

4.2 Unforced errors

The four unforced errors that took place in the study are analysed below. Each of the unforced errors were considered to have enough recovery time and distance before their occurrences. Each of the errors occurred at different sites and have been identified by the site number in the following sections.

4.2.1 Unforced error at Site 1

This error occurred at Site 1 when crossing over a double one-way barrier centreline (barrier in direction of travel) at the start of a run in a northbound direction. The travel speed was 103 km/h, the temperature was 35°C, and the brightness was 40 kLux (mid-late afternoon).

Reviewing the recorded video, the angle of crossing was not abnormal, but there were a few shadows that were partly covering the road from surrounding trees. Shadows over lane markings were listed in the limitations of the LDW system. The LDW system icon on the dashboard indicated that both lines had been identified and the LDW system was enabled. Figure 4.1 shows screenshots of the line crossing.

Three other events were conducted over this line segment in these conditions; one had a slightly late warning, and the other two had normal warning activations.

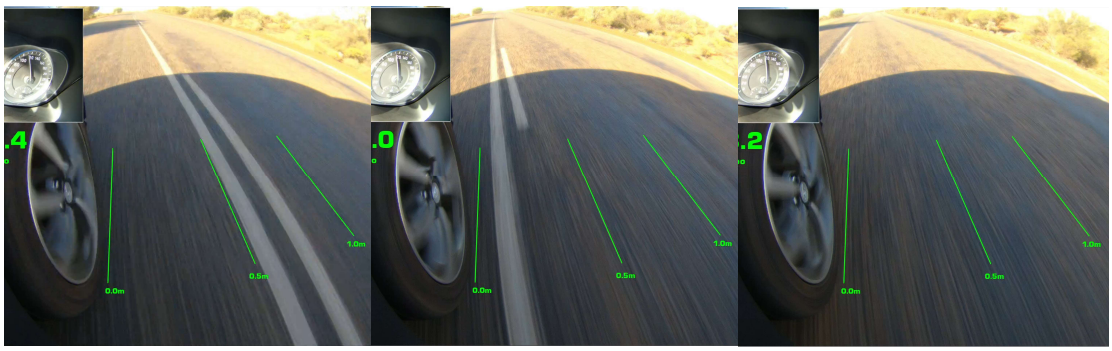

Figure 4.1 Screenshots of unforced error at Site 1

4.2.2 Unforced error at Site 2

This error occurred at Site 2 when crossing over a conventional edge line in the middle of a run in a northbound direction. The travel speed was 102 km/h, the temperature was 36°C, and the brightness was 93 kLux (mid-afternoon).

Reviewing the recorded video, the bitumen was a different shade of grey for the shoulder and part of the lane as can be seen in Figure 4.2. The different colourings may have concealed the lane markings. However, the LDW system did not seem affected for the majority of line-crossing events at this site. For all the successful line-crossing events at this site, the warning activations occurred once the wheel of the trial vehicle touched the white edge line, rather that when it crossed the change in bitumen colour. This is consistent with the findings of the previous study, such that the lines needed some thickness (width), rather than just an immediate change in surface colour, to be detected. There were also no shadows over the road at this location, and no other elements from the video recordings that attracted attention. Figure 4.2 shows screenshots of the crossing event. It should be noted that one other crossing event was tested at this exact location and no abnormalities were noted.

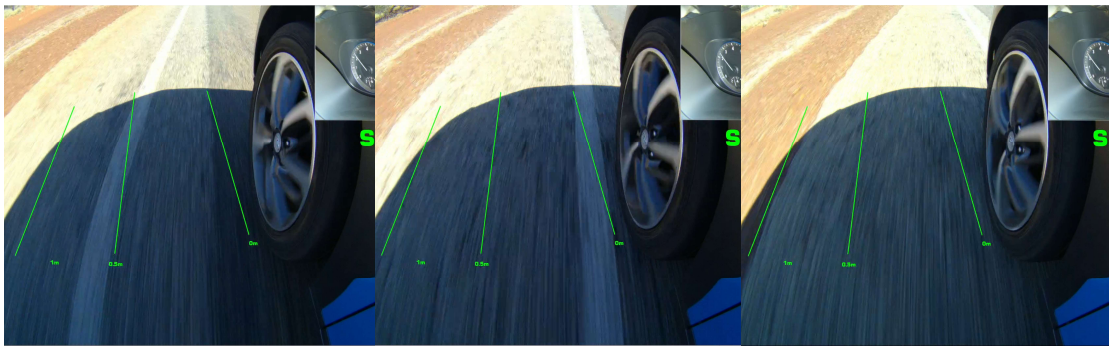

Figure 4.2 Screenshots of unforced error at Site 2

4.2.3 Unforced error at Site 6

This error occurred at Site 6 when crossing over a conventional edge line in the middle of a run in a southbound direction. The travel speed was 66 km/h, the temperature was 36°C, and the brightness was 0.7 kLux (late in the afternoon).

Reviewing the recorded video, it was noted again that just as the crossing event occurred, the LDW system icon changed colour indicating that either the edge line or centreline was not being tracked. The angle of crossing was normal and there was sufficient time and distance given for the system to reset after the previous line-crossing event. There were no shadows over this section of the road. Figure 4.3 shows screenshots of the crossing event. It is noteworthy that two other events were conducted at this exact location, and in both runs, the LDW system triggered warnings for the pseudo lines and the real lines.

Figure 4.3 Screenshots of unforced error at Site 6

4.2.4 Unforced error at Site 7

This error occurred at Site 7 when crossing over a broken separation centreline at the start of a run in a southbound direction. The travel speed was 101 km/h, the temperature was 33°C, and the brightness was 127 kLux (late-morning).

Reviewing the recorded video, the LDW was fully enabled before, during and after the crossing event. This was evident by the colour of the icon on the dashboard. The angle of crossing was normal, there were no shadows in the vicinity of the road section and no other elements from the video recordings that attracted attention. Figure 4.4 shows screenshots of the crossing event. Again, two other runs were conducted at this location and neither displayed any issues with detecting the line crossings.

Figure 4.4 Screenshots of unforced error at Site 7

4.3 False positives

One area of concern that has arisen from this project is the existence of pseudo lines, which for this study were dark markings on the road such as black paint covering pre-existing lane markings, and the effect they have on LDW systems. At Site 6 there were pseudo lines that were detected by the LDW system, and almost every run over the dark lines triggered a LDW activation. The characteristics of the pseudo lines that caused the false positive warnings are unknown, and as the scope of the project did not include investigation of this phenomenon further research is required. Lane support systems, such as lane keeping assist (LKA), or autonomous vehicles which manipulate the steering could become confused by such pseudo lines and may steer a vehicle out of the nominal lane position or even off the road completely.

4.4 Analysis of night conditions and road surface characteristics

One of the aims of the study was to investigate the effect of night-conditions on the suitability of lane markings for LDW systems. As the accuracy of warning activations at night-time were 100%, it is likely the lighting conditions do not affect the reliability of the LDW system. The red pindan dust that was of concern also had no repeated effect on the reliability of the LDW system. It was noted by the field-work team that almost all the lines appeared to have been repainted in the last few years, and so the long-term effect of the red pindan dust was not tested.

4.5 Study limitations

By design, the scope of the study was limited to be an observational study conducted over eight days. The majority of sites were pre-planned (95%) along a specific highway with no other roads being tested. This project was not an audit of all WA roads and cannot indicate the quality of the lane markings on the roads that were not tested. In particular, the trial was undertaken on a highway on which the lane markings were of a very high quality. If the trial been undertaken on roads with poorer markings, it is possible that the results may not have been quite so successful, and a larger number of warning failures may have been noted. However, the sites that were selected did provide a diverse variety of lane markings and allowed for an investigation of the quality of lane markings during night conditions and with the presence of red pindan.

The weather over the nine days was continuously high (an average maximum temperature of 40°C) with no rain. Therefore, all the tests were completed on dry surfaces and no wet surfaces were tested. The on-road trial was also conducted exclusively on single lane, undivided roads. No data was collected on dual lane roads, overtaking lanes, or on roads with roadside infrastructure, such as crash barriers. Only one camera-based LDW system was used to test the suitability of the lane markings. Other vehicles with different LDW systems may provide different results.

4.6 Comparison of results to previous study

From the previous study, the accuracy of warning activations for line-crossings over marked edge lines and centrelines was 93.2% (138 of 148). The accuracy of the current study (99.7%) showed an improvement, despite being undertaken in seemingly more difficult conditions (night-time, red pindan). The accuracy variances could be due to differences in the vehicles, LDW systems used, the roads tested, or the larger sample of events and sites used in the current study.

4.7 Conclusions

The findings of this study show that the lane markings tested on the remote WA roads provided a sufficient basis for the LDW system to provide appropriate warnings during line-crossing events, both in daylight and night time hours, as well as in the presence of red pindan. These results indicate that remote roads in WA may be suitable for vehicles with LDW technology. However, further trials would be required with a variety of vehicles, different LDW systems and a more comprehensive sample of roads in order for this to be conclusively demonstrated.

5 RECOMMENDATIONS

5.1 Maintain an adequate maintenance regime for remote lane markings

This report has highlighted that, in general, vehicles equipped with LDW or LKA systems should operate reliably with the lane markings applied on the Great Northern Highway. It is recommended that the remainder of the lane markings throughout remote WA are also kept to similar standards, especially with the increasing number of vehicles equipped with lane support systems.

5.2 Review road maintenance that may result in the creation of pseudo lines

It was observed, at Site 6, that repair/maintenance works which create pseudo lines along the road can deceive a LDW system into responding to those markings. A similar effect was also observed in a previous study of LDW system response to line markings in rural WA (Mackenzie et al., 2018). Identifying the specific features of markings that result in a pseudo line that is capable of triggering a false positive warning were not part of the investigation in this study or the previous study. As such, more research is required to conclusively determine what events, such as road maintenance or road wear, will produce pseudo lines. Until then, road maintenance that produces longitudinal markings along the roadway should be reviewed (and possibly rectified) as it can result in the creation of pseudo lines where LDW systems may not operate reliably. Furthermore, technologies that manipulate the steering wheel in response to lane markings may erroneously manoeuvre a vehicle out of the correct lane in response to pseudo lines.

5.3 Provide sufficient space for recovery

The warnings provided by the LDW system assessed in this study were triggered as the vehicle travelled across a lane marking. When a driver, who may be distracted or fatigued, receives a warning they will require some period of time to respond and take corrective action. During this response time, their vehicle will continue to travel past the lane marking and towards the edge of the road. The provision of appropriately wide sealed roadside shoulders (or wider gap between barrier centre lines where appropriate) will enable drivers to successfully recover their vehicle in response to a lane departure warning.

5.4 Future research

While the current study has resulted in a number of findings, there were also several limitations (as discussed in Section 4.5). To overcome some of these limitations, a program of future research is recommended. Seven potential projects are suggested below.

5.4.1 Audit of lane marking suitability

The trial vehicle used in this study, had a heads-up display screen that indicated to the driver whether the LKA system was active, or otherwise. As part of this display, the system also indicated which of the lane markings (left or right) were being actively detected. It may be possible to use this dashboard display, combined with GPS position data, to complete a highway audit. A drive through of important sections of the WA road network, using a car with this equipment installed, would permit sections of the road where the lines are not visible to the LKA system to be identified.

5.4.2 Different weather conditions study

Testing during different weather conditions is important. This study tested the LDW system in medium to hot, dry weather, at day, dusk and night. Rain and flooding conditions were not tested. An interesting extension on this project would be to investigate the effect of rain on the LDW system.

5.4.3 Quantification of lane marking requirements

A camera-based LDW system was used in this study. The characteristics of lane markings that made the lines conspicuous to the LDW system are generally unknown. It would be worthwhile to test and quantify minimum thresholds for conspicuity that should be observed for LDW system accuracy. A systematic study could be undertaken to artificially generate several different line and bitumen combinations with various contrasts, dimensions, materials and colours to identify the most relevant metric for line conspicuity.

5.4.4 Examination of system reliability where there is other infrastructure

Only lines marked on the road, in a generally consistent pattern, were considered in the current study. The analysis did not include other types of highway infrastructure. This includes locations where there are other markings on the road (e.g. information

painted on the road in the middle of motor ways) or where there are crash barriers that run parallel to the road. Sections of road with infrastructure like this could be examined in a study with a similar methodology to the current one.

5.4.5 Investigation of the effect of departure angle

One consideration for this study was the investigation of the effect that departure angle has on the reliability of LDW. However, during the risk assessment process, the application of anything greater than a small departure angle while travelling at high speed was deemed unsafe. An alternative to an on-road trial would be to conduct this type of investigation on a test track, where higher departure angles could be applied in a safe manner.

5.4.6 Testing multiple vehicle manufacturers

As different manufacturers of vehicles use different lane support system technology, it would be relevant to trial multiple vehicles and their compatibility with different lane markings. This would enable an insight into the average response of the upcoming fleet of vehicles. Ideally, this aspect of future research would include LDW testing of commercial vehicles and heavy vehicles, given their large representation on WA's freeways.

5.4.7 Investigation on pseudo lines

Due to the raised concern of pseudo lines and their influence on LDW systems, further research is recommended to identify the specific characteristics, and explore the effects of pseudo lines. As the pseudo lines were a product of line-marking alterations, current alternative methods of line-marking alterations should be investigated also as they may also have an influence on the LDW systems.

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APPENDIX A

Risk assessments are shown below for the three project activities identified as dangerous:

- A1: Driving to, from, and between trial sites;
- A2: Performing the evaluation at each trial site; and
- A3: Conducting the LDW trials at each test location.

These risk assessments were initially generated by researchers at CASR then subsequently reviewed by project stakeholders at C-MARC and MRWA. Based on the risk assessments, a safe operating procedure was then developed for the field-work team to follow when conducting each activity.

HAZARD MANAGEMENT – RISK ASSESSMENT(LONG FORM)

Stage 1:	Hazard Identification	Residual risk rating L, M, H, VH	M
Name or description of the activity(s) to be assessed	WA Lane marking and lane support systems (2018): Driving to/from trial sites	**Date**:	12/11/2018
Area, School/Branch Building/Room	CASR/ECMS		
Workers completing the risk assessment. Name and contact details	**MARIO MONGIARDINI**	**Mobile/Phone**	**0424 342 931**
	MARTIN ELSEGOOD	**Mobile/Phone**	**0416 802 436**
	JAMIE MACKENZIE	**Mobile/Phone**	**08 8313 7329**

- This template or equivalent template can be used. Please note that this list is not exhaustive, but can be used as the basis for your initial hazard identification.
- If you tick yes to any of the hazards listed below, then the hazard is to be transferred and addressed on **Appendix C2.**
  Where a number of activities have the same hazards, they may be grouped together on the same assessment and the same control measures applied to each.

Consider – is there potential for, or identified exposure to any of the following, as part of a process/activity

	Physical/Environmental Hazards		**Plant and Equipment hazards**
☐	Animals (e.g. hazardous wild animals, bees, snakes)	☐	Mobile lifting equipment or farm machinery
☐	Confined space entry (e.g. pit, tank, silo, entry through a hatch)	☐	Pressurised vessels/systems (e.g. autoclave, boiler)
☐	Fall from a height (e.g. ladder, elevated platform, cliff, scaffolding)	☐	Hazardous levels of heat or vibration (to whole or part body)
☐	Fire (potential for uncontrolled fire due to ignition sources)	☐	Hazardous plant (e.g. lathes, lasers, microtomes, cryostats,
☒	Flying or moving items/plant/vehicles, falling object(s)		or operations could result in amputation, eye injury, serious
☐	Hazardous terrain or environment including wet/slippery surfaces		laceration, crushing injury)
☒	Lighting/visibility is compromised and hazardous		**Radiation hazards**
☐	Noise or sound levels > 85dB(A) or peak level of greater than	☐	Sealed sources or unsealed sources
	135 dB(C) for any period of time	☐	Artificial sources (UV)
☒	Temperature or weather extremes (e.g. hypothermia, major burns)		**Biological hazards (e.g. via inhalation, contact, digestion)**
☒	Isolation (e.g. work in a remote area, difficult to access work site,	☐	Contamination (e.g. pathogens, body fluids)
	or a rescue effort would be difficult in the event of an emergency.	☐	Animal handling (e.g. bites, allergies)
☐	Boating and/or Diving (e.g. risk of drowning)	☐	Other
	Communications		**Chemical hazards**
☒	Communication problems (e.g. by virtue of location or isolation)	☐	Explosive substances
	Electrical	☐	Flammable substances, gas, airborne contaminants
☐	Electric shock	☐	Toxic or asphyxiate gas (e.g. CO_2 including dry ice, liquid N_2)
	Ergonomic/Hazardous Manual activity/task(s)	☐	Respiratory irritants (e.g. nanotech, dust, asbestos)
☐	Work requiring repetitive force or movement	☐	Chemical spraying (e.g. agricultural, pesticides)
☐	Sustained force/posture or awkward posture	☐	Prohibited and restricted carcinogens requiring a permit
☐	Working with animals, unpredictable/unbalanced loads	☐	Hazardous chemicals (not included above)
☐	Transfer of item(s) up or down stairs, using both hands or	☐	Other
	requiring the use of lifting equipment from one level to another		**Activity combines a number of different hazards, and**
	Stress/Duress hazards		**the impact/results of interaction is unknown e.g. mixing**
☐	Personal threat e.g. aggressive behaviour, abuse, threat, assault		**chemicals or recognised as a risk e.g. water and electricity.**
	(includes home visits)	☐	Specify -
☐	Fatigue e.g. from excessive work related mental/physical exertion		**High Risk Travel**
	Remote work location or working in isolation	☐	Destination is rated DFAT 3 or 4 (High/Very High)
☒	Medical emergency, difficult to administer/obtain first aid		**High risk work licence required in accordance with WHS Regs**
	gain assistance e.g. access to medical facilities	☐	Boom-type elevating work platform, scaffolding, dogging,
	Other		crane and hoist operation, reach stackers, forklift operation,
☐			pressure equipment operation.
☐			
☐		☐	**No hazards identified. No risk assessment required.**

HAZARD MANAGEMENT

Stage 2 and Stage 3 – Risk Assessment and Control

Record the potential hazards/issues identified in Hazard Identification Process on Appendix C1 **and** **When and where the hazard is present (i.e. when is the worker exposed?)**	**Inherent risk assessment rating** Before controls are implemented (Refer to the risk assessment Tables – Appendix C3) **L, M, H, VH**	**List the control measures implemented (i.e. in place)** • Control measures are to be in accordance with the Hierarchy of Control. Refer to Appendix C3 for examples. • Choose the control(s) that most effectively eliminate the hazard or minimises the risk. • Record the control measures in place under the relevant control measure (e.g. list in order under the following headings - substitution, isolation, engineering, administrative, Personal Protective Equipment). • Ensure that control measures do not introduce new hazards.	**Residual risk rating** After controls in place The highest rating is to be transferred to the top of page C1.
Traffic accident due to driving fatigue	**VH**	Admin – Two CASR staff will share the driving task. Admin – The driving task will be performed for no more than 2 hours (absolute limit) before resting for 15 minutes. Admin – Rest breaks to be taken when either person feels fatigued. Admin – An excess amount of travel time has been allocated in the itinerary of activities such that there should be no time pressures when travelling.	**Medium**
Driver distracted by equipment mount failing inside vehicle	**H**	Eng. – Cameras will be mounted with high pressure suction cup. Eng. – Camera cables will be routed and secured with adhesive tape. Admin – Cameras will be positioned such that they will not swing or drop into the driver should the suction cup fail.	**Low**
Equipment blocking driver's view of the road	**H**	Admin – Cameras will be located where they do not restrict the driver's field of vision.	**Low**
Equipment blocking driver's view of the instrument panel	**H**	Admin – Cameras will be located where they do not restrict the driver's view of the instrument panel, including the speed indication.	**Low**
Accident when driving at night due to limited visibility	**M**	Admin – Using appropriate headlights based on the condition of the road. Admin – Adjust speed based on limited visibility at night and potential wildlife crossing road.	**Medium**
Breakdown of vehicle in remote location	**L**	Admin – Vehicle to be in good, reliable working condition. Admin – Satellite phone available for requesting road assistance. Admin – Food and water supplies available in vehicle. Admin – Torches and high-visibility vests available in vehicle. Eng. – Activate light beacon if necessary (at night). Eng. – Spare tyre available.	**Low**

Staff related activities (Note – Low and Medium Residual Risk does not require Manager/Supervisor authorisation)			**Student related activities**		
Author	**Name and Signature**		**Author**	**Name and Signature**	
High Residual Risk – Authorised by Manager/Supervisor	**Name and Signature/authority**		**Low and Medium Residual Risk – Authorised by Manager/Supervisor**	**Name and Signature/authority**	
High Residual Risk – Authorised by Head of School/Branch	**Name and Signature/authority**		**High Residual Risk – Authorised by Head of School/Branch**	**Name and Signature/authority**	
Very High Residual Risk – Authorised by VC&P	**Name and Signature/authority**		**Very High Residual Risk – Authorised by VC&P**	**Name and Signature/authority**	

HAZARD MANAGEMENT

RISK ASSESSMENT TABLES

Three essential steps are taken:
1. The probability or likelihood of an incident occurring is evaluated;
2. The severity of the potential consequences is calculated or estimated;
3. Based on these two factors, the risks are assigned priority for risk control through the use of a risk rating.

Risk assessment involves examining and evaluating the likelihood/severity/consequence in order to prioritise and implement adequate controls. The risk matrix has been adopted based on the principles of AS/NZS ISO 31000 (2009) Risk Management – Principles and Guidelines and Code of Practice "How to Manage Work Health and Safety Risks (2012).

Likelihood Table

CATEGORY	DESCRIPTION
Almost certain	There is an expectation that an event/incident will occur.
Likely	There is an expectation that an event/incident **could occur** but not certain to occur.
Slight	This expectation lies somewhere in the midpoint between "could" and "improbable".
Unlikely	There is an expectation that an event/incident is doubtful or **improbable** to occur.
Rare	There is no expectation that the event/incident will occur.

Consequences Table

CATEGORY	DESCRIPTION
Severe	Injury resulting in death, permanent incapacity.
Major	Injury requiring extensive medical treatment, hospitalisation, or activities could result in a Notifiable occurrence.
Moderate	Injury requires formal medical treatment (hospital outpatient/doctors visit etc), activities could result in an Improvement Notice.
Minor	Injury requires first aid.
Negligible	Injury requires minor first aid (e.g. bandaid), or result in short term discomfort (e.g. bruise, headache, muscular aches etc), no medical treatment.

Risk matrix

Likelihood	Consequences				
	Negligible	Minor	Moderate	Major	Severe
Almost Certain	Medium	High	Very High	Very High	Very High
Likely	Medium	Medium	High	Very High	Very High
Slight	Low	Medium	High	High	Very High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

If the level of risk is assessed as high or very high
- ❑ Stop the activity; or
- ❑ Tag out the plant/equipment; or
- ❑ Secure any chemical; and
- ❑ Determine if the activity is to:
  - ❑ continue; or
  - ❑ cease

in consultation with your Manager/Supervisor.

Follow the process in 3.5.6.1 where the risk cannot be reduced to medium or low.

HAZARD MANAGEMENT

HIERARCHY OF RISK CONTROL

Hierarchy of control			Examples of control measures	
HIGHEST	Level 1	Elimination	• Not introducing the hazard into the workplace. • Designing out the hazards before they are introduced. • Removing the hazard completely. • Not conducting the activity.	MOST
	If this is not practicable then ↓			
	Level 2 Where it is not reasonably practicable to eliminate the hazards and associated risks.	Substitution	• Replacing or substituting the hazard with something safer.	
		Isolation	• Isolating the hazard from the people by distance or using barriers.	
		Engineering	• Installing/using a control measure of a physical nature, including a mechanical device or process e.g. trolleys, hoists, guards, residual current devices, fume-hoods, extraction/ventilation systems, RCD protection.	
	↓			
LEVEL OF HEALTH AND SAFETY PROTECTION	Level 3 These control measures do not control the hazard at the source. They rely on human behaviour and supervision, and used on their own tend to be the least effective in minimising risks.	Administrative	• Documenting a standard operating procedure (SOP) and include in the induction program for all staff required to perform the activity • Developing a proficiency based training program if required by the risk assessment (see definitions) (Workers may be trained against the SOP Appendix E or other assessment criteria.) • Training workers to use control measures implemented when carrying out the activity • Introducing a second operator • Providing signage or warning labels • Restricting access • Maintenance and testing programs • Changing the work organisation e.g. relocating equipment or items, rotating workers between different activities	RELIABILITY OF CONTROL MEASURES
LOWEST	Exposure is only limited if the worker wears and uses the PPE correctly.	Personal Protective Equipment (PPE)	Requiring the use of one or more of the following: • ear protection (ear muffs) • respirators • face masks • hard hats/helmet • gloves, aprons • eye protection (glasses, shield, visor) • non-slip footwear • appropriate clothing	LEAST

For further examples and explanation on the Hazard Management and Risk Control process, please refer to the Code of Practice for How to manage WHS Risks (2011).

HAZARD MANAGEMENT – RISK ASSESSMENT(LONG FORM)

Stage 1:	Hazard Identification	Residual risk rating L, M, H, VH	M
Name or description of the activity(s) to be assessed	WA lane marking and lane support systems (2018): Site surveying	**Date**:	12/11/2018
Area, School/Branch Building/Room	CASR/ECMS		
Workers completing the risk assessment. Name and contact details	**MARIO MONGIARDINI**	**Mobile/Phone**	**0424 342 931**
	MARTIN ELSEGOOD	**Mobile/Phone**	**0416 802 436**
	JAMIE MACKENZIE	**Mobile/Phone**	**08 8313 7329**

- This template or equivalent template can be used. Please note that this list is not exhaustive, but can be used as the basis for your initial hazard identification.
- If you tick yes to any of the hazards listed below, then the hazard is to be transferred and addressed on **Appendix C2.** Where a number of activities have the same hazards, they may be grouped together on the same assessment and the same control measures applied to each.

Consider – is there potential for, or identified exposure to any of the following, as part of a process/activity

	Physical/Environmental Hazards		**Plant and Equipment hazards**
☒	Animals (e.g. hazardous wild animals, bees, snakes)	☐	Mobile lifting equipment or farm machinery
☐	Confined space entry (e.g. pit, tank, silo, entry through a hatch)	☐	Pressurised vessels/systems (e.g. autoclave, boiler)
☐	Fall from a height (e.g. ladder, elevated platform, cliff, scaffolding)	☐	Hazardous levels of heat or vibration (to whole or part body)
☐	Fire (potential for uncontrolled fire due to ignition sources)	☐	Hazardous plant (e.g. lathes, lasers, microtomes, cryostats,
☒	Flying or moving items/plant/vehicles, falling object(s)		or operations could result in amputation, eye injury, serious
☒	Hazardous terrain or environment including wet/slippery surfaces		laceration, crushing injury)
☐	Lighting/visibility is compromised and hazardous		**Radiation hazards**
☐	Noise or sound levels > 85dB(A) or peak level of greater than	☐	Sealed sources or unsealed sources
	135 dB(C) for any period of time	☐	Artificial sources (UV)
☒	Temperature or weather extremes (e.g. hypothermia, major burns)		**Biological hazards (e.g. via inhalation, contact, digestion)**
☒	Isolation (e.g. work in a remote area, difficult to access work site,	☐	Contamination (e.g. pathogens, body fluids)
	or a rescue effort would be difficult in the event of an emergency.	☐	Animal handling (e.g. bites, allergies)
☐	Boating and/or Diving (e.g. risk of drowning)	☐	Other
	Communications		**Chemical hazards**
☒	Communication problems (e.g. by virtue of location or isolation)	☐	Explosive substances
	Electrical	☐	Flammable substances, gas, airborne contaminants
☐	Electric shock	☐	Toxic or asphyxiate gas (e.g. CO_2 including dry ice, liquid N_2)
	Ergonomic/Hazardous Manual activity/task(s)	☐	Respiratory irritants (e.g. nanotech, dust, asbestos)
☐	Work requiring repetitive force or movement	☐	Chemical spraying (e.g. agricultural, pesticides)
☐	Sustained force/posture or awkward posture	☐	Prohibited and restricted carcinogens requiring a permit
☐	Working with animals, unpredictable/unbalanced loads	☐	Hazardous chemicals (not included above)
☐	Transfer of item(s) up or down stairs, using both hands or	☐	Other
	requiring the use of lifting equipment from one level to another		**Activity combines a number of different hazards, and**
	Stress/Duress hazards		**the impact/results of interaction is unknown e.g. mixing**
☐	Personal threat e.g. aggressive behaviour, abuse, threat, assault		**chemicals or recognised as a risk e.g. water and electricity.**
	(includes home visits)	☐	Specify -
☐	Fatigue e.g. from excessive work related mental/physical exertion		**High Risk Travel**
	Remote work location or working in isolation	☐	Destination is rated DFAT 3 or 4 (High/Very High)
☒	Medical emergency, difficult to administer/obtain first aid		**High risk work licence required in accordance with WHS Regs**
	gain assistance e.g. access to medical facilities	☐	Boom-type elevating work platform, scaffolding, dogging,
	Other		crane and hoist operation, reach stackers, forklift operation,
☐			pressure equipment operation.
☐		☐	**No hazards identified. No risk assessment required.**

HAZARD MANAGEMENT

Stage 2 and Stage 3 – Risk Assessment and Control

Record the potential hazards/issues identified in Hazard Identification Process on Appendix C1 **and** **When and where the hazard is present (i.e. when is the worker exposed?)**	**Inherent risk assessment rating** Before controls are implemented (Refer to the risk assessment Tables – Appendix C3) **L, M, H, VH**	**List the control measures implemented (i.e. in place)** • Control measures are to be in accordance with the Hierarchy of Control. Refer to Appendix C3 for examples. • Choose the control(s) that most effectively eliminate the hazard or minimises the risk. • Record the control measures in place under the relevant control measure (e.g. list in order under the following headings - substitution, isolation, engineering, administrative, Personal Protective Equipment). • Ensure that control measures do not introduce new hazards.	**Residual risk rating** After controls in place The highest rating is to be transferred to the top of page C1.
Bushfire	**VH**	Admin – SMS text alerts from the WA Department of Fire and Emergency Services will be sent based on last known location of mobile phone. All CASR staff will carry mobile phones with location services switched on. If an alert for a nearby bushfire is received, CASR staff will depart and travel to a safe location. Admin – A satellite phone will be available for use in remote areas. It will be used for periodic updates if a prior warning has been received.	**Medium**
Stings or bites due to contact with insects and animals	**M**	PPE – CASR staff will wear closed shoes, long pants, long-sleeved shirts and a broad-brimmed hat. PPE – Insect repellent will be provided to CASR staff. Admin – CASR staff will avoid areas where there is long grass.	**Low**
Sunburn	**VH**	PPE – Sunscreen will be applied at regular intervals based on manufacturer recommendations. PPE – CASR staff will wear closed shoes, long pants, long-sleeved shirts and a broad-brimmed hat. Admin – CASR staff will avoid spending large amounts of time exposed to sunlight.	**Low**
Dehydration due to extreme temperature	**M**	Admin – Sufficient drinking water will be provided to CASR staff. Admin – CASR staff will remind one another to drink water throughout the day.	**Low**
Fatigue due to extreme temperature	**M**	Admin – Staff to check one another at regular intervals for signs of heat-exhaustion. PPE – CASR staff will wear long loose pants and a loose shirt with long sleeves. Admin – Regular breaks will be taken between working. Admin – A vehicle with air-conditioning will be available to provide relief from the heat.	**Low**
Hit by vehicle when performing site survey	**VH**	Admin – Roads being surveyed are low volume and there is good sight distance. Admin – CASR staff will wear high-visibility safety vests. Admin – While one CASR staff undertakes site survey, the other CASR staff will be designated as a look out to warn of any potential hazard.	**Medium**
Causing a crash by distracting other drivers	**VH**	Admin – CASR staff will wear safety vests.	**Medium**
CASR vehicle creates a roadside hazard	**VH**	Isolation – The CASR vehicle will be parked in a safe location that is as away from the edge of the road as possible.	**Low**
Medical event	**M**	Admin – Satellite phone will be available for requesting health assistance. Admin – First aid kit will be available in vehicle. Admin – At least one CASR staff with first aid training will be present.	**Medium**

Staff related activities (Note – Low and Medium Residual Risk does not require Manager/Supervisor authorisation)			**Student related activities**		
Author	**Name and Signature**		**Author**	**Name and Signature**	
High Residual Risk – Authorised by Manager/Supervisor	**Name and Signature/authority**		**Low and Medium Residual Risk – Authorised by Manager/Supervisor**	**Name and Signature/authority**	
High Residual Risk – Authorised by Head of School/Branch	**Name and Signature/authority**		**High Residual Risk – Authorised by Head of School/Branch**	**Name and Signature/authority**	
Very High Residual Risk – Authorised by VC&P	**Name and Signature/authority**		**Very High Residual Risk – Authorised by VC&P**	**Name and Signature/authority**	

HAZARD MANAGEMENT

RISK ASSESSMENT TABLES

Three essential steps are taken:

4. The probability or likelihood of an incident occurring is evaluated;
5. The severity of the potential consequences is calculated or estimated;
6. Based on these two factors, the risks are assigned priority for risk control through the use of a risk rating.

Risk assessment involves examining and evaluating the likelihood/severity/consequence in order to prioritise and implement adequate controls. The risk matrix has been adopted based on the principles of AS/NZS ISO 31000 (2009) Risk Management – Principles and Guidelines and Code of Practice "How to Manage Work Health and Safety Risks (2012).

Likelihood Table

CATEGORY	DESCRIPTION
Almost certain	There is an expectation that an event/incident will occur.
Likely	There is an expectation that an event/incident **could occur** but not certain to occur.
Slight	This expectation lies somewhere in the midpoint between "could" and "improbable".
Unlikely	There is an expectation that an event/incident is doubtful or **improbable** to occur.
Rare	There is no expectation that the event/incident will occur.

Consequences Table

CATEGORY	DESCRIPTION
Severe	Injury resulting in death, permanent incapacity.
Major	Injury requiring extensive medical treatment, hospitalisation, or activities could result in a Notifiable occurrence.
Moderate	Injury requires formal medical treatment (hospital outpatient/doctors visit etc), activities could result in an Improvement Notice.
Minor	Injury requires first aid.
Negligible	Injury requires minor first aid (e.g. bandaid), or result in short term discomfort (e.g. bruise, headache, muscular aches etc), no medical treatment.

Risk matrix

Likelihood	Consequences				
	Negligible	Minor	Moderate	Major	Severe
Almost Certain	Medium	High	Very High	Very High	Very High
Likely	Medium	Medium	High	Very High	Very High
Slight	Low	Medium	High	High	Very High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

If the level of risk is assessed as high or very high

- ❑ Stop the activity; or
- ❑ Tag out the plant/equipment; or
- ❑ Secure any chemical; and
- ❑ Determine if the activity is to:
  - ❑ continue; or
  - ❑ cease

in consultation with your Manager/Supervisor.

Follow the process in 3.5.6.1 where the risk cannot be reduced to medium or low.

HAZARD MANAGEMENT

HIERARCHY OF RISK CONTROL

Hierarchy of control			Examples of control measures	
HIGHEST	Level 1	Elimination	• Not introducing the hazard into the workplace. • Designing out the hazards before they are introduced. • Removing the hazard completely. • Not conducting the activity.	MOST
	If this is not practicable then ↓			
LEVEL OF HEALTH AND SAFETY PROTECTION	Level 2 Where it is not reasonably practicable to eliminate the hazards and associated risks.	Substitution	• Replacing or substituting the hazard with something safer.	RELIABILITY OF CONTROL MEASURES
		Isolation	• Isolating the hazard from the people by distance or using barriers.	
		Engineering	• Installing/using a control measure of a physical nature, including a mechanical device or process e.g. trolleys, hoists, guards, residual current devices, fume-hoods, extraction/ventilation systems, RCD protection.	
	↓			
	Level 3 These control measures do not control the hazard at the source. They rely on human behaviour and supervision, and used on their own tend to be the least effective in minimising risks.	Administrative	• Documenting a standard operating procedure (SOP) and include in the induction program for all staff required to perform the activity • Developing a proficiency based training program if required by the risk assessment (see definitions) (Workers may be trained against the SOP Appendix E or other assessment criteria.) • Training workers to use control measures implemented when carrying out the activity • Introducing a second operator • Providing signage or warning labels • Restricting access • Maintenance and testing programs • Changing the work organisation e.g. relocating equipment or items, rotating workers between different activities	
LOWEST	Exposure is only limited if the worker wears and uses the PPE correctly.	Personal Protective Equipment (PPE)	Requiring the use of one or more of the following: • ear protection (ear muffs) • respirators • face masks • hard hats/helmet • gloves, aprons • eye protection (glasses, shield, visor) • non-slip footwear • appropriate clothing	LEAST

For further examples and explanation on the Hazard Management and Risk Control process, please refer to the Code of Practice for How to manage WHS Risks (2011).

NT – RISK ASSESSMENT(LONG FORM)

Stage 1:	Hazard Identification	Residual risk rating L, M, H, VH	M
Name or description of the activity(s) to be assessed	WA Lane marking and lane support systems (2018): Driving and steering to activate lane departure warning alarm	**Date**:	12/11/2018
Area, School/Branch Building/Room	CASR/ECMS		
Workers completing the risk assessment. Name and contact details	**MARIO MONGIARDINI**	**Mobile/Phone**	**0424 342 931**
	MARTIN ELSEGOOD	**Mobile/Phone**	**0416 802 436**
	JAMIE MACKENZIE	**Mobile/Phone**	**08 8313 7329**

- This template or equivalent template can be used. Please note that this list is not exhaustive, but can be used as the basis for your initial hazard identification.
- If you tick yes to any of the hazards listed below, then the hazard is to be transferred and addressed on **Appendix C2.**
  Where a number of activities have the same hazards, they may be grouped together on the same assessment and the same control measures applied to each.

Consider – is there potential for, or identified exposure to any of the following, as part of a process/activity

	Physical/Environmental Hazards		**Plant and Equipment hazards**
☐	Animals (e.g. hazardous wild animals, bees, snakes)	☐	Mobile lifting equipment or farm machinery
☐	Confined space entry (e.g. pit, tank, silo, entry through a hatch)	☐	Pressurised vessels/systems (e.g. autoclave, boiler)
☐	Fall from a height (e.g. ladder, elevated platform, cliff, scaffolding)	☐	Hazardous levels of heat or vibration (to whole or part body)
☐	Fire (potential for uncontrolled fire due to ignition sources)	☐	Hazardous plant (e.g. lathes, lasers, microtomes, cryostats,
☒	Flying or moving items/plant/vehicles, falling object(s)		or operations could result in amputation, eye injury, serious
☐	Hazardous terrain or environment including wet/slippery surfaces		laceration, crushing injury)
☐	Lighting/visibility is compromised and hazardous		**Radiation hazards**
☐	Noise or sound levels > 85dB(A) or peak level of greater than	☐	Sealed sources or unsealed sources
	135 dB(C) for any period of time	☐	Artificial sources (UV)
☐	Temperature or weather extremes (e.g. hypothermia, major burns)		**Biological hazards (e.g. via inhalation, contact, digestion)**
☐	Isolation (e.g. work in a remote area, difficult to access work site,	☐	Contamination (e.g. pathogens, body fluids)
	or a rescue effort would be difficult in the event of an emergency.	☐	Animal handling (e.g. bites, allergies)
☐	Boating and/or Diving (e.g. risk of drowning)	☐	Other
	Communications		**Chemical hazards**
☐	Communication problems (e.g. by virtue of location or isolation)	☐	Explosive substances
	Electrical	☐	Flammable substances, gas, airborne contaminants
☐	Electric shock	☐	Toxic or asphyxiate gas (e.g. CO_2 including dry ice, liquid N_2)
	Ergonomic/Hazardous Manual activity/task(s)	☐	Respiratory irritants (e.g. nanotech, dust, asbestos)
☐	Work requiring repetitive force or movement	☐	Chemical spraying (e.g. agricultural, pesticides)
☐	Sustained force/posture or awkward posture	☐	Prohibited and restricted carcinogens requiring a permit
☐	Working with animals, unpredictable/unbalanced loads	☐	Hazardous chemicals (not included above)
☐	Transfer of item(s) up or down stairs, using both hands or	☐	Other
	requiring the use of lifting equipment from one level to another		**Activity combines a number of different hazards, and**
	Stress/Duress hazards		**the impact/results of interaction is unknown e.g. mixing**
☐	Personal threat e.g. aggressive behaviour, abuse, threat, assault		**chemicals or recognised as a risk e.g. water and electricity.**
	(includes home visits)	☐	Specify -
☐	Fatigue e.g. from excessive work related mental/physical exertion		**High Risk Travel**
	Remote work location or working in isolation	☐	Destination is rated DFAT 3 or 4 (High/Very High)
☐	Medical emergency, difficult to administer/obtain first aid		**High risk work licence required in accordance with WHS Regs**
	gain assistance e.g. access to medical facilities	☐	Boom-type elevating work platform, scaffolding, dogging,
	Other		crane and hoist operation, reach stackers, forklift operation,
☐			pressure equipment operation.
☐			
☐		☐	**No hazards identified. No risk assessment required.**

HAZARD MANAGEMENT

Stage 2 and Stage 3 – Risk Assessment and Control

Record the potential hazards/issues identified in Hazard Identification Process on Appendix C1 **and** **When and where the hazard is present (i.e. when is the worker exposed?)**	**Inherent risk assessment rating** Before controls are implemented (Refer to the risk assessment Tables – Appendix C3) **L, M, H, VH**	**List the control measures implemented (i.e. in place)** • Control measures are to be in accordance with the Hierarchy of Control. Refer to Appendix C3 for examples. • Choose the control(s) that most effectively eliminate the hazard or minimises the risk. • Record the control measures in place under the relevant control measure (e.g. list in order under the following headings - substitution, isolation, engineering, administrative, Personal Protective Equipment). • Ensure that control measures do not introduce new hazards.	**Residual risk rating** After controls in place The highest rating is to be transferred to the top of page C1.
Traffic accident caused when testing lane departure warning alarm	**VH**	Admin – The speed limit will always be observed. Admin – The driver will drift towards the edge line slowly without any jerking of the steering wheel. Admin – The driver will be solely responsible for drifting towards the edge line. When the driver believes the wheel has come into contact with the line they will steer back calmly into the lane (whether or not the LDW system has activated). Admin – Pre-test drive through site to assess potential risks.	**Medium**
Traffic accident caused by distraction of other drivers	**VH**	Admin – Prior to the start of data collection, the passenger will check for traffic ahead and behind the vehicle. If there are other vehicles in the general vicinity the data collection for that run will be aborted (the vehicle will travel to the turnaround point to try again).	**Low**
Traffic accident caused during turn around	**VH**	Admin – Turning the vehicle around will only occur in designated areas that have been deemed safe. These areas will be identified during the initial site survey and safety audit. Admin – When turning around the driver will follow the road rules and ensure there is a sufficient gap between other road users.	**Medium**
Driver distracted by operation of equipment	**VH**	Admin – Driver will not operate equipment at any time while the vehicle is in motion. Admin – Passenger will be responsible for operation of equipment.	**Medium**
Driver distracted by equipment mount failing inside vehicle	**H**	Eng. – Cameras will be mounted with high pressure suction cup. Eng. – Camera cables will be routed and secured with adhesive tape. Admin – Cameras will be positioned such that they will not swing or drop into the driver should the suction cup fail.	**Low**
Driver distracted by equipment mount failing outside vehicle	**H**	Eng. – Cameras will be mounted with high pressure suction cup. Eng. – Camera cables will be routed and secured with adhesive tape. Eng. – Camera cables will be routed through the door seals such that the camera will not contact the road should the suction cup fail. Admin – If an external camera suction cup does fail, the driver will continue travelling to a safe location before pulling over.	**Low**
Equipment blocking driver's view of the road	**H**	Admin – Cameras will be located where they do not restrict the driver's field of vision.	**Low**
Equipment blocking driver's view of the instrument panel	**H**	Admin – Cameras will be located where they do not restrict the driver's view of the instrument panel, including the speed indication.	**Low**

Accident when driving at night due to limited visibility	**M**	Admin – Using appropriate headlights based on the condition of the road. Admin – Adjust speed based on limited visibility at night and potential wildlife crossing road.	**Medium**

Staff related activities (Note – Low and Medium Residual Risk does not require Manager/Supervisor authorisation)			**Student related activities**		
Author	**Name and Signature**		**Author**	**Name and Signature**	
High Residual Risk – Authorised by Manager/Supervisor	**Name and Signature/authority**		**Low and Medium Residual Risk – Authorised by Manager/Supervisor**	**Name and Signature/authority**	
High Residual Risk – Authorised by Head of School/Branch	**Name and Signature/authority**		**High Residual Risk – Authorised by Head of School/Branch**	**Name and Signature/authority**	
Very High Residual Risk – Authorised by VC&P	**Name and Signature/authority**		**Very High Residual Risk – Authorised by VC&P**	**Name and Signature/authority**	

HAZARD MANAGEMENT

RISK ASSESSMENT TABLES

Three essential steps are taken:

7. The probability or likelihood of an incident occurring is evaluated;
8. The severity of the potential consequences is calculated or estimated;
9. Based on these two factors, the risks are assigned priority for risk control through the use of a risk rating.

Risk assessment involves examining and evaluating the likelihood/severity/consequence in order to prioritise and implement adequate controls. The risk matrix has been adopted based on the principles of AS/NZS ISO 31000 (2009) Risk Management – Principles and Guidelines and Code of Practice "How to Manage Work Health and Safety Risks (2012).

Likelihood Table

CATEGORY	DESCRIPTION
Almost certain	There is an expectation that an event/incident will occur.
Likely	There is an expectation that an event/incident **could occur** but not certain to occur.
Slight	This expectation lies somewhere in the midpoint between "could" and "improbable".
Unlikely	There is an expectation that an event/incident is doubtful or **improbable** to occur.
Rare	There is no expectation that the event/incident will occur.

Consequences Table

CATEGORY	DESCRIPTION
Severe	Injury resulting in death, permanent incapacity.
Major	Injury requiring extensive medical treatment, hospitalisation, or activities could result in a Notifiable occurrence.
Moderate	Injury requires formal medical treatment (hospital outpatient/doctors visit etc), activities could result in an Improvement Notice.
Minor	Injury requires first aid.
Negligible	Injury requires minor first aid (e.g. bandaid), or result in short term discomfort (e.g. bruise, headache, muscular aches etc), no medical treatment.

Risk matrix

Likelihood	Consequences				
	Negligible	Minor	Moderate	Major	Severe
Almost Certain	Medium	High	Very High	Very High	Very High
Likely	Medium	Medium	High	Very High	Very High
Slight	Low	Medium	High	High	Very High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

If the level of risk is assessed as high or very high

- ❑ Stop the activity; or
- ❑ Tag out the plant/equipment; or
- ❑ Secure any chemical; and
- ❑ Determine if the activity is to:
  - ❑ continue; or
  - ❑ cease

in consultation with your Manager/Supervisor.

Follow the process in 3.5.6.1 where the risk cannot be reduced to medium or low.

HAZARD MANAGEMENT

HIERARCHY OF RISK CONTROL

Hierarchy of control			Examples of control measures	
HIGHEST	Level 1	Elimination	• Not introducing the hazard into the workplace. • Designing out the hazards before they are introduced. • Removing the hazard completely. • Not conducting the activity.	MOST
	If this is not practicable then ↓			
LEVEL OF HEALTH AND SAFETY PROTECTION	Level 2 Where it is not reasonably practicable to eliminate the hazards and associated risks.	Substitution	• Replacing or substituting the hazard with something safer.	RELIABILITY OF CONTROL MEASURES
		Isolation	• Isolating the hazard from the people by distance or using barriers.	
		Engineering	• Installing/using a control measure of a physical nature, including a mechanical device or process e.g. trolleys, hoists, guards, residual current devices, fume-hoods, extraction/ventilation systems, RCD protection.	
	↓			
	Level 3 These control measures do not control the hazard at the source. They rely on human behaviour and supervision, and used on their own tend to be the least effective in minimising risks.	Administrative	• Documenting a standard operating procedure (SOP) and include in the induction program for all staff required to perform the activity • Developing a proficiency based training program if required by the risk assessment (see definitions) (Workers may be trained against the SOP Appendix E or other assessment criteria.) • Training workers to use control measures implemented when carrying out the activity • Introducing a second operator • Providing signage or warning labels • Restricting access • Maintenance and testing programs • Changing the work organisation e.g. relocating equipment or items, rotating workers between different activities	
LOWEST	Exposure is only limited if the worker wears and uses the PPE correctly.	Personal Protective Equipment (PPE)	Requiring the use of one or more of the following: • ear protection (ear muffs) • respirators • face masks • hard hats/helmet • gloves, aprons • eye protection (glasses, shield, visor) • non-slip footwear • appropriate clothing	LEAST

For further examples and explanation on the Hazard Management and Risk Control process, please refer to the Code of Practice for How to manage WHS Risks (2011).

APPENDIX B

The tables below show the recorded details from all crossing events that were performed during this study. The recorded details are split into two tables; centrelines, and edge lines.

Table B.1 Warning events on centrelines

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
6	Day	North	Centre	Solid-Dash	20/11/2018	1	16:55	Dry	35	40	1	1	103	110	Failure (at the start).	1
6	Day	North	Centre	Solid-Dash	20/11/2018	1	16:55	Dry	35	40	2	0	103	110		0
6	Day	North	Centre	Solid-Dash	20/11/2018	2	17:01	Dry	36	35	1	0	104	110		0
6	Day	North	Centre	Solid-Dash	20/11/2018	2	17:01	Dry	36	35	2	1	104	110	Forced Error. Too small recovery distance.	
6	Day	North	Centre	Solid-Dash	20/11/2018	3	17:06	Dry	35	28	1	0	105	110		0
6	Day	North	Centre	Solid-Dash	20/11/2018	3	17:06	Dry	35	28	2	0	105	110		0
6	Day	North	Centre	Solid-Dash	20/11/2018	4	17:13	Dry	35	29	1	0	100	110		0
6	Day	North	Centre	Solid-Dash	20/11/2018	4	17:13	Dry	35	29	2	0	98	110		0
6	Day	South	Centre	Dash-Solid	20/11/2018	1	16:58	Dry/Glare	36	40	1	0	110	110		0
6	Day	South	Centre	Dash-Solid	20/11/2018	1	16:58	Dry/Glare	36	40	2	0	113	110		0
6	Day	South	Centre	Dash-Solid	20/11/2018	2	17:03	Dry/Glare	36	33	1	0	105	110		0
6	Day	South	Centre	Dash-Solid	20/11/2018	3	17:08	Dry/Glare	36	34	1	0	105	110		0
6	Day	South	Centre	Dash-Solid	20/11/2018	3	17:08	Dry/Glare	36	34	2	0	106	110		0
6	Day	South	Centre	Dash-Solid	20/11/2018	4	17:10	Dry/Glare	35	34	1	0	99	110		0
6	Day	South	Centre	Dash-Solid	20/11/2018	4	17:10	Dry/Glare	35	34	2	0	100	110		0
6	Night	North	Centre	Solid-Dash	23/11/2018	1	19:54	Dry	28	0	1	0	90	110		0
6	Night	North	Centre	Solid-Dash	23/11/2018	1	19:54	Dry	28	0	2	0	91	110		0
6	Night	North	Centre	Solid-Dash	23/11/2018	2	19:58	Dry	28	0	1	0	90	110		0
6	Night	North	Centre	Solid-Dash	23/11/2018	2	19:58	Dry	28	0	2	0	87	110		0
6	Night	North	Centre	Solid-Dash	23/11/2018	3	20:01	Dry	29	0	1	0	91	110		0
6	Night	North	Centre	Solid-Dash	23/11/2018	3	20:01	Dry	29	0	2	0	89	110		0
6	Night	North	Centre	Solid-Dash	23/11/2018	4	20:05	Dry	28	0	1	0	95	110		0
6	Night	North	Centre	Solid-Dash	23/11/2018	4	20:05	Dry	28	0	2	0	92	110		0
6	Night	South	Centre	Dash-Solid	23/11/2018	1	19:56	Dry	28	0	1	0	92	110		0
6	Night	South	Centre	Dash-Solid	23/11/2018	1	19:56	Dry	28	0	2	0	94	110		0
6	Night	South	Centre	Dash-Solid	23/11/2018	2	19:59	Dry	29	0	1	0	91	110		0
6	Night	South	Centre	Dash-Solid	23/11/2018	2	19:59	Dry	29	0	2	0	91	110		0
6	Night	South	Centre	Dash-Solid	23/11/2018	3	20:02	Dry	28	0	1	0	95	110		0
6	Night	South	Centre	Dash-Solid	23/11/2018	3	20:02	Dry	28	0	2	0	96	110		0
6	Night	South	Centre	Dash-Solid	23/11/2018	4	20:06	Dry	28	0	1	0	92	110		0
6	Night	South	Centre	Dash-Solid	23/11/2018	4	20:06	Dry	28	0	2	0	91	110		0
7	Day	North	Centre	Dash-Solid	20/11/2018	1	14:40	Dry	36	103	1	0	101	110		0
7	Day	North	Centre	Dash-Solid	20/11/2018	1	14:40	Dry	36	103	2	0	101	110		0
7	Day	North	Centre	Dash-Solid	20/11/2018	2	14:54	Dry	37	84	1	0	103	110		0
7	Day	North	Centre	Dash-Solid	20/11/2018	2	14:54	Dry	37	84	2	0	102	110		0
7	Day	North	Centre	Dash-Solid	20/11/2018	3	15:02	Dry	36	85	1	0	102	110		0
7	Day	North	Centre	Dash-Solid	20/11/2018	3	15:02	Dry	36	85	2	0	101	110		0
7	Day	North	Centre	Dash-Solid	20/11/2018	4	15:38	Dry	36	66	1	0	103	110		0
7	Day	North	Centre	Dash-Solid	20/11/2018	4	15:38	Dry	36	66	2	0	103	110		0
7	Day	South	Centre	Solid-Dash	20/11/2018	1	14:35	Dry	35	106	1	0	106	110		0
7	Day	South	Centre	Solid-Dash	20/11/2018	1	14:35	Dry	35	106	2	0	104	110		0
7	Day	South	Centre	Solid-Dash	20/11/2018	2	14:51	Dry	36	90	1	0	105	110		0
7	Day	South	Centre	Solid-Dash	20/11/2018	2	14:51	Dry	36	90	2	0	101	110		0
7	Day	South	Centre	Solid-Dash	20/11/2018	3	14:56	Dry	36	107	1	0	106	110		0
7	Day	South	Centre	Solid-Dash	20/11/2018	3	14:56	Dry	36	107	2	0	103	110		0
7	Day	South	Centre	Solid-Dash	20/11/2018	4	15:30	Dry	37	70	1	0	105	110		0
7	Day	South	Centre	Solid-Dash	20/11/2018	4	15:30	Dry	37	70	2	0	104	110		0
7	Night	North	Centre	Dash-Solid	23/11/2018	1	21:23	Dry	28	0	1	0	94	110		0
7	Night	North	Centre	Dash-Solid	23/11/2018	1	21:23	Dry	28	0	2	0	93	110		0
7	Night	North	Centre	Dash-Solid	23/11/2018	1	21:23	Dry	28	0	3	0	94	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
7	Night	North	Centre	Dash-Solid	23/11/2018	2	21:29	Dry	27	0	1	0	97	110		0
7	Night	North	Centre	Dash-Solid	23/11/2018	2	21:29	Dry	27	0	2	0	99	110		0
7	Night	North	Centre	Dash-Solid	23/11/2018	2	21:29	Dry	27	0	3	0	99	110		0
7	Night	North	Centre	Dash-Solid	23/11/2018	3	21:32	Dry	27	0	1	0	93	110		0
7	Night	North	Centre	Dash-Solid	23/11/2018	3	21:32	Dry	27	0	2	0	94	110		0
7	Night	North	Centre	Dash-Solid	23/11/2018	3	21:32	Dry	27	0	3	0	94	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	1	21:22	Dry	27	0	1	0	87	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	1	21:22	Dry	27	0	2	0	90	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	1	21:22	Dry	27	0	3	0	89	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	2	21:25	Dry	27	0	1	0	89	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	2	21:25	Dry	27	0	2	0	91	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	2	21:25	Dry	27	0	3	0	94	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	3	21:31	Dry	27	0	1	0	91	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	3	21:31	Dry	27	0	2	0	90	110		0
7	Night	South	Centre	Solid-Dash	23/11/2018	3	21:31	Dry	27	0	3	0	89	110		0
8	Day	North	Centre	Dash	21/11/2018	1	17:22	Dry	36	22	1	0	106	110		0
8	Day	North	Centre	Dash	21/11/2018	1	17:22	Dry	36	22	2	0	105	110		0
8	Day	North	Centre	Dash	21/11/2018	1	17:22	Dry	36	22	3	0	106	110		0
8	Day	North	Centre	Dash	21/11/2018	1	17:22	Dry	36	22	4	0	100	110		0
8	Day	North	Centre	Dash	21/11/2018	2	17:26	Dry	36	22	1	0	104	110		0
8	Day	North	Centre	Dash	21/11/2018	2	17:26	Dry	36	22	2	0	104	110		0
8	Day	North	Centre	Dash	21/11/2018	2	17:26	Dry	36	22	3	0	104	110		0
8	Day	North	Centre	Dash	21/11/2018	2	17:26	Dry	36	22	4	0	106	110		0
8	Day	North	Centre	Dash	21/11/2018	3	17:28	Dry	35	20	1	0	102	110		0
8	Day	North	Centre	Dash	21/11/2018	3	17:28	Dry	35	20	2	0	101	110		0
8	Day	North	Centre	Dash	21/11/2018	3	17:28	Dry	35	20	3	0	105	110		0
8	Day	North	Centre	Dash	21/11/2018	3	17:28	Dry	35	20	4	0	104	110		0
8	Day	South	Centre	Dash	21/11/2018	1	17:23	Dry/Glare	36	25	1	0	104	110		0
8	Day	South	Centre	Dash	21/11/2018	1	17:23	Dry/Glare	36	25	2	0	107	110		0
8	Day	South	Centre	Dash	21/11/2018	1	17:23	Dry/Glare	36	25	3	0	110	110		0
8	Day	South	Centre	Dash	21/11/2018	1	17:23	Dry/Glare	36	25	4	0	112	110		0
8	Day	South	Centre	Dash	21/11/2018	2	17:26	Dry/Glare	35	23	1	0	98	110		0
8	Day	South	Centre	Dash	21/11/2018	2	17:26	Dry/Glare	35	23	2	0	101	110		0
8	Day	South	Centre	Dash	21/11/2018	2	17:26	Dry/Glare	35	23	3	0	101	110		0
8	Day	South	Centre	Dash	21/11/2018	2	17:26	Dry/Glare	35	23	4	0	101	110		0
8	Day	South	Centre	Dash	21/11/2018	3	17:30	Dry/Glare	35	20	1	0	102	110		0
8	Day	South	Centre	Dash	21/11/2018	3	17:30	Dry/Glare	35	20	2	0	108	110		0
8	Day	South	Centre	Dash	21/11/2018	3	17:30	Dry/Glare	35	20	3	0	105	110		0
8	Day	South	Centre	Dash	21/11/2018	3	17:30	Dry/Glare	35	20	4	0	103	110		0
8	Night	North	Centre	Dash	23/11/2018	1	21:54	Dry	28	0	1	0	100	110		0
8	Night	North	Centre	Dash	23/11/2018	1	21:54	Dry	28	0	2	0	101	110		0
8	Night	North	Centre	Dash	23/11/2018	1	21:54	Dry	28	0	3	0	104	110		0
8	Night	North	Centre	Dash	23/11/2018	1	21:54	Dry	28	0	4	0	107	110		0
8	Night	North	Centre	Dash	23/11/2018	1	21:54	Dry	28	0	5	0	105	110		0
8	Night	North	Centre	Dash	23/11/2018	2	21:57	Dry	27	0	1	0	98	110		0
8	Night	North	Centre	Dash	23/11/2018	2	21:57	Dry	27	0	2	0	104	110		0
8	Night	North	Centre	Dash	23/11/2018	2	21:57	Dry	27	0	3	0	105	110		0
8	Night	North	Centre	Dash	23/11/2018	2	21:57	Dry	27	0	4	0	105	110		0
8	Night	North	Centre	Dash	23/11/2018	2	21:57	Dry	27	0	5	0	103	110		0
8	Night	South	Centre	Dash	23/11/2018	1	21:51	Dry	27	0	1	0	91	110		0
8	Night	South	Centre	Dash	23/11/2018	1	21:51	Dry	27	0	2	0	98	110		0
8	Night	South	Centre	Dash	23/11/2018	1	21:51	Dry	27	0	3	0	101	110		0
8	Night	South	Centre	Dash	23/11/2018	1	21:51	Dry	27	0	4	0	100	110		0
8	Night	South	Centre	Dash	23/11/2018	1	21:51	Dry	27	0	5	0	100	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
8	Night	South	Centre	Dash	23/11/2018	2	21:55	Dry	27	0	1	0	100	110		0
8	Night	South	Centre	Dash	23/11/2018	2	21:55	Dry	27	0	2	0	99	110		0
8	Night	South	Centre	Dash	23/11/2018	2	21:55	Dry	27	0	3	0	98	110		0
8	Night	South	Centre	Dash	23/11/2018	2	21:55	Dry	27	0	4	0	102	110		0
8	Night	South	Centre	Dash	23/11/2018	2	21:55	Dry	27	0	5	0	100	110		0
9	Day	North	Centre	Double Solid	22/11/2018	1	17:05	Dry	38	40	1	0	103	110		0
9	Day	North	Centre	Double Solid	22/11/2018	1	17:05	Dry	38	40	2	1	102	110	Forced Error. Nil recovery distance.	
9	Day	North	Centre	Double Solid	22/11/2018	1	17:05	Dry	38	40	3	1	98	110	Questionable Error. Line formation error.	
9	Day	North	Centre	Double Solid	22/11/2018	1	17:05	Dry	38	40	4	0	97	110		0
9	Day	North	Centre	Double Solid	22/11/2018	2	17:11	Dry	38	35	1	0	94	110		0
9	Day	North	Centre	Double Solid	22/11/2018	2	17:11	Dry	38	35	2	0	97	110		0
9	Day	North	Centre	Double Solid	22/11/2018	2	17:11	Dry	38	35	3	0	101	110		0
9	Day	North	Centre	Double Solid	22/11/2018	2	17:11	Dry	38	35	4	0	100	110		0
9	Day	North	Centre	Double Solid	22/11/2018	3	17:16	Dry	38	33	1	0	99	110		0
9	Day	North	Centre	Double Solid	22/11/2018	3	17:16	Dry	38	33	2	0	100	110		0
9	Day	North	Centre	Double Solid	22/11/2018	3	17:16	Dry	38	33	3	0	102	110	Interesting - late warning.	0
9	Day	North	Centre	Double Solid	22/11/2018	3	17:16	Dry	38	33	4	0	102	110		0
9	Day	South	Centre	Double Solid	22/11/2018	1	17:03	Dry	39	32	1	0	94	110		0
9	Day	South	Centre	Double Solid	22/11/2018	1	17:03	Dry	39	32	2	0	95	110		0
9	Day	South	Centre	Double Solid	22/11/2018	1	17:03	Dry	39	32	3	0	100	110		0
9	Day	South	Centre	Double Solid	22/11/2018	1	17:03	Dry	39	32	4	0	96	110		0
9	Day	South	Centre	Double Solid	22/11/2018	2	17:08	Dry	39	30	1	0	104	110		0
9	Day	South	Centre	Double Solid	22/11/2018	2	17:08	Dry	39	30	2	0	104	110		0
9	Day	South	Centre	Double Solid	22/11/2018	2	17:08	Dry	39	30	3	0	105	110		0
9	Day	South	Centre	Double Solid	22/11/2018	2	17:08	Dry	39	30	4	0	109	110		0
9	Day	South	Centre	Double Solid	22/11/2018	3	17:13	Dry	39	28	1	0	105	110		0
9	Day	South	Centre	Double Solid	22/11/2018	3	17:13	Dry	39	28	2	1	104	110	Forced Error. Too small recovery distance.	
9	Day	South	Centre	Double Solid	22/11/2018	3	17:13	Dry	39	28	3	0	103	110		0
9	Day	South	Centre	Double Solid	22/11/2018	3	17:13	Dry	39	28	4	0	106	110		0
9	Night	North	Centre	Double Solid	22/11/2018	1	22:23	Dry	28	0	1	0	90	110		0
9	Night	North	Centre	Double Solid	22/11/2018	1	22:23	Dry	28	0	2	0	87	110		0
9	Night	North	Centre	Double Solid	22/11/2018	1	22:23	Dry	28	0	3	0	91	110	Interesting - late warning.	0
9	Night	North	Centre	Double Solid	22/11/2018	1	22:23	Dry	28	0	4	0	87	110		0
9	Night	North	Centre	Double Solid	22/11/2018	2	22:27	Dry	29	0	1	0	97	110		0
9	Night	North	Centre	Double Solid	22/11/2018	2	22:27	Dry	29	0	2	0	95	110		0
9	Night	North	Centre	Double Solid	22/11/2018	2	22:27	Dry	29	0	3	1	95	110	Questionable Error. Line formation error.	
9	Night	North	Centre	Double Solid	22/11/2018	2	22:27	Dry	29	0	4	0	95	110		0
9	Night	South	Centre	Double Solid	22/11/2018	1	22:21	Dry	28	0	1	0	87	110		0
9	Night	South	Centre	Double Solid	22/11/2018	1	22:21	Dry	28	0	2	0	87	110		0
9	Night	South	Centre	Double Solid	22/11/2018	1	22:21	Dry	28	0	3	0	84	110		0
9	Night	South	Centre	Double Solid	22/11/2018	1	22:21	Dry	28	0	4	0	94	110		0
9	Night	South	Centre	Double Solid	22/11/2018	1	22:21	Dry	28	0	5	0	98	110		0
9	Night	South	Centre	Double Solid	22/11/2018	2	22:25	Dry	29	0	1	0	97	110		0
9	Night	South	Centre	Double Solid	22/11/2018	2	22:25	Dry	29	0	2	0	98	110		0
9	Night	South	Centre	Double Solid	22/11/2018	2	22:25	Dry	29	0	3	0	100	110		0
9	Night	South	Centre	Double Solid	22/11/2018	2	22:25	Dry	29	0	4	0	101	110		0
9	Night	South	Centre	Double Solid	22/11/2018	2	22:25	Dry	29	0	5	0	101	110		0
10	Day	North	Centre	Double Solid	22/11/2018	1	15:32	Dry	39	60	1	0	65	70		0
10	Day	North	Centre	Double Solid	22/11/2018	1	15:32	Dry	39	60	2	0	69	70		0
10	Day	North	Centre	Double Solid	22/11/2018	1	15:32	Dry	39	60	3	0	68	70		0
10	Day	North	Centre	Double Solid	22/11/2018	2	15:39	Dry	40	78	1	0	61	70		0
10	Day	North	Centre	Double Solid	22/11/2018	2	15:39	Dry	40	78	2	0	63	70	Over tyre marks.	0
10	Day	North	Centre	Double Solid	22/11/2018	2	15:39	Dry	40	78	3	0	63	70		0
10	Day	North	Centre	Double Solid	22/11/2018	3	15:43	Dry	41	68	1	0	64	70		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
10	Day	North	Centre	Double Solid	22/11/2018	3	15:43	Dry	41	68	2	0	65	70		0
10	Day	North	Centre	Double Solid	22/11/2018	3	15:43	Dry	41	68	3	0	63	70		0
10	Day	South	Centre	Double Solid	22/11/2018	1	15:35	Dry	39	75	1	0	69	70		0
10	Day	South	Centre	Double Solid	22/11/2018	1	15:35	Dry	39	75	2	0	67	70		0
10	Day	South	Centre	Double Solid	22/11/2018	1	15:35	Dry	39	75	3	0	66	70	Over tyre marks.	0
10	Day	South	Centre	Double Solid	22/11/2018	1	15:35	Dry	39	75	4	0	63	70		0
10	Day	South	Centre	Double Solid	22/11/2018	2	15:41	Dry	41	80	1	0	58	70		0
10	Day	South	Centre	Double Solid	22/11/2018	2	15:41	Dry	41	80	2	0	63	70		0
10	Day	South	Centre	Double Solid	22/11/2018	2	15:41	Dry	41	80	3	0	60	70		0
10	Day	South	Centre	Double Solid	22/11/2018	2	15:41	Dry	41	80	4	0	60	70		0
10	Day	South	Centre	Double Solid	22/11/2018	3	15:46	Dry	39	68	1	0	65	70		0
10	Day	South	Centre	Double Solid	22/11/2018	3	15:46	Dry	39	68	2	0	66	70		0
10	Day	South	Centre	Double Solid	22/11/2018	3	15:46	Dry	39	68	3	0	66	70		0
10	Day	South	Centre	Double Solid	22/11/2018	3	15:46	Dry	39	68	4	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	1	22:13	Dry	31	0	1	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	1	22:13	Dry	31	0	2	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	1	22:13	Dry	31	0	3	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	1	22:13	Dry	31	0	4	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	1	22:13	Dry	31	0	5	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	2	22:17	Dry	31	0	1	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	2	22:17	Dry	31	0	2	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	2	22:17	Dry	31	0	3	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	2	22:17	Dry	31	0	4	0	66	70		0
10	Night	North	Centre	Double Solid	22/11/2018	2	22:17	Dry	31	0	5	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	1	22:12	Dry	30	0	1	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	1	22:12	Dry	30	0	2	0	67	70		0
10	Night	South	Centre	Double Solid	22/11/2018	1	22:12	Dry	30	0	3	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	1	22:12	Dry	30	0	4	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	1	22:12	Dry	30	0	5	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	2	22:15	Dry	30	0	1	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	2	22:15	Dry	30	0	2	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	2	22:15	Dry	30	0	3	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	2	22:15	Dry	30	0	4	0	66	70		0
10	Night	South	Centre	Double Solid	22/11/2018	2	22:15	Dry	30	0	5	0	66	70		0
12	Day	North	Centre	Double Solid	22/11/2018	1	18:09	Dry	37	3	1	0	66	70		0
12	Day	North	Centre	Double Solid	22/11/2018	1	18:09	Dry	37	3	2	0	66	70		0
12	Day	North	Centre	Double Solid	22/11/2018	1	18:09	Dry	37	3	3	0	69	70		0
12	Day	North	Centre	Double Solid	22/11/2018	2	18:14	Dry	37	4	1	0	63	70		0
12	Day	North	Centre	Double Solid	22/11/2018	2	18:14	Dry	37	4	2	0	61	70		0
12	Day	North	Centre	Double Solid	22/11/2018	2	18:14	Dry	37	4	3	0	64	70		0
12	Day	North	Centre	Double Solid	22/11/2018	2	18:14	Dry	37	4	4	0	62	70		0
12	Day	North	Centre	Double Solid	22/11/2018	3	18:18	Dry	36	2	1	0	67	70		0
12	Day	North	Centre	Double Solid	22/11/2018	3	18:18	Dry	36	2	2	0	66	70		0
12	Day	North	Centre	Double Solid	22/11/2018	3	18:18	Dry	36	2	3	0	64	70		0
12	Day	North	Centre	Double Solid	22/11/2018	3	18:18	Dry	36	2	4	1	61	70	Forced Error. Too small recovery distance.	
12	Day	South	Centre	Double Solid	22/11/2018	1	18:05	Dry	37	5	1	0	69	70	Two false positives after this one.	0
12	Day	South	Centre	Double Solid	22/11/2018	1	18:05	Dry	37	5	2	0	62	70		0
12	Day	South	Centre	Double Solid	22/11/2018	1	18:05	Dry	37	5	3	0	61	70		0
12	Day	South	Centre	Double Solid	22/11/2018	2	18:12	Dry	37	2.5	1	0	64	70		0
12	Day	South	Centre	Double Solid	22/11/2018	2	18:12	Dry	37	2.5	2	1	63	70	Forced Error. Too small recovery distance.	
12	Day	South	Centre	Double Solid	22/11/2018	2	18:12	Dry	37	2.5	3	0	64	70	False positive just before this one.	0
12	Day	South	Centre	Double Solid	22/11/2018	3	18:15	Dry	36	2.2	1	0	67	70		0
12	Day	South	Centre	Double Solid	22/11/2018	3	18:15	Dry	36	2.2	2	0	66	70		0
12	Day	South	Centre	Double Solid	22/11/2018	3	18:15	Dry	36	2.2	3	0	64	70	False positive near this one.	0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
12	Day	South	Centre	Double Solid	22/11/2018	3	18:15	Dry	36	2.2	4	0	61	70		0
12	Night	North	Centre	Double Solid	22/11/2018	1	21:18	Dry	32	0	1	0	66	70		0
12	Night	North	Centre	Double Solid	22/11/2018	1	21:18	Dry	32	0	2	0	63	70		0
12	Night	North	Centre	Double Solid	22/11/2018	1	21:18	Dry	32	0	3	1	63	70	Forced Error. Too small recovery distance.	
12	Night	North	Centre	Double Solid	22/11/2018	1	21:18	Dry	32	0	4	0	65	70		0
12	Night	North	Centre	Double Solid	22/11/2018	1	21:18	Dry	32	0	5	0	66	70		0
12	Night	North	Centre	Double Solid	22/11/2018	2	21:24	Dry	32	0	1	0	64	70		0
12	Night	North	Centre	Double Solid	22/11/2018	2	21:24	Dry	32	0	2	0	60	70		0
12	Night	North	Centre	Double Solid	22/11/2018	2	21:24	Dry	32	0	3	0	61	70		0
12	Night	North	Centre	Double Solid	22/11/2018	2	21:24	Dry	32	0	4	0	62	70		0
12	Night	North	Centre	Double Solid	22/11/2018	2	21:24	Dry	32	0	5	0	64	70		0
12	Night	South	Centre	Double Solid	22/11/2018	1	21:21	Dry	32	0	1	0	68	70		0
12	Night	South	Centre	Double Solid	22/11/2018	1	21:21	Dry	32	0	2	0	65	70		0
12	Night	South	Centre	Double Solid	22/11/2018	1	21:21	Dry	32	0	3	0	63	70		0
12	Night	South	Centre	Double Solid	22/11/2018	2	21:26	Dry	32	0	1	0	62	70		0
12	Night	South	Centre	Double Solid	22/11/2018	2	21:26	Dry	32	0	2	0	58	70		0
12	Night	South	Centre	Double Solid	22/11/2018	2	21:26	Dry	32	0	3	0	60	70		0
12	Night	South	Centre	Double Solid	22/11/2018	2	21:26	Dry	32	0	4	0	57	70		0
12	Night	South	Centre	Double Solid	22/11/2018	2	21:26	Dry	32	0	5	0	63	70		0
13	Day	North	Centre	Dash	21/11/2018	1	10:58	Dry	32	127	1	0	86	90		0
13	Day	North	Centre	Dash	21/11/2018	1	10:58	Dry	32	127	2	0	86	90		0
13	Day	North	Centre	Dash	21/11/2018	1	10:58	Dry	32	127	3	0	90	100		0
13	Day	North	Centre	Dash	21/11/2018	2	11:05	Dry	34	125	1	0	87	90		0
13	Day	North	Centre	Dash	21/11/2018	2	11:05	Dry	34	125	2	0	88	100		0
13	Day	North	Centre	Dash	21/11/2018	2	11:05	Dry	34	125	3	0	89	100		0
13	Day	North	Centre	Dash	21/11/2018	3	11:08	Dry	33	127	1	0	89	90		0
13	Day	North	Centre	Dash	21/11/2018	3	11:08	Dry	33	127	2	0	94	100		0
13	Day	North	Centre	Dash	21/11/2018	3	11:08	Dry	33	127	3	0	98	100		0
13	Day	South	Centre	Dash	21/11/2018	1	10:51	Dry	32	127	1	0	93	100		0
13	Day	South	Centre	Dash	21/11/2018	1	10:51	Dry	32	127	2	0	89	90		0
13	Day	South	Centre	Dash	21/11/2018	1	10:51	Dry	32	127	3	0	80	90		0
13	Day	South	Centre	Dash	21/11/2018	2	11:02	Dry	33	127	1	1	101	100	Failure (at the start).	1
13	Day	South	Centre	Dash	21/11/2018	2	11:02	Dry	33	127	2	0	93	90		0
13	Day	South	Centre	Dash	21/11/2018	2	11:02	Dry	33	127	3	0	84	90		0
13	Day	South	Centre	Dash	21/11/2018	3	11:07	Dry	33	127	1	0	98	100		0
13	Day	South	Centre	Dash	21/11/2018	3	11:07	Dry	33	127	2	0	89	90		0
13	Day	South	Centre	Dash	21/11/2018	3	11:07	Dry	33	127	3	0	81	90		0
13	Night	North	Centre	Dash	22/11/2018	1	20:59	Dry	32	0	1	0	82	90		0
13	Night	North	Centre	Dash	22/11/2018	1	20:59	Dry	32	0	2	0	83	90		0
13	Night	North	Centre	Dash	22/11/2018	1	20:59	Dry	32	0	3	0	82	90		0
13	Night	North	Centre	Dash	22/11/2018	1	20:59	Dry	32	0	4	0	84	90		0
13	Night	North	Centre	Dash	22/11/2018	1	20:59	Dry	32	0	5	0	85	90		0
13	Night	North	Centre	Dash	22/11/2018	2	21:02	Dry	32	0	1	0	86	90		0
13	Night	North	Centre	Dash	22/11/2018	2	21:02	Dry	32	0	2	0	85	90		0
13	Night	North	Centre	Dash	22/11/2018	2	21:02	Dry	32	0	3	0	83	90		0
13	Night	North	Centre	Dash	22/11/2018	2	21:02	Dry	32	0	4	0	83	90		0
13	Night	North	Centre	Dash	22/11/2018	2	21:02	Dry	32	0	5	0	84	90		0
13	Night	South	Centre	Dash	22/11/2018	1	21:00	Dry	33	0	1	0	81	90		0
13	Night	South	Centre	Dash	22/11/2018	1	21:00	Dry	33	0	2	0	86	90		0
13	Night	South	Centre	Dash	22/11/2018	1	21:00	Dry	33	0	3	0	84	90		0
13	Night	South	Centre	Dash	22/11/2018	1	21:00	Dry	33	0	4	0	86	90		0
13	Night	South	Centre	Dash	22/11/2018	1	21:00	Dry	33	0	5	0	86	90		0
13	Night	South	Centre	Dash	22/11/2018	2	21:04	Dry	32	0	1	0	84	90		0
13	Night	South	Centre	Dash	22/11/2018	2	21:04	Dry	32	0	2	0	85	90		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
13	Night	South	Centre	Dash	22/11/2018	2	21:04	Dry	32	0	3	0	88	90		0
13	Night	South	Centre	Dash	22/11/2018	2	21:04	Dry	32	0	4	0	87	90		0
13	Night	South	Centre	Dash	22/11/2018	2	21:04	Dry	32	0	5	0	86	90		0
14	Day	North	Centre	Double Solid	21/11/2018	1	11:52	Dry	35	130	1	0	103	110		0
14	Day	North	Centre	Double Solid	21/11/2018	1	11:52	Dry	35	130	2	0	102	110		0
14	Day	North	Centre	Double Solid	21/11/2018	1	11:52	Dry	35	130	3	0	103	110		0
14	Day	North	Centre	Double Solid	21/11/2018	2	11:58	Dry	35	130	1	0	101	110		0
14	Day	North	Centre	Double Solid	21/11/2018	2	11:58	Dry	35	130	2	0	103	110		0
14	Day	North	Centre	Double Solid	21/11/2018	2	11:58	Dry	35	130	3	0	105	110		0
14	Day	North	Centre	Double Solid	21/11/2018	3	12:01	Dry	34	129	1	0	100	110		0
14	Day	North	Centre	Double Solid	21/11/2018	3	12:01	Dry	34	129	2	0	102	110		0
14	Day	North	Centre	Double Solid	21/11/2018	3	12:01	Dry	34	129	3	0	103	110		0
14	Day	South	Centre	Double Solid	21/11/2018	1	11:49	Dry	35	131	1	0	106	110		0
14	Day	South	Centre	Double Solid	21/11/2018	1	11:49	Dry	35	131	2	0	108	110		0
14	Day	South	Centre	Double Solid	21/11/2018	1	11:49	Dry	35	131	3	0	109	110		0
14	Day	South	Centre	Double Solid	21/11/2018	2	11:55	Dry	35	130	1	0	105	110		0
14	Day	South	Centre	Double Solid	21/11/2018	2	11:55	Dry	35	130	2	0	105	110		0
14	Day	South	Centre	Double Solid	21/11/2018	2	11:55	Dry	35	130	3	0	106	110		0
14	Day	South	Centre	Double Solid	21/11/2018	3	11:59	Dry	34	130	1	0	107	110		0
14	Day	South	Centre	Double Solid	21/11/2018	3	11:59	Dry	34	130	2	0	110	110		0
14	Day	South	Centre	Double Solid	21/11/2018	3	11:59	Dry	34	130	3	0	110	110		0
14	Night	North	Centre	Double Solid	22/11/2018	1	19:58	Dry	34	0	1	0	89	110		0
14	Night	North	Centre	Double Solid	22/11/2018	1	19:58	Dry	34	0	2	0	89	110		0
14	Night	North	Centre	Double Solid	22/11/2018	1	19:58	Dry	34	0	3	0	89	110		0
14	Night	North	Centre	Double Solid	22/11/2018	1	19:58	Dry	34	0	4	0	89	110		0
14	Night	North	Centre	Double Solid	22/11/2018	2	20:02	Dry	34	0	1	0	94	110		0
14	Night	North	Centre	Double Solid	22/11/2018	2	20:02	Dry	34	0	2	0	99	110		0
14	Night	North	Centre	Double Solid	22/11/2018	2	20:02	Dry	34	0	3	0	103	110		0
14	Night	North	Centre	Double Solid	22/11/2018	2	20:02	Dry	34	0	4	0	103	110		0
14	Night	North	Centre	Double Solid	22/11/2018	3	20:05	Dry	33	0	1	0	100	110		0
14	Night	North	Centre	Double Solid	22/11/2018	3	20:05	Dry	33	0	2	0	105	110		0
14	Night	North	Centre	Double Solid	22/11/2018	3	20:05	Dry	33	0	3	0	105	110		0
14	Night	North	Centre	Double Solid	22/11/2018	3	20:05	Dry	33	0	4	0	106	110		0
14	Night	South	Centre	Double Solid	22/11/2018	1	20:00	Dry	34	0	1	0	97	110		0
14	Night	South	Centre	Double Solid	22/11/2018	1	20:00	Dry	34	0	2	0	99	110		0
14	Night	South	Centre	Double Solid	22/11/2018	1	20:00	Dry	34	0	3	0	104	110		0
14	Night	South	Centre	Double Solid	22/11/2018	1	20:00	Dry	34	0	4	1	105	110	Forced Error. Nil recovery distance.	
14	Night	South	Centre	Double Solid	22/11/2018	2	20:04	Dry	33	0	1	0	98	110		0
14	Night	South	Centre	Double Solid	22/11/2018	2	20:04	Dry	33	0	2	0	102	110		0
14	Night	South	Centre	Double Solid	22/11/2018	2	20:04	Dry	33	0	3	0	104	110		0
14	Night	South	Centre	Double Solid	22/11/2018	2	20:04	Dry	33	0	4	0	107	110		0
14	Night	South	Centre	Double Solid	22/11/2018	3	20:07	Dry	33	0	1	0	102	110		0
14	Night	South	Centre	Double Solid	22/11/2018	3	20:07	Dry	33	0	2	0	104	110		0
14	Night	South	Centre	Double Solid	22/11/2018	3	20:07	Dry	33	0	3	0	107	110		0
14	Night	South	Centre	Double Solid	22/11/2018	3	20:07	Dry	33	0	4	0	109	110		0
15	Day	North	Centre	Solid-Dash	21/11/2018	1	13:18	Dry	37	120	1	0	105	110		0
15	Day	North	Centre	Solid-Dash	21/11/2018	1	13:18	Dry	37	120	2	0	105	110		0
15	Day	North	Centre	Solid-Dash	21/11/2018	2	13:21	Dry	36	120	1	0	105	110		0
15	Day	North	Centre	Solid-Dash	21/11/2018	2	13:21	Dry	36	120	2	0	102	110		0
15	Day	North	Centre	Solid-Dash	21/11/2018	2	13:21	Dry	36	120	3	0	100	110		0
15	Day	North	Centre	Solid-Dash	21/11/2018	3	13:33	Dry	35	120	1	0	107	110		0
15	Day	North	Centre	Solid-Dash	21/11/2018	3	13:33	Dry	35	120	2	0	108	110		0
15	Day	North	Centre	Solid-Dash	21/11/2018	3	13:33	Dry	35	120	3	0	106	110		0
15	Day	South	Centre	Dash-Solid	21/11/2018	1	13:15	Dry	37	120	1	0	102	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
15	Day	South	Centre	Dash-Solid	21/11/2018	1	13:15	Dry	37	120	2	0	100	110		0
15	Day	South	Centre	Dash-Solid	21/11/2018	1	13:15	Dry	37	120	3	0	99	110		0
15	Day	South	Centre	Dash-Solid	21/11/2018	2	13:20	Dry	37	122	1	0	107	110		0
15	Day	South	Centre	Dash-Solid	21/11/2018	2	13:20	Dry	37	122	2	0	106	110		0
15	Day	South	Centre	Dash-Solid	21/11/2018	2	13:20	Dry	37	122	3	0	104	110	Quick events.	0
15	Day	South	Centre	Dash-Solid	21/11/2018	3	13:24	Dry	35	115	1	0	103	110		0
15	Day	South	Centre	Dash-Solid	21/11/2018	3	13:24	Dry	35	115	2	0	102	110		0
15	Day	South	Centre	Dash-Solid	21/11/2018	3	13:24	Dry	35	115	3	0	100	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	1	0:04	Dry	27	0	1	0	95	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	1	0:04	Dry	27	0	2	0	95	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	1	0:04	Dry	27	0	3	0	94	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	2	0:08	Dry	26	0	1	0	97	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	2	0:08	Dry	26	0	2	0	96	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	2	0:08	Dry	26	0	3	0	96	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	3	0:10	Dry	26	0	1	0	99	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	3	0:10	Dry	26	0	2	0	96	110		0
15	Night	North	Centre	Solid-Dash	24/11/2018	3	0:10	Dry	26	0	3	0	94	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	1	0:03	Dry	26	0	1	0	99	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	1	0:03	Dry	26	0	2	0	97	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	1	0:03	Dry	26	0	3	0	98	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	2	0:06	Dry	26	0	1	0	98	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	2	0:06	Dry	26	0	2	0	100	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	2	0:06	Dry	26	0	3	0	99	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	3	0:09	Dry	26	0	1	0	96	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	3	0:09	Dry	26	0	2	0	97	110		0
15	Night	South	Centre	Dash-Solid	24/11/2018	3	0:09	Dry	26	0	3	0	102	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	1	15:14	Dry	36	61	1	0	101	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	1	15:14	Dry	36	61	2	0	102	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	1	15:14	Dry	36	61	3	0	100	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	2	15:20	Dry	36	94	1	0	100	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	2	15:20	Dry	36	94	2	0	96	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	2	15:20	Dry	36	94	3	0	98	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	3	15:26	Dry	36	80	1	0	104	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	3	15:26	Dry	36	80	2	0	105	110		0
16	Day	North	Centre	Dash-Solid	21/11/2018	3	15:26	Dry	36	80	3	0	103	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	1	15:15	Dry	35	87	1	0	105	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	1	15:15	Dry	35	87	2	0	105	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	1	15:15	Dry	35	87	3	0	103	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	2	15:19	Dry	36	88	1	0	104	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	2	15:19	Dry	36	88	2	0	102	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	2	15:19	Dry	36	88	3	0	99	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	3	15:24	Dry	35	98	1	0	110	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	3	15:24	Dry	35	98	2	0	108	110		0
16	Day	South	Centre	Solid-Dash	21/11/2018	3	15:24	Dry	35	98	3	0	105	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	1	23:01	Dry	26	0	1	0	93	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	1	23:01	Dry	26	0	2	0	93	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	1	23:01	Dry	26	0	3	0	92	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	2	23:03	Dry	27	0	1	0	99	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	2	23:03	Dry	27	0	2	0	99	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	2	23:03	Dry	27	0	3	0	100	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	3	23:07	Dry	26	0	1	0	100	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	3	23:07	Dry	26	0	2	0	99	110		0
16	Night	North	Centre	Dash-Solid	23/11/2018	3	23:07	Dry	26	0	3	0	98	110		0
16	Night	South	Centre	Solid-Dash	23/11/2018	1	23:02	Dry	27	0	1	0	101	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
16	Night	South	Centre	Solid-Dash	23/11/2018	1	23:02	Dry	27	0	2	0	99	110		0
16	Night	South	Centre	Solid-Dash	23/11/2018	1	23:02	Dry	27	0	3	0	98	110		0
16	Night	South	Centre	Solid-Dash	23/11/2018	2	23:05	Dry	26	0	1	0	98	110		0
16	Night	South	Centre	Solid-Dash	23/11/2018	2	23:05	Dry	26	0	2	0	96	110		0
16	Night	South	Centre	Solid-Dash	23/11/2018	2	23:05	Dry	26	0	3	0	96	110		0
16	Night	South	Centre	Solid-Dash	23/11/2018	3	23:08	Dry	26	0	1	0	102	110		0
16	Night	South	Centre	Solid-Dash	23/11/2018	3	23:08	Dry	26	0	2	0	97	110		0
16	Night	South	Centre	Solid-Dash	23/11/2018	3	23:08	Dry	26	0	3	0	95	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	1	16:13	Dry	37	65	1	0	100	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	1	16:13	Dry	37	65	2	0	96	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	1	16:13	Dry	37	65	3	0	95	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	2	16:19	Dry	36	60	1	0	101	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	2	16:19	Dry	36	60	2	0	99	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	2	16:19	Dry	36	60	3	0	99	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	3	16:22	Dry	36	60	1	0	102	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	3	16:22	Dry	36	60	2	0	100	110		0
17	Day	North	Centre	Dash-Solid	21/11/2018	3	16:22	Dry	36	60	3	0	100	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	1	16:10	Dry	37	66	1	0	105	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	1	16:10	Dry	37	66	2	0	105	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	1	16:10	Dry	37	66	3	0	105	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	2	16:14	Dry	37	60	1	0	104	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	2	16:14	Dry	37	60	2	0	104	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	2	16:14	Dry	37	60	3	0	106	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	3	16:18	Dry	36	58	1	0	106	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	3	16:18	Dry	36	58	2	0	103	110		0
17	Day	South	Centre	Solid-Dash	21/11/2018	3	16:18	Dry	36	58	3	0	101	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	1	22:49	Dry	27	0	1	0	102	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	1	22:49	Dry	27	0	2	0	101	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	1	22:49	Dry	27	0	3	0	103	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	2	22:52	Dry	27	0	1	0	97	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	2	22:52	Dry	27	0	2	0	100	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	2	22:52	Dry	27	0	3	0	101	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	3	22:55	Dry	26	0	1	0	94	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	3	22:55	Dry	26	0	2	0	93	110		0
17	Night	North	Centre	Solid-Dash	23/11/2018	3	22:55	Dry	26	0	3	0	96	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	1	22:51	Dry	28	0	1	0	99	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	1	22:51	Dry	28	0	2	0	99	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	1	22:51	Dry	28	0	3	0	98	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	2	22:54	Dry	27	0	1	0	99	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	2	22:54	Dry	27	0	2	0	98	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	2	22:54	Dry	27	0	3	0	97	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	3	22:56	Dry	27	0	1	0	99	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	3	22:56	Dry	27	0	2	0	99	110		0
17	Night	South	Centre	Dash-Solid	23/11/2018	3	22:56	Dry	27	0	3	0	98	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	1	11:29	Dry	36	112	1	0	104	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	1	11:29	Dry	36	112	2	0	102	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	1	11:29	Dry	36	112	3	0	101	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	2	11:33	Dry	37	112	1	0	101	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	2	11:33	Dry	37	112	2	0	99	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	2	11:33	Dry	37	112	3	0	104	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	3	11:35	Dry	37	112	1	0	105	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	3	11:35	Dry	37	112	2	0	104	110		0
18	Day	North	Centre	Solid-Dash	25/11/2018	3	11:35	Dry	37	112	3	0	105	110		0
18	Day	South	Centre	Dash-Solid	25/11/2018	1	11:27	Dry	36	112	1	0	107	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
18	Day	South	Centre	Dash-Solid	25/11/2018	1	11:27	Dry	36	112	2	0	106	110		0
18	Day	South	Centre	Dash-Solid	25/11/2018	1	11:27	Dry	36	112	3	0	108	110		0
18	Day	South	Centre	Dash-Solid	25/11/2018	2	11:31	Dry	37	112	1	0	104	110		0
18	Day	South	Centre	Dash-Solid	25/11/2018	2	11:31	Dry	37	112	2	0	103	110		0
18	Day	South	Centre	Dash-Solid	25/11/2018	2	11:31	Dry	37	112	3	0	104	110		0
18	Day	South	Centre	Dash-Solid	25/11/2018	3	11:34	Dry	37	113	1	0	108	110		0
18	Day	South	Centre	Dash-Solid	25/11/2018	3	11:34	Dry	37	113	2	0	107	110		0
18	Day	South	Centre	Dash-Solid	25/11/2018	3	11:34	Dry	37	113	3	0	107	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	1	0	105	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	2	0	105	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	3	0	106	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	4	0	105	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	5	0	105	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	6	0	105	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	7	0	105	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	8	0	106	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	9	0	106	110		0
19	Day	North	Centre	Double Solid	25/11/2018	1	12:31	Dry	37	112	10	0	106	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	1	0	106	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	2	0	105	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	3	0	105	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	4	0	105	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	5	0	106	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	6	0	105	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	7	0	106	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	8	0	106	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	9	0	106	110		0
19	Day	South	Centre	Double Solid	25/11/2018	1	12:27	Dry	37	112	10	0	105	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:27	Dry	41	89	1	0	106	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:32	Dry	40	83	1	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:27	Dry	41	89	2	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:32	Dry	40	83	2	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:27	Dry	41	89	3	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:32	Dry	40	83	3	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:27	Dry	41	89	4	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:32	Dry	40	83	4	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:27	Dry	41	89	5	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:32	Dry	40	83	5	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:27	Dry	41	89	6	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:32	Dry	40	83	6	0	107	110		0
20	Day	North	Centre	Dash	25/11/2018	2	14:27	Dry	41	89	7	0	107	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:25	Dry	40	90	1	0	108	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:30	Dry	40	92	1	0	102	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:30	Dry	40	92	2	0	108	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:25	Dry	40	90	2	0	107	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:25	Dry	40	90	3	0	107	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:30	Dry	40	92	3	0	104	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:25	Dry	40	90	4	0	107	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:30	Dry	40	92	4	0	105	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:25	Dry	40	90	5	0	107	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:30	Dry	40	92	5	0	104	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:25	Dry	40	90	6	0	107	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:25	Dry	40	90	7	0	107	110		0
20	Day	South	Centre	Dash	25/11/2018	1	14:25	Dry	40	90	8	0	107	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	1	0	101	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	2	0	102	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	3	0	105	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	4	0	106	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	5	0	104	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	6	0	104	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	7	0	105	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	8	0	103	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	9	0	101	110		0
20	Night	North	Centre	Dash	25/11/2018	1	20:42	Dry	32	0	10	0	100	110		0
20	Night	South	Centre	Dash	25/11/2018	1	20:40	Dry	32	0	1	0	101	110		0
20	Night	South	Centre	Dash	25/11/2018	1	20:40	Dry	32	0	2	0	102	110		0
20	Night	South	Centre	Dash	25/11/2018	1	20:40	Dry	32	0	3	0	102	110		0
20	Night	South	Centre	Dash	25/11/2018	1	20:40	Dry	32	0	4	0	102	110		0
20	Night	South	Centre	Dash	25/11/2018	1	20:40	Dry	32	0	5	0	102	110		0
20	Night	South	Centre	Dash	25/11/2018	1	20:40	Dry	32	0	6	0	103	110		0
20	Night	South	Centre	Dash	25/11/2018	1	20:40	Dry	32	0	7	0	102	110		0
20	Night	South	Centre	Dash	25/11/2018	2	20:45	Dry	32	0	1	0	101	110		0
20	Night	South	Centre	Dash	25/11/2018	2	20:45	Dry	32	0	2	0	99	110		0
20	Night	South	Centre	Dash	25/11/2018	2	20:45	Dry	32	0	3	0	99	110		0
20	Night	South	Centre	Dash	25/11/2018	2	20:45	Dry	32	0	4	0	102	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	1	0	105	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	2	0	104	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	3	0	106	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	4	0	107	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	5	0	107	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	6	0	107	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	7	0	107	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	8	0	106	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	9	0	107	110		0
21	Day	North	Centre	Double Solid	26/11/2018	1	11:26	Dry	37	112	10	0	107	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	1	0	106	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	2	0	106	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	3	0	106	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	4	0	107	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	5	0	106	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	6	0	106	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	7	0	107	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	8	0	106	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	9	0	106	110		0
21	Day	South	Centre	Double Solid	26/11/2018	1	11:22	Dry	37	112	10	0	106	110		0
22	Day	North	Centre	Double Solid	26/11/2018	1	12:12	Dry	37	112	1	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	1	12:12	Dry	37	112	2	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	1	12:12	Dry	37	112	3	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	1	12:12	Dry	37	112	4	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	1	12:12	Dry	37	112	5	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	1	12:12	Dry	37	112	6	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	2	12:15	Dry	37	112	1	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	2	12:15	Dry	37	112	2	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	2	12:15	Dry	37	112	3	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	2	12:15	Dry	37	112	4	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	2	12:15	Dry	37	112	5	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	3	12:18	Dry	37	112	1	0	105	110		0
22	Day	North	Centre	Double Solid	26/11/2018	3	12:18	Dry	37	112	2	0	105	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
22	Day	North	Centre	Double Solid	26/11/2018	3	12:18	Dry	37	112	3	0	105	110		0
22	Day	South	Centre	Double Solid	26/11/2018	1	12:10	Dry	38	113	1	0	105	110		0
22	Day	South	Centre	Double Solid	26/11/2018	1	12:10	Dry	38	113	2	0	105	110		0
22	Day	South	Centre	Double Solid	26/11/2018	1	12:10	Dry	38	113	3	0	105	110		0
22	Day	South	Centre	Double Solid	26/11/2018	2	12:13	Dry	37	112	1	0	106	110		0
22	Day	South	Centre	Double Solid	26/11/2018	2	12:13	Dry	37	112	2	0	106	110		0
22	Day	South	Centre	Double Solid	26/11/2018	2	12:13	Dry	37	112	3	0	106	110		0
22	Day	South	Centre	Double Solid	26/11/2018	2	12:13	Dry	37	112	4	0	105	110		0
22	Day	South	Centre	Double Solid	26/11/2018	3	12:16	Dry	37	112	1	0	106	110		0
22	Day	South	Centre	Double Solid	26/11/2018	3	12:16	Dry	37	112	2	0	106	110		0
22	Day	South	Centre	Double Solid	26/11/2018	3	12:16	Dry	37	112	3	0	106	110		0
22	Day	South	Centre	Double Solid	26/11/2018	3	12:16	Dry	37	112	4	0	106	110		0
22	Day	South	Centre	Double Solid	26/11/2018	3	12:16	Dry	37	112	5	0	105	110		0
22	Day	South	Centre	Double Solid	26/11/2018	3	12:16	Dry	37	112	6	0	105	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	1	0	102	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	2	0	103	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	3	0	104	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	4	0	107	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	5	0	107	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	6	0	107	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	7	0	107	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	8	0	106	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	9	0	106	110		0
23	Day	North	Centre	Dash	26/11/2018	1	13:42	Dry	39	101	10	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	1	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	2	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	3	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	4	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	5	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	6	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	7	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	8	0	106	110		0
23	Day	South	Centre	Dash	26/11/2018	1	13:38	Dry	38	103	9	0	106	110		0
23	Night	North	Centre	Dash	27/11/2018	1	20:43	Dry	27	0	1	0	95	110		0
23	Night	North	Centre	Dash	27/11/2018	1	20:43	Dry	27	0	2	0	97	110		0
23	Night	North	Centre	Dash	27/11/2018	1	20:43	Dry	27	0	3	0	98	110		0
23	Night	North	Centre	Dash	27/11/2018	1	20:43	Dry	27	0	4	0	100	110		0
23	Night	North	Centre	Dash	27/11/2018	1	20:43	Dry	27	0	5	0	100	110		0
23	Night	North	Centre	Dash	27/11/2018	1	20:43	Dry	27	0	6	0	103	110		0
23	Night	North	Centre	Dash	27/11/2018	1	20:43	Dry	27	0	7	0	104	110		0
23	Night	North	Centre	Dash	27/11/2018	2	20:48	Dry	27	0	1	0	95	110		0
23	Night	North	Centre	Dash	27/11/2018	2	20:48	Dry	27	0	2	0	100	110		0
23	Night	North	Centre	Dash	27/11/2018	2	20:48	Dry	27	0	3	0	98	110		0
23	Night	North	Centre	Dash	27/11/2018	2	20:48	Dry	27	0	4	0	100	110		0
23	Night	North	Centre	Dash	27/11/2018	2	20:48	Dry	27	0	5	0	95	110	Low beams – oncoming traffic.	0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	1	0	97	110		0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	2	0	99	110		0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	3	0	102	110		0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	4	0	101	110		0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	5	0	101	110		0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	6	0	101	110		0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	7	0	101	110		0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	8	0	101	110		0
23	Night	South	Centre	Dash	27/11/2018	1	20:46	Dry	28	0	9	0	100	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
24	Day	North	Centre	Double Solid	26/11/2018	1	14:22	Dry	39	86	1	0	104	110		0
24	Day	North	Centre	Double Solid	26/11/2018	1	14:22	Dry	39	86	2	0	103	110		0
24	Day	North	Centre	Double Solid	26/11/2018	1	14:22	Dry	39	86	3	0	99	110		0
24	Day	North	Centre	Double Solid	26/11/2018	1	14:22	Dry	39	86	4	0	98	110		0
24	Day	North	Centre	Double Solid	26/11/2018	2	14:26	Dry	38	86	1	0	103	110		0
24	Day	North	Centre	Double Solid	26/11/2018	2	14:26	Dry	38	86	2	0	102	110		0
24	Day	North	Centre	Double Solid	26/11/2018	2	14:26	Dry	38	86	3	0	98	110		0
24	Day	North	Centre	Double Solid	26/11/2018	2	14:26	Dry	38	86	4	0	102	110		0
24	Day	North	Centre	Double Solid	26/11/2018	3	14:29	Dry	39	90	1	0	106	110		0
24	Day	North	Centre	Double Solid	26/11/2018	3	14:29	Dry	39	90	2	0	103	110		0
24	Day	North	Centre	Double Solid	26/11/2018	3	14:29	Dry	39	90	3	0	102	110		0
24	Day	North	Centre	Double Solid	26/11/2018	3	14:29	Dry	39	90	4	0	102	110		0
24	Day	South	Centre	Double Solid	26/11/2018	1	14:21	Dry	39	90	1	0	103	110		0
24	Day	South	Centre	Double Solid	26/11/2018	1	14:21	Dry	39	90	2	0	104	110		0
24	Day	South	Centre	Double Solid	26/11/2018	1	14:21	Dry	39	90	3	0	105	110		0
24	Day	South	Centre	Double Solid	26/11/2018	1	14:21	Dry	39	90	4	0	106	110		0
24	Day	South	Centre	Double Solid	26/11/2018	1	14:21	Dry	39	90	5	0	105	110		0
24	Day	South	Centre	Double Solid	26/11/2018	2	14:24	Dry	38	96	1	0	105	110		0
24	Day	South	Centre	Double Solid	26/11/2018	2	14:24	Dry	38	96	2	0	104	110		0
24	Day	South	Centre	Double Solid	26/11/2018	2	14:24	Dry	38	96	3	0	103	110		0
24	Day	South	Centre	Double Solid	26/11/2018	2	14:24	Dry	38	96	4	0	103	110		0
24	Day	South	Centre	Double Solid	26/11/2018	3	14:28	Dry	39	90	1	0	104	110		0
24	Day	South	Centre	Double Solid	26/11/2018	3	14:28	Dry	39	90	2	0	103	110		0
24	Day	South	Centre	Double Solid	26/11/2018	3	14:28	Dry	39	90	3	0	103	110		0
24	Day	South	Centre	Double Solid	26/11/2018	3	14:28	Dry	39	90	4	0	106	110		0
24	Night	North	Centre	Double Solid	27/11/2018	1	21:43	Dry	25	0	1	0	99	110		0
24	Night	North	Centre	Double Solid	27/11/2018	1	21:43	Dry	25	0	2	0	97	110		0
24	Night	North	Centre	Double Solid	27/11/2018	1	21:43	Dry	25	0	3	0	96	110		0
24	Night	North	Centre	Double Solid	27/11/2018	2	21:45	Dry	26	0	1	0	98	110		0
24	Night	North	Centre	Double Solid	27/11/2018	2	21:45	Dry	26	0	2	0	94	110		0
24	Night	North	Centre	Double Solid	27/11/2018	2	21:45	Dry	26	0	3	0	92	110		0
24	Night	North	Centre	Double Solid	27/11/2018	3	21:47	Dry	25	0	1	0	98	110		0
24	Night	North	Centre	Double Solid	27/11/2018	3	21:47	Dry	25	0	2	0	96	110		0
24	Night	North	Centre	Double Solid	27/11/2018	3	21:47	Dry	25	0	3	0	95	110		0
24	Night	South	Centre	Double Solid	27/11/2018	1	21:44	Dry	26	0	1	0	95	110		0
24	Night	South	Centre	Double Solid	27/11/2018	1	21:44	Dry	26	0	2	0	95	110		0
24	Night	South	Centre	Double Solid	27/11/2018	1	21:44	Dry	26	0	3	1	94	110	Forced Error. Too small recovery distance.	
24	Night	South	Centre	Double Solid	27/11/2018	2	21:46	Dry	25	0	1	0	93	110		0
24	Night	South	Centre	Double Solid	27/11/2018	2	21:46	Dry	25	0	2	0	96	110		0
24	Night	South	Centre	Double Solid	27/11/2018	2	21:46	Dry	25	0	3	0	98	110		0
24	Night	South	Centre	Double Solid	27/11/2018	3	21:49	Dry	25	0	1	0	98	110		0
24	Night	South	Centre	Double Solid	27/11/2018	3	21:49	Dry	25	0	2	0	97	110		0
24	Night	South	Centre	Double Solid	27/11/2018	3	21:49	Dry	25	0	3	0	95	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	1	0	105	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	2	0	105	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	3	0	106	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	4	0	106	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	5	0	106	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	6	0	106	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	7	0	106	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	8	0	106	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	9	0	106	110		0
25	Day	North	Centre	Dash	26/11/2018	1	10:27	Dry	34	105	10	0	106	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	1	0	106	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	2	0	105	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	3	0	106	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	4	0	106	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	5	0	106	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	6	0	106	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	7	0	106	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	8	0	106	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	9	0	106	110		0
25	Day	South	Centre	Dash	26/11/2018	1	10:25	Dry	35	105	10	0	106	110		0

Table B.2 Warning events on marked edge lines

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
6	Day	North	Edge	Solid	20/11/2018	1	17:21	Dry	35	28	1	0	103	110		0
6	Day	North	Edge	Solid	20/11/2018	1	17:21	Dry	35	28	2	0	98	110		0
6	Day	North	Edge	Solid	20/11/2018	2	17:25	Dry	34	23	1	0	95	110		0
6	Day	North	Edge	Solid	20/11/2018	2	17:25	Dry	34	23	2	0	92	110		0
6	Day	North	Edge	Solid	20/11/2018	3	17:30	Dry	36	21	1	0	100	110		0
6	Day	North	Edge	Solid	20/11/2018	3	17:30	Dry	36	21	2	0	100	110		0
6	Day	North	Edge	Solid	20/11/2018	4	17:36	Dry	35	19	1	0	100	110		0
6	Day	North	Edge	Solid	20/11/2018	4	17:36	Dry	35	19	2	0	98	110		0
6	Day	South	Edge	Solid	20/11/2018	1	17:23	Dry/Glare	35	25	1	0	105	110		0
6	Day	South	Edge	Solid	20/11/2018	1	17:23	Dry/Glare	35	25	2	0	104	110		0
6	Day	South	Edge	Solid	20/11/2018	2	17:28	Dry/Glare	36	24	1	0	103	110		0
6	Day	South	Edge	Solid	20/11/2018	2	17:28	Dry/Glare	36	24	2	0	100	110		0
6	Day	South	Edge	Solid	20/11/2018	3	17:33	Dry/Glare	35	21	1	0	105	110		0
6	Day	South	Edge	Solid	20/11/2018	3	17:33	Dry/Glare	35	21	2	0	102	110		0
6	Day	South	Edge	Solid	20/11/2018	4	17:39	Dry/Glare	35	12	1	0	104	110		0
6	Day	South	Edge	Solid	20/11/2018	4	17:39	Dry/Glare	35	12	2	0	101	110		0
6	Night	North	Edge	Solid	23/11/2018	1	20:17	Dry	28	0	1	0	91	110		0
6	Night	North	Edge	Solid	23/11/2018	1	20:17	Dry	28	0	2	0	87	110		0
6	Night	North	Edge	Solid	23/11/2018	2	20:20	Dry	28	0	1	0	91	110		0
6	Night	North	Edge	Solid	23/11/2018	2	20:20	Dry	28	0	2	0	89	110		0
6	Night	North	Edge	Solid	23/11/2018	3	20:23	Dry	28	0	1	0	95	110		0
6	Night	North	Edge	Solid	23/11/2018	3	20:23	Dry	28	0	2	1	98	110	Forced Error. Nil recovery distance.	
6	Night	South	Edge	Solid	23/11/2018	1	20:18	Dry	28	0	1	0	92	110		0
6	Night	South	Edge	Solid	23/11/2018	1	20:18	Dry	28	0	2	1	89	110	Forced Error. Too small recovery distance.	
6	Night	South	Edge	Solid	23/11/2018	2	20:21	Dry	28	0	1	0	92	110		0
6	Night	South	Edge	Solid	23/11/2018	2	20:21	Dry	28	0	2	0	88	110		0
6	Night	South	Edge	Solid	23/11/2018	3	20:24	Dry	28	0	1	0	93	110		0
6	Night	South	Edge	Solid	23/11/2018	3	20:24	Dry	28	0	2	0	90	110		0
7	Day	North	Edge	Solid	20/11/2018	1	15:18	Dry	36	93	1	0	103	110		0
7	Day	North	Edge	Solid	20/11/2018	1	15:18	Dry	36	93	2	1	102	110	Failure (in the middle of a run).	1
7	Day	North	Edge	Solid	20/11/2018	1	15:18	Dry	36	93	3	0	99	110		0
7	Day	North	Edge	Solid	20/11/2018	2	15:23	Dry	36	78	1	0	101	110		0
7	Day	North	Edge	Solid	20/11/2018	2	15:23	Dry	36	78	2	0	102	110		0
7	Day	North	Edge	Solid	20/11/2018	2	15:23	Dry	36	78	3	0	103	110		0
7	Day	North	Edge	Solid	20/11/2018	3	15:28	Dry	36	68	1	0	99	110		0
7	Day	North	Edge	Solid	20/11/2018	3	15:28	Dry	36	68	2	0	104	110		0
7	Day	North	Edge	Solid	20/11/2018	3	15:28	Dry	36	68	3	0	104	110		0
7	Day	South	Edge	Solid	20/11/2018	1	15:20	Dry	37	92	1	0	102	110		0
7	Day	South	Edge	Solid	20/11/2018	1	15:20	Dry	37	92	2	0	100	110		0
7	Day	South	Edge	Solid	20/11/2018	1	15:20	Dry	37	92	3	0	101	110		0
7	Day	South	Edge	Solid	20/11/2018	2	15:31	Dry	36	98	1	0	102	110		0
7	Day	South	Edge	Solid	20/11/2018	2	15:31	Dry	36	98	2	0	100	110		0
7	Day	South	Edge	Solid	20/11/2018	2	15:31	Dry	36	98	3	0	102	110		0
7	Day	South	Edge	Solid	20/11/2018	3	15:26	Dry	36	99	1	0	106	110		0
7	Day	South	Edge	Solid	20/11/2018	3	15:26	Dry	36	99	2	0	104	110		0
7	Day	South	Edge	Solid	20/11/2018	3	15:26	Dry	36	99	3	0	104	110		0
7	Night	North	Edge	Solid	23/11/2018	1	21:09	Dry	28	0	1	0	91	110		0
7	Night	North	Edge	Solid	23/11/2018	1	21:09	Dry	28	0	2	0	92	110		0
7	Night	North	Edge	Solid	23/11/2018	1	21:09	Dry	28	0	3	0	91	110		0
7	Night	North	Edge	Solid	23/11/2018	1	21:09	Dry	28	0	4	0	89	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
7	Night	North	Edge	Solid	23/11/2018	2	21:13	Dry	28	0	1	0	93	110		0
7	Night	North	Edge	Solid	23/11/2018	2	21:13	Dry	28	0	2	0	90	110		0
7	Night	North	Edge	Solid	23/11/2018	2	21:13	Dry	28	0	3	0	95	110		0
7	Night	North	Edge	Solid	23/11/2018	2	21:13	Dry	28	0	4	0	98	110		0
7	Night	North	Edge	Solid	23/11/2018	3	21:15	Dry	28	0	1	0	95	110		0
7	Night	North	Edge	Solid	23/11/2018	3	21:15	Dry	28	0	2	0	94	110		0
7	Night	North	Edge	Solid	23/11/2018	3	21:15	Dry	28	0	3	0	90	110		0
7	Night	North	Edge	Solid	23/11/2018	3	21:15	Dry	28	0	4	0	92	110		0
7	Night	South	Edge	Solid	23/11/2018	1	21:07	Dry	27	0	1	0	105	110		0
7	Night	South	Edge	Solid	23/11/2018	1	21:07	Dry	27	0	2	0	105	110		0
7	Night	South	Edge	Solid	23/11/2018	1	21:07	Dry	27	0	4	0	105	110		0
7	Night	South	Edge	Solid	23/11/2018	2	21:12	Dry	27	0	1	0	89	110		0
7	Night	South	Edge	Solid	23/11/2018	2	21:12	Dry	27	0	2	0	94	110		0
7	Night	South	Edge	Solid	23/11/2018	2	21:12	Dry	27	0	3	0	95	110		0
7	Night	South	Edge	Solid	23/11/2018	2	21:12	Dry	27	0	4	0	92	110		0
7	Night	South	Edge	Solid	23/11/2018	3	21:14	Dry	28	0	1	0	92	110		0
7	Night	South	Edge	Solid	23/11/2018	3	21:14	Dry	28	0	2	0	93	110		0
7	Night	South	Edge	Solid	23/11/2018	3	21:14	Dry	28	0	3	0	94	110		0
7	Night	South	Edge	Solid	23/11/2018	3	21:14	Dry	28	0	4	0	92	110		0
8	Day	North	Edge	Solid	21/11/2018	1	17:37	Dry	35	20	1	0	106	110		0
8	Day	North	Edge	Solid	21/11/2018	1	17:37	Dry	35	20	2	0	108	110		0
8	Day	North	Edge	Solid	21/11/2018	1	17:37	Dry	35	20	3	0	109	110		0
8	Day	North	Edge	Solid	21/11/2018	1	17:37	Dry	35	20	4	0	108	110		0
8	Day	North	Edge	Solid	21/11/2018	2	17:41	Dry	36	17	1	0	104	110		0
8	Day	North	Edge	Solid	21/11/2018	2	17:41	Dry	36	17	2	0	104	110		0
8	Day	North	Edge	Solid	21/11/2018	2	17:41	Dry	36	17	3	0	105	110		0
8	Day	North	Edge	Solid	21/11/2018	2	17:41	Dry	36	17	4	0	107	110		0
8	Day	North	Edge	Solid	21/11/2018	3	17:45	Dry	35	14	1	0	101	110		0
8	Day	North	Edge	Solid	21/11/2018	3	17:45	Dry	35	14	2	0	100	110		0
8	Day	North	Edge	Solid	21/11/2018	3	17:45	Dry	35	14	3	0	103	110		0
8	Day	North	Edge	Solid	21/11/2018	3	17:45	Dry	35	14	4	0	103	110		0
8	Day	South	Edge	Solid	21/11/2018	1	17:39	Dry/Glare	36	18	1	0	96	110		0
8	Day	South	Edge	Solid	21/11/2018	1	17:39	Dry/Glare	36	18	2	0	105	110		0
8	Day	South	Edge	Solid	21/11/2018	1	17:39	Dry/Glare	36	18	3	0	104	110		0
8	Day	South	Edge	Solid	21/11/2018	1	17:39	Dry/Glare	36	18	4	1	104	110	Forced Error. Too small recovery distance.	
8	Day	South	Edge	Solid	21/11/2018	2	17:43	Dry/Glare	36	18	1	0	101	110		0
8	Day	South	Edge	Solid	21/11/2018	2	17:43	Dry/Glare	36	18	2	0	104	110		0
8	Day	South	Edge	Solid	21/11/2018	2	17:43	Dry/Glare	36	18	3	0	106	110		0
8	Day	South	Edge	Solid	21/11/2018	2	17:43	Dry/Glare	36	18	4	0	106	110		0
8	Day	South	Edge	Solid	21/11/2018	3	17:48	Dry/Glare	35	12	1	0	102	110		0
8	Day	South	Edge	Solid	21/11/2018	3	17:48	Dry/Glare	35	12	2	0	103	110		0
8	Day	South	Edge	Solid	21/11/2018	3	17:48	Dry/Glare	35	12	3	0	105	110		0
8	Day	South	Edge	Solid	21/11/2018	3	17:48	Dry/Glare	35	12	4	0	103	110		0
8	Night	North	Edge	Solid	23/11/2018	1	22:03	Dry	27	0	1	0	95	110		0
8	Night	North	Edge	Solid	23/11/2018	1	22:03	Dry	27	0	2	0	98	110		0
8	Night	North	Edge	Solid	23/11/2018	1	22:03	Dry	27	0	3	0	99	110		0
8	Night	North	Edge	Solid	23/11/2018	1	22:03	Dry	27	0	4	0	100	110		0
8	Night	North	Edge	Solid	23/11/2018	1	22:03	Dry	27	0	5	0	100	110		0
8	Night	North	Edge	Solid	23/11/2018	2	22:06	Dry	27	0	1	0	97	110		0
8	Night	North	Edge	Solid	23/11/2018	2	22:06	Dry	27	0	2	0	108	110		0
8	Night	North	Edge	Solid	23/11/2018	2	22:06	Dry	27	0	3	0	103	110		0
8	Night	North	Edge	Solid	23/11/2018	2	22:06	Dry	27	0	4	0	102	110		0
8	Night	North	Edge	Solid	23/11/2018	2	22:06	Dry	27	0	5	0	99	110		0
8	Night	South	Edge	Solid	23/11/2018	1	22:01	Dry	27	0	1	0	94	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
8	Night	South	Edge	Solid	23/11/2018	1	22:01	Dry	27	0	2	0	96	110		0
8	Night	South	Edge	Solid	23/11/2018	1	22:01	Dry	27	0	3	0	98	110		0
8	Night	South	Edge	Solid	23/11/2018	1	22:01	Dry	27	0	4	0	101	110		0
8	Night	South	Edge	Solid	23/11/2018	1	22:01	Dry	27	0	5	0	102	110		0
8	Night	South	Edge	Solid	23/11/2018	2	22:05	Dry	27	0	1	0	94	110		0
8	Night	South	Edge	Solid	23/11/2018	2	22:05	Dry	27	0	2	0	97	110		0
8	Night	South	Edge	Solid	23/11/2018	2	22:05	Dry	27	0	3	0	98	110		0
8	Night	South	Edge	Solid	23/11/2018	2	22:05	Dry	27	0	4	0	100	110		0
8	Night	South	Edge	Solid	23/11/2018	2	22:05	Dry	27	0	5	0	103	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	1	17:22	Dry	38	24	1	0	94	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	1	17:22	Dry	38	24	2	1	100	110	Forced Error. Too small recovery distance.	
9	Day	North	Edge	Solid Tactile	22/11/2018	1	17:22	Dry	38	24	3	0	102	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	1	17:22	Dry	38	24	4	0	99	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	2	17:27	Dry	37	28	1	0	104	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	2	17:27	Dry	37	28	2	0	105	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	2	17:27	Dry	37	28	3	0	108	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	2	17:27	Dry	37	28	4	0	106	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	3	17:30	Dry	38	21	1	0	103	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	3	17:30	Dry	38	21	2	0	102	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	3	17:30	Dry	38	21	3	0	102	110		0
9	Day	North	Edge	Solid Tactile	22/11/2018	3	17:30	Dry	38	21	4	0	102	110		0
9	Day	South	Edge	Solid Tactile	22/11/2018	1	17:19	Dry	38	24	1	0	105	110		0
9	Day	South	Edge	Solid Tactile	22/11/2018	1	17:19	Dry	38	24	2	1	105	110	Questionable Error. New line formation error.	
9	Day	South	Edge	Solid Tactile	22/11/2018	1	17:19	Dry	38	24	3	0	105	110		0
9	Day	South	Edge	Solid Tactile	22/11/2018	1	17:19	Dry	38	24	4	0	107	110		0
9	Day	South	Edge	Solid Tactile	22/11/2018	2	17:24	Dry	38	20	1	1	100	110	Failure. Line split error.	
9	Day	South	Edge	Solid Tactile	22/11/2018	2	17:24	Dry	38	20	2	0	99	110		0
9	Day	South	Edge	Solid Tactile	22/11/2018	2	17:24	Dry	38	20	3	0	103	110		0
9	Day	South	Edge	Solid Tactile	22/11/2018	2	17:24	Dry	38	20	4	1	107	110	Forced Error. Too small recovery distance.	
9	Day	South	Edge	Solid Tactile	22/11/2018	3	17:28	Dry	38	24	1	1	91	110	Failure. Line split error.	
9	Day	South	Edge	Solid Tactile	22/11/2018	3	17:28	Dry	38	24	2	0	97	110	Interesting - late warning.	0
9	Day	South	Edge	Solid Tactile	22/11/2018	3	17:28	Dry	38	24	3	0	100	110		0
9	Day	South	Edge	Solid Tactile	22/11/2018	3	17:28	Dry	38	24	4	0	99	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	1	22:39	Dry	29	0	1	0	96	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	1	22:39	Dry	29	0	2	0	92	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	1	22:39	Dry	29	0	3	0	98	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	1	22:39	Dry	29	0	4	0	97	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	1	22:39	Dry	29	0	5	0	96	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	2	22:44	Dry	29	0	1	0	98	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	2	22:44	Dry	29	0	2	0	98	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	2	22:44	Dry	29	0	3	0	102	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	2	22:44	Dry	29	0	4	0	98	110		0
9	Night	North	Edge	Solid Tactile	22/11/2018	2	22:44	Dry	29	0	5	0	96	110		0
9	Night	South	Edge	Solid Tactile	22/11/2018	1	22:38	Dry	29	0	1	0	97	110		0
9	Night	South	Edge	Solid Tactile	22/11/2018	1	22:38	Dry	29	0	2	0	99	110		0
9	Night	South	Edge	Solid Tactile	22/11/2018	1	22:38	Dry	29	0	3	1	98	110	Questionable Error. New line formation error.	
9	Night	South	Edge	Solid Tactile	22/11/2018	1	22:38	Dry	29	0	4	0	101	110		0
9	Night	South	Edge	Solid Tactile	22/11/2018	1	22:38	Dry	29	0	5	0	100	110		0
9	Night	South	Edge	Solid Tactile	22/11/2018	2	22:41	Dry	29	0	1	0	105	110		0
9	Night	South	Edge	Solid Tactile	22/11/2018	2	22:41	Dry	29	0	2	0	101	110		0
9	Night	South	Edge	Solid Tactile	22/11/2018	2	22:41	Dry	29	0	3	0	102	110		0
9	Night	South	Edge	Solid Tactile	22/11/2018	2	22:41	Dry	29	0	4	1	100	110	Questionable Error. New line formation error.	
9	Night	South	Edge	Solid Tactile	22/11/2018	2	22:41	Dry	29	0	5	0	102	110		0
10	Day	North	Edge	Solid Tactile	22/11/2018	1	15:54	Dry	41	60	1	0	62	70		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
10	Day	North	Edge	Solid Tactile	22/11/2018	1	15:54	Dry	41	60	2	0	64	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	1	15:54	Dry	41	60	3	0	65	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	1	15:54	Dry	41	60	4	0	64	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	2	16:00	Dry	40	61	1	0	60	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	2	16:00	Dry	40	61	2	0	61	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	2	16:00	Dry	40	61	3	0	64	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	2	16:00	Dry	40	61	4	0	64	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	3	16:04	Dry	40	60	1	0	63	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	3	16:04	Dry	40	60	2	1	65	70	Forced Error. Too small recovery distance.	
10	Day	North	Edge	Solid Tactile	22/11/2018	3	16:04	Dry	40	60	3	0	65	70		0
10	Day	North	Edge	Solid Tactile	22/11/2018	3	16:04	Dry	40	60	4	0	64	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	1	15:53	Dry	41	70	1	0	66	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	1	15:53	Dry	41	70	2	0	69	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	1	15:53	Dry	41	70	3	0	70	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	1	15:53	Dry	41	70	4	0	68	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	2	15:57	Dry	40	65	1	0	66	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	2	15:57	Dry	40	65	2	0	69	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	2	15:57	Dry	40	65	3	0	65	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	2	15:57	Dry	40	65	4	0	64	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	3	16:02	Dry	39	60	1	0	68	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	3	16:02	Dry	39	60	2	0	69	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	3	16:02	Dry	39	60	3	0	66	70		0
10	Day	South	Edge	Solid Tactile	22/11/2018	3	16:02	Dry	39	60	4	0	64	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	1	21:59	Dry	30	0	1	0	65	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	1	21:59	Dry	30	0	2	0	66	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	1	21:59	Dry	30	0	3	0	66	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	1	21:59	Dry	30	0	4	0	66	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	1	21:59	Dry	30	0	5	0	66	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	2	22:04	Dry	30	0	1	0	67	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	2	22:04	Dry	30	0	2	0	66	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	2	22:04	Dry	30	0	3	0	66	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	2	22:04	Dry	30	0	4	0	66	70		0
10	Night	North	Edge	Solid Tactile	22/11/2018	2	22:04	Dry	30	0	5	0	66	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	1	21:58	Dry	30	0	1	0	66	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	1	21:58	Dry	30	0	2	0	66	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	1	21:58	Dry	30	0	3	0	66	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	1	21:58	Dry	30	0	4	1	66	70	Forced Error. Too small recovery distance.	
10	Night	South	Edge	Solid Tactile	22/11/2018	1	21:58	Dry	30	0	5	0	66	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	2	22:03	Dry	30	0	1	0	65	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	2	22:03	Dry	30	0	2	0	67	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	2	22:03	Dry	30	0	3	0	66	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	2	22:03	Dry	30	0	4	0	66	70		0
10	Night	South	Edge	Solid Tactile	22/11/2018	2	22:03	Dry	30	0	5	0	66	70		0
12	Day	North	Edge	Solid	22/11/2018	1	18:27	Dry	36	1.1	1	0	66	70		0
12	Day	North	Edge	Solid	22/11/2018	1	18:27	Dry	36	1.1	2	0	65	70		0
12	Day	North	Edge	Solid	22/11/2018	1	18:27	Dry	36	1.1	3	0	65	70		0
12	Day	North	Edge	Solid	22/11/2018	1	18:27	Dry	36	1.1	4	0	65	70		0
12	Day	North	Edge	Solid	22/11/2018	2	18:28	Dry	36	0.7	1	0	66	70		0
12	Day	North	Edge	Solid	22/11/2018	2	18:28	Dry	36	0.7	2	0	66	70		0
12	Day	North	Edge	Solid	22/11/2018	2	18:28	Dry	36	0.7	3	0	67	70		0
12	Day	North	Edge	Solid	22/11/2018	3	18:32	Dry	36	0.7	1	0	61	70		0
12	Day	North	Edge	Solid	22/11/2018	3	18:32	Dry	36	0.7	2	0	63	70		0
12	Day	North	Edge	Solid	22/11/2018	3	18:32	Dry	36	0.7	3	0	65	70		0
12	Day	North	Edge	Solid	22/11/2018	3	18:32	Dry	36	0.7	4	0	65	70		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
12	Day	South	Edge	Solid	22/11/2018	1	18:28	Dry	36	1	1	0	66	70		0
12	Day	South	Edge	Solid	22/11/2018	1	18:28	Dry	36	1	2	0	65	70		0
12	Day	South	Edge	Solid	22/11/2018	1	18:28	Dry	36	1	3	0	66	70		0
12	Day	South	Edge	Solid	22/11/2018	1	18:28	Dry	36	1	4	0	67	70		0
12	Day	South	Edge	Solid	22/11/2018	2	18:31	Dry	36	0.7	1	0	64	70		0
12	Day	South	Edge	Solid	22/11/2018	2	18:31	Dry	36	0.7	2	0	64	70		0
12	Day	South	Edge	Solid	22/11/2018	2	18:31	Dry	36	0.7	3	0	64	70		0
12	Day	South	Edge	Solid	22/11/2018	2	18:31	Dry	36	0.7	4	0	65	70		0
12	Day	South	Edge	Solid	22/11/2018	3	18:33	Dry	36	0.7	1	0	64	70	False positive just after this one.	0
12	Day	South	Edge	Solid	22/11/2018	3	18:33	Dry	36	0.7	2	0	65	70		0
12	Day	South	Edge	Solid	22/11/2018	3	18:33	Dry	36	0.7	3	0	67	70		0
12	Day	South	Edge	Solid	22/11/2018	3	18:33	Dry	36	0.7	4	1	66	70	Failure (in the middle of a run).	1
12	Night	North	Edge	Solid	22/11/2018	1	21:34	Dry	31	0	1	0	61	70		0
12	Night	North	Edge	Solid	22/11/2018	1	21:34	Dry	31	0	2	0	61	70		0
12	Night	North	Edge	Solid	22/11/2018	1	21:34	Dry	31	0	3	0	61	70		0
12	Night	North	Edge	Solid	22/11/2018	1	21:34	Dry	31	0	4	0	62	70		0
12	Night	North	Edge	Solid	22/11/2018	1	21:34	Dry	31	0	5	0	63	70		0
12	Night	North	Edge	Solid	22/11/2018	2	21:38	Dry	31	0	1	0	65	70		0
12	Night	North	Edge	Solid	22/11/2018	2	21:38	Dry	31	0	2	0	68	70		0
12	Night	North	Edge	Solid	22/11/2018	2	21:38	Dry	31	0	3	0	66	70		0
12	Night	North	Edge	Solid	22/11/2018	2	21:38	Dry	31	0	4	0	64	70		0
12	Night	North	Edge	Solid	22/11/2018	2	21:38	Dry	31	0	5	0	63	70		0
12	Night	South	Edge	Solid	22/11/2018	1	21:36	Dry	32	0	1	0	62	70		0
12	Night	South	Edge	Solid	22/11/2018	1	21:36	Dry	32	0	2	0	64	70		0
12	Night	South	Edge	Solid	22/11/2018	1	21:36	Dry	32	0	3	0	67	70		0
12	Night	South	Edge	Solid	22/11/2018	1	21:36	Dry	32	0	4	0	64	70		0
12	Night	South	Edge	Solid	22/11/2018	1	21:36	Dry	32	0	5	0	64	70		0
12	Night	South	Edge	Solid	22/11/2018	2	21:39	Dry	31	0	1	0	66	70		0
12	Night	South	Edge	Solid	22/11/2018	2	21:39	Dry	31	0	2	0	65	70		0
12	Night	South	Edge	Solid	22/11/2018	2	21:39	Dry	31	0	3	0	65	70		0
12	Night	South	Edge	Solid	22/11/2018	2	21:39	Dry	31	0	4	0	67	70		0
12	Night	South	Edge	Solid	22/11/2018	2	21:39	Dry	31	0	5	0	67	70		0
13	Day	North	Edge	Solid	21/11/2018	1	11:13	Dry	34	125	1	0	84	90		0
13	Day	North	Edge	Solid	21/11/2018	1	11:13	Dry	34	125	2	0	83	90		0
13	Day	North	Edge	Solid	21/11/2018	1	11:13	Dry	34	125	3	0	88	100		0
13	Day	North	Edge	Solid	21/11/2018	2	11:18	Dry	33	125	1	0	87	90		0
13	Day	North	Edge	Solid	21/11/2018	2	11:18	Dry	33	125	2	0	88	90		0
13	Day	North	Edge	Solid	21/11/2018	2	11:18	Dry	33	125	3	0	88	100		0
13	Day	North	Edge	Solid	21/11/2018	3	11:22	Dry	34	127	1	0	82	90		0
13	Day	North	Edge	Solid	21/11/2018	3	11:22	Dry	34	127	2	0	83	90		0
13	Day	North	Edge	Solid	21/11/2018	3	11:22	Dry	34	127	3	0	92	100		0
13	Day	South	Edge	Solid	21/11/2018	1	11:12	Dry	34	126	1	0	87	100		0
13	Day	South	Edge	Solid	21/11/2018	1	11:12	Dry	34	126	2	0	88	100		0
13	Day	South	Edge	Solid	21/11/2018	1	11:12	Dry	34	126	3	0	86	90		0
13	Day	South	Edge	Solid	21/11/2018	2	11:16	Dry	34	127	1	0	92	100		0
13	Day	South	Edge	Solid	21/11/2018	2	11:16	Dry	34	127	2	0	89	100		0
13	Day	South	Edge	Solid	21/11/2018	2	11:16	Dry	34	127	3	0	85	90	Over tyre marks.	0
13	Day	South	Edge	Solid	21/11/2018	3	11:21	Dry	33	127	1	0	95	100		0
13	Day	South	Edge	Solid	21/11/2018	3	11:21	Dry	33	127	2	0	90	90		0
13	Day	South	Edge	Solid	21/11/2018	3	11:21	Dry	33	127	3	0	80	90		0
13	Night	North	Edge	Solid	22/11/2018	1	20:45	Dry	34	0	1	0	82	90		0
13	Night	North	Edge	Solid	22/11/2018	1	20:45	Dry	34	0	2	0	84	90		0
13	Night	North	Edge	Solid	22/11/2018	1	20:45	Dry	34	0	3	0	83	90		0
13	Night	North	Edge	Solid	22/11/2018	1	20:45	Dry	34	0	4	0	84	90		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
13	Night	North	Edge	Solid	22/11/2018	1	20:45	Dry	34	0	5	0	85	90		0
13	Night	North	Edge	Solid	22/11/2018	2	20:48	Dry	32	0	1	0	81	90		0
13	Night	North	Edge	Solid	22/11/2018	2	20:48	Dry	32	0	2	0	83	90		0
13	Night	North	Edge	Solid	22/11/2018	2	20:48	Dry	32	0	3	0	84	90		0
13	Night	North	Edge	Solid	22/11/2018	2	20:48	Dry	32	0	4	0	86	90		0
13	Night	North	Edge	Solid	22/11/2018	2	20:48	Dry	32	0	5	0	85	90		0
13	Night	South	Edge	Solid	22/11/2018	1	20:47	Dry	33	0	1	0	82	90		0
13	Night	South	Edge	Solid	22/11/2018	1	20:47	Dry	33	0	2	0	83	90		0
13	Night	South	Edge	Solid	22/11/2018	1	20:47	Dry	33	0	3	0	86	90		0
13	Night	South	Edge	Solid	22/11/2018	1	20:47	Dry	33	0	4	0	86	90		0
13	Night	South	Edge	Solid	22/11/2018	1	20:47	Dry	33	0	5	0	85	90		0
13	Night	South	Edge	Solid	22/11/2018	2	20:50	Dry	32	0	1	0	82	90		0
13	Night	South	Edge	Solid	22/11/2018	2	20:50	Dry	32	0	2	0	84	90		0
13	Night	South	Edge	Solid	22/11/2018	2	20:50	Dry	32	0	3	0	90	90		0
13	Night	South	Edge	Solid	22/11/2018	2	20:50	Dry	32	0	4	0	89	90		0
13	Night	South	Edge	Solid	22/11/2018	2	20:50	Dry	32	0	5	0	87	90		0
14	Day	North	Edge	Solid	21/11/2018	1	12:08	Dry	35	130	1	0	97	110		0
14	Day	North	Edge	Solid	21/11/2018	1	12:08	Dry	35	130	2	0	98	110		0
14	Day	North	Edge	Solid	21/11/2018	1	12:08	Dry	35	130	3	0	98	110		0
14	Day	North	Edge	Solid	21/11/2018	2	12:13	Dry	35	130	1	0	99	110		0
14	Day	North	Edge	Solid	21/11/2018	2	12:13	Dry	35	130	2	0	100	110		0
14	Day	North	Edge	Solid	21/11/2018	2	12:13	Dry	35	130	3	0	102	110		0
14	Day	North	Edge	Solid	21/11/2018	3	12:17	Dry	35	130	1	0	101	110		0
14	Day	North	Edge	Solid	21/11/2018	3	12:17	Dry	35	130	2	0	102	110		0
14	Day	North	Edge	Solid	21/11/2018	3	12:17	Dry	35	130	3	0	102	110		0
14	Day	South	Edge	Solid	21/11/2018	1	12:06	Dry	34	130	1	0	94	110		0
14	Day	South	Edge	Solid	21/11/2018	1	12:06	Dry	34	130	2	0	95	110		0
14	Day	South	Edge	Solid	21/11/2018	1	12:06	Dry	34	130	3	0	97	110		0
14	Day	South	Edge	Solid	21/11/2018	2	12:10	Dry	35	125	1	0	102	110		0
14	Day	South	Edge	Solid	21/11/2018	2	12:10	Dry	35	125	2	0	100	110		0
14	Day	South	Edge	Solid	21/11/2018	2	12:10	Dry	35	125	3	0	100	110		0
14	Day	South	Edge	Solid	21/11/2018	3	12:14	Dry	34	128	1	0	100	110		0
14	Day	South	Edge	Solid	21/11/2018	3	12:14	Dry	34	128	2	0	100	110		0
14	Day	South	Edge	Solid	21/11/2018	3	12:14	Dry	34	128	3	0	102	110		0
14	Night	North	Edge	Solid	22/11/2018	1	20:21	Dry	33	0	1	0	97	110		0
14	Night	North	Edge	Solid	22/11/2018	1	20:21	Dry	33	0	2	0	96	110		0
14	Night	North	Edge	Solid	22/11/2018	1	20:21	Dry	33	0	3	0	97	110		0
14	Night	North	Edge	Solid	22/11/2018	1	20:21	Dry	33	0	4	0	96	110		0
14	Night	North	Edge	Solid	22/11/2018	2	20:24	Dry	33	0	1	0	92	110		0
14	Night	North	Edge	Solid	22/11/2018	2	20:24	Dry	33	0	2	0	96	110		0
14	Night	North	Edge	Solid	22/11/2018	2	20:24	Dry	33	0	3	0	96	110		0
14	Night	North	Edge	Solid	22/11/2018	2	20:24	Dry	33	0	4	0	98	110		0
14	Night	North	Edge	Solid	22/11/2018	3	20:27	Dry	32	0	1	0	98	110		0
14	Night	North	Edge	Solid	22/11/2018	3	20:27	Dry	32	0	2	0	100	110		0
14	Night	North	Edge	Solid	22/11/2018	3	20:27	Dry	32	0	3	0	102	110		0
14	Night	North	Edge	Solid	22/11/2018	3	20:27	Dry	32	0	4	0	101	110		0
14	Night	South	Edge	Solid	22/11/2018	1	20:22	Dry	33	0	1	0	95	110		0
14	Night	South	Edge	Solid	22/11/2018	1	20:22	Dry	33	0	2	0	96	110		0
14	Night	South	Edge	Solid	22/11/2018	1	20:22	Dry	33	0	3	0	95	110		0
14	Night	South	Edge	Solid	22/11/2018	1	20:22	Dry	33	0	4	0	91	110		0
14	Night	South	Edge	Solid	22/11/2018	2	20:26	Dry	33	0	1	0	93	110		0
14	Night	South	Edge	Solid	22/11/2018	2	20:26	Dry	33	0	2	0	92	110		0
14	Night	South	Edge	Solid	22/11/2018	2	20:26	Dry	33	0	3	0	94	110		0
14	Night	South	Edge	Solid	22/11/2018	2	20:26	Dry	33	0	4	0	95	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
14	Night	South	Edge	Solid	22/11/2018	3	20:29	Dry	32	0	1	0	94	110		0
14	Night	South	Edge	Solid	22/11/2018	3	20:29	Dry	32	0	2	0	93	110		0
14	Night	South	Edge	Solid	22/11/2018	3	20:29	Dry	32	0	3	0	94	110		0
14	Night	South	Edge	Solid	22/11/2018	3	20:29	Dry	32	0	4	0	94	110		0
15	Day	North	Edge	Solid	21/11/2018	1	13:39	Dry	36	115	1	0	96	110		0
15	Day	North	Edge	Solid	21/11/2018	1	13:39	Dry	36	115	2	0	98	110		0
15	Day	North	Edge	Solid	21/11/2018	1	13:39	Dry	36	115	3	0	100	110		0
15	Day	North	Edge	Solid	21/11/2018	2	13:43	Dry	36	115	1	0	103	110		0
15	Day	North	Edge	Solid	21/11/2018	2	13:43	Dry	36	115	2	0	102	110		0
15	Day	North	Edge	Solid	21/11/2018	2	13:43	Dry	36	115	3	0	102	110		0
15	Day	North	Edge	Solid	21/11/2018	3	13:47	Dry	36	114	1	0	100	110		0
15	Day	North	Edge	Solid	21/11/2018	3	13:47	Dry	36	114	2	0	95	110		0
15	Day	North	Edge	Solid	21/11/2018	3	13:47	Dry	36	114	3	0	99	110		0
15	Day	South	Edge	Solid	21/11/2018	1	13:37	Dry	35	115	1	0	100	110		0
15	Day	South	Edge	Solid	21/11/2018	1	13:37	Dry	35	115	2	0	98	110		0
15	Day	South	Edge	Solid	21/11/2018	1	13:37	Dry	35	115	3	0	98	110		0
15	Day	South	Edge	Solid	21/11/2018	2	13:40	Dry	35	112	1	0	101	110		0
15	Day	South	Edge	Solid	21/11/2018	2	13:40	Dry	35	112	2	0	100	110		0
15	Day	South	Edge	Solid	21/11/2018	2	13:40	Dry	35	112	3	0	99	110		0
15	Day	South	Edge	Solid	21/11/2018	3	13:44	Dry	35	112	1	0	104	110		0
15	Day	South	Edge	Solid	21/11/2018	3	13:44	Dry	35	112	2	0	103	110		0
15	Day	South	Edge	Solid	21/11/2018	3	13:44	Dry	35	112	3	0	101	110		0
15	Night	North	Edge	Solid	23/11/2018	1	23:52	Dry	27	0	1	0	96	110		0
15	Night	North	Edge	Solid	23/11/2018	1	23:52	Dry	27	0	2	0	98	110		0
15	Night	North	Edge	Solid	23/11/2018	1	23:52	Dry	27	0	3	0	97	110		0
15	Night	North	Edge	Solid	23/11/2018	1	23:52	Dry	27	0	4	0	92	110		0
15	Night	North	Edge	Solid	23/11/2018	1	23:52	Dry	27	0	5	0	94	110		0
15	Night	North	Edge	Solid	23/11/2018	2	23:55	Dry	26	0	1	0	98	110		0
15	Night	North	Edge	Solid	23/11/2018	2	23:55	Dry	26	0	2	0	97	110		0
15	Night	North	Edge	Solid	23/11/2018	2	23:55	Dry	26	0	3	1	94	110	Forced Error. Too small recovery distance.	
15	Night	North	Edge	Solid	23/11/2018	2	23:55	Dry	26	0	4	0	90	110		0
15	Night	North	Edge	Solid	23/11/2018	2	23:55	Dry	26	0	5	0	93	110		0
15	Night	South	Edge	Solid	23/11/2018	1	23:50	Dry	27	0	1	0	98	110		0
15	Night	South	Edge	Solid	23/11/2018	1	23:50	Dry	27	0	2	0	102	110		0
15	Night	South	Edge	Solid	23/11/2018	1	23:50	Dry	27	0	3	0	100	110		0
15	Night	South	Edge	Solid	23/11/2018	1	23:50	Dry	27	0	4	0	101	110		0
15	Night	South	Edge	Solid	23/11/2018	1	23:50	Dry	27	0	5	0	102	110		0
15	Night	South	Edge	Solid	23/11/2018	2	23:54	Dry	26	0	1	0	97	110		0
15	Night	South	Edge	Solid	23/11/2018	2	23:54	Dry	26	0	2	0	96	110		0
15	Night	South	Edge	Solid	23/11/2018	2	23:54	Dry	26	0	3	0	97	110		0
15	Night	South	Edge	Solid	23/11/2018	2	23:54	Dry	26	0	4	0	101	110		0
15	Night	South	Edge	Solid	23/11/2018	2	23:54	Dry	26	0	5	0	102	110		0
16	Day	North	Edge	Solid with Dash	21/11/2018	1	15:33	Dry	37	80	1	0	92	110		0
16	Day	North	Edge	Solid with Dash	21/11/2018	1	15:33	Dry	37	80	2	0	92	110		0
16	Day	North	Edge	Solid with Dash	21/11/2018	2	15:37	Dry	37	78	1	0	95	110		0
16	Day	North	Edge	Solid with Dash	21/11/2018	2	15:37	Dry	37	78	2	0	96	110		0
16	Day	North	Edge	Solid with Dash	21/11/2018	3	15:42	Dry	36	75	1	0	95	110		0
16	Day	North	Edge	Solid with Dash	21/11/2018	3	15:42	Dry	36	75	2	0	94	110		0
16	Day	South	Edge	Solid	21/11/2018	1	15:32	Dry	36	78	1	0	98	110		0
16	Day	South	Edge	Solid	21/11/2018	1	15:32	Dry	36	78	2	0	100	110		0
16	Day	South	Edge	Solid	21/11/2018	1	15:32	Dry	36	78	3	0	101	110		0
16	Day	South	Edge	Solid	21/11/2018	2	15:36	Dry	37	70	1	0	101	110		0
16	Day	South	Edge	Solid	21/11/2018	2	15:36	Dry	37	70	2	0	106	110		0
16	Day	South	Edge	Solid	21/11/2018	2	15:36	Dry	37	70	3	0	104	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
16	Day	South	Edge	Solid	21/11/2018	3	15:40	Dry	36	70	1	0	98	110		0
16	Day	South	Edge	Solid	21/11/2018	3	15:40	Dry	36	70	2	0	101	110		0
16	Day	South	Edge	Solid	21/11/2018	3	15:40	Dry	36	70	3	0	102	110		0
16	Night	North	Edge	Solid with Dash	23/11/2018	1	23:15	Dry	26	0	1	0	90	110		0
16	Night	North	Edge	Solid with Dash	23/11/2018	1	23:15	Dry	26	0	2	0	90	110		0
16	Night	North	Edge	Solid with Dash	23/11/2018	2	23:17	Dry	27	0	1	0	93	110		0
16	Night	North	Edge	Solid with Dash	23/11/2018	2	23:17	Dry	27	0	2	0	92	110		0
16	Night	North	Edge	Solid with Dash	23/11/2018	3	23:20	Dry	26	0	1	0	97	110		0
16	Night	North	Edge	Solid with Dash	23/11/2018	3	23:20	Dry	26	0	2	0	100	110		0
16	Night	South	Edge	Solid	23/11/2018	1	23:16	Dry	27	0	1	0	99	110		0
16	Night	South	Edge	Solid	23/11/2018	1	23:16	Dry	27	0	2	0	97	110		0
16	Night	South	Edge	Solid	23/11/2018	1	23:16	Dry	27	0	3	0	98	110		0
16	Night	South	Edge	Solid	23/11/2018	2	23:18	Dry	26	0	1	0	97	110		0
16	Night	South	Edge	Solid	23/11/2018	2	23:18	Dry	26	0	2	0	94	110		0
16	Night	South	Edge	Solid	23/11/2018	2	23:18	Dry	26	0	3	0	95	110		0
16	Night	South	Edge	Solid	23/11/2018	3	23:22	Dry	26	0	1	0	98	110		0
16	Night	South	Edge	Solid	23/11/2018	3	23:22	Dry	26	0	2	0	97	110		0
16	Night	South	Edge	Solid	23/11/2018	3	23:22	Dry	26	0	3	0	96	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	1	16:28	Dry	37	52	1	0	96	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	1	16:28	Dry	37	52	2	0	103	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	1	16:28	Dry	37	52	3	0	106	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	2	16:32	Dry	36	45	1	0	102	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	2	16:32	Dry	36	45	2	0	102	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	2	16:32	Dry	36	45	3	0	103	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	3	16:38	Dry	36	50	1	0	107	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	3	16:38	Dry	36	50	2	0	107	110		0
17	Day	North	Edge	Solid Tactile	21/11/2018	3	16:38	Dry	36	50	3	0	106	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	1	16:25	Dry	36	50	1	0	104	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	1	16:25	Dry	36	50	2	0	107	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	1	16:25	Dry	36	50	3	0	107	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	2	16:30	Dry	37	47	1	0	107	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	2	16:30	Dry	37	47	2	0	105	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	2	16:30	Dry	37	47	3	0	106	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	3	16:34	Dry	36	48	1	0	108	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	3	16:34	Dry	36	48	2	0	106	110		0
17	Day	South	Edge	Solid Tactile	21/11/2018	3	16:34	Dry	36	48	3	0	107	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	1	22:38	Dry	27	0	1	0	99	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	1	22:38	Dry	27	0	2	0	101	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	1	22:38	Dry	27	0	3	0	102	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	1	22:38	Dry	27	0	4	0	102	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	1	22:38	Dry	27	0	5	0	103	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	2	22:40	Dry	27	0	1	0	98	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	2	22:40	Dry	27	0	2	0	100	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	2	22:40	Dry	27	0	3	0	105	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	2	22:40	Dry	27	0	4	0	104	110		0
17	Night	North	Edge	Solid Tactile	23/11/2018	2	22:40	Dry	27	0	5	0	104	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	1	22:35	Dry	27	0	1	0	87	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	1	22:35	Dry	27	0	2	0	94	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	1	22:35	Dry	27	0	3	0	99	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	1	22:35	Dry	27	0	4	0	101	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	1	22:35	Dry	27	0	5	0	100	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	2	22:39	Dry	27	0	1	0	98	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	2	22:39	Dry	27	0	2	0	99	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	2	22:39	Dry	27	0	3	0	101	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
17	Night	South	Edge	Solid Tactile	23/11/2018	2	22:39	Dry	27	0	4	0	103	110		0
17	Night	South	Edge	Solid Tactile	23/11/2018	2	22:39	Dry	27	0	5	0	104	110		0
19	Day	North	Edge	Solid	25/11/2018	1	12:38	Dry	38	112	1	0	103	110		0
19	Day	North	Edge	Solid	25/11/2018	1	12:38	Dry	38	112	2	0	105	110		0
19	Day	North	Edge	Solid	25/11/2018	1	12:38	Dry	38	112	3	0	106	110		0
19	Day	North	Edge	Solid	25/11/2018	1	12:38	Dry	38	112	4	0	105	110		0
19	Day	North	Edge	Solid	25/11/2018	1	12:38	Dry	38	112	5	0	105	110		0
19	Day	North	Edge	Solid	25/11/2018	1	12:38	Dry	38	112	6	0	106	110		0
19	Day	North	Edge	Solid	25/11/2018	1	12:38	Dry	38	112	7	0	106	110		0
19	Day	North	Edge	Solid	25/11/2018	1	12:38	Dry	38	112	8	0	106	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	1	0	105	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	2	0	105	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	3	0	105	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	4	0	106	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	5	0	105	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	6	0	106	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	7	0	106	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	8	0	105	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	9	0	105	110		0
19	Day	South	Edge	Solid	25/11/2018	1	12:34	Dry	38	112	10	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	1	0	107	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	2	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	3	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	4	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	5	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	6	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	7	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	8	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	9	0	105	110		0
20	Day	North	Edge	Solid	25/11/2018	1	14:37	Dry	41	82	10	0	105	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	1	0	107	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	2	0	108	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	3	0	107	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	4	0	107	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	5	0	107	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	6	0	107	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	7	0	107	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	8	0	107	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	9	0	107	110		0
20	Day	South	Edge	Solid	25/11/2018	1	14:35	Dry	40	88	10	0	107	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	1	0	101	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	2	0	102	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	3	0	102	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	4	0	101	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	5	0	102	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	6	0	102	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	7	0	102	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	8	0	102	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	9	0	101	110		0
20	Night	North	Edge	Solid	25/11/2018	1	20:30	Dry	32	0	10	0	99	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	1	0	101	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	2	0	102	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	3	0	101	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	4	0	100	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	5	0	100	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	6	0	99	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	7	0	96	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	8	0	95	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	9	0	94	110		0
20	Night	South	Edge	Solid	25/11/2018	1	20:28	Dry	32	0	10	0	97	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	1	0	98	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	2	0	106	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	3	0	107	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	4	0	106	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	5	0	106	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	6	0	106	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	7	0	107	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	8	0	107	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	9	1	106	110	Forced Error. Too small recovery distance.	
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	10	0	107	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	11	0	102	110		0
21	Day	North	Edge	Solid Tactile	26/11/2018	1	11:17	Dry	36	112	12	0	101	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	1	0	106	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	2	0	106	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	3	0	106	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	4	0	106	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	5	0	106	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	6	0	106	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	7	0	107	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	8	0	106	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	9	0	106	110		0
21	Day	South	Edge	Solid Tactile	26/11/2018	1	11:12	Dry	35	110	10	0	106	110		0
22	Day	North	Edge	Solid	26/11/2018	1	12:25	Dry	38	112	1	0	105	110		0
22	Day	North	Edge	Solid	26/11/2018	1	12:25	Dry	38	112	2	0	105	110		0
22	Day	North	Edge	Solid	26/11/2018	1	12:25	Dry	38	112	3	0	105	110		0
22	Day	North	Edge	Solid	26/11/2018	1	12:25	Dry	38	112	4	0	105	110		0
22	Day	North	Edge	Solid	26/11/2018	1	12:25	Dry	38	112	5	0	105	110		0
22	Day	North	Edge	Solid	26/11/2018	2	12:28	Dry	38	112	1	0	106	110		0
22	Day	North	Edge	Solid	26/11/2018	2	12:28	Dry	38	112	2	0	104	110		0
22	Day	North	Edge	Solid	26/11/2018	2	12:28	Dry	38	112	3	0	105	110		0
22	Day	North	Edge	Solid	26/11/2018	2	12:28	Dry	38	112	4	0	105	110		0
22	Day	North	Edge	Solid	26/11/2018	2	12:28	Dry	38	112	5	0	104	110		0
22	Day	North	Edge	Solid	26/11/2018	2	12:28	Dry	38	112	6	0	103	110		0
22	Day	South	Edge	Solid	26/11/2018	1	12:23	Dry	37	112	1	0	105	110		0
22	Day	South	Edge	Solid	26/11/2018	1	12:23	Dry	37	112	2	0	106	110		0
22	Day	South	Edge	Solid	26/11/2018	1	12:23	Dry	37	112	3	0	106	110		0
22	Day	South	Edge	Solid	26/11/2018	1	12:23	Dry	37	112	4	0	105	110		0
22	Day	South	Edge	Solid	26/11/2018	1	12:23	Dry	37	112	5	0	105	110		0
22	Day	South	Edge	Solid	26/11/2018	1	12:23	Dry	37	112	6	0	105	110		0
22	Day	South	Edge	Solid	26/11/2018	2	12:27	Dry	38	113	1	0	104	110		0
22	Day	South	Edge	Solid	26/11/2018	2	12:27	Dry	38	113	2	0	105	110		0
22	Day	South	Edge	Solid	26/11/2018	2	12:27	Dry	38	113	3	0	105	110		0
22	Day	South	Edge	Solid	26/11/2018	2	12:27	Dry	38	113	4	0	105	110		0
22	Day	South	Edge	Solid	26/11/2018	2	12:27	Dry	38	113	5	0	102	110		0
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	1	0	108	110		0
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	2	0	108	110		0
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	3	0	107	110		0
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	4	0	107	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	5	0	106	110		0
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	6	0	106	110		0
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	7	1	106	110	Forced Error. Too small recovery distance.	
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	8	0	106	110		0
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	9	0	106	110		0
23	Day	North	Edge	Solid	26/11/2018	1	13:33	Dry	38	102	10	0	106	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	1	0	103	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	2	0	105	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	3	0	107	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	4	0	106	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	5	0	105	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	6	0	103	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	7	1	102	110	Forced Error. Too small recovery distance.	
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	8	0	101	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	9	0	102	110		0
23	Day	South	Edge	Solid	26/11/2018	1	13:31	Dry	38	100	10	0	102	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	1	0	98	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	2	0	100	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	3	0	103	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	4	0	105	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	5	1	105	110	Forced Error. Too small recovery distance.	
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	6	0	106	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	7	0	105	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	8	0	104	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	9	0	103	110		0
23	Night	North	Edge	Solid	27/11/2018	1	20:57	Dry	26	0	10	0	103	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	1	0	97	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	2	0	101	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	3	0	105	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	4	0	107	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	5	0	109	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	6	0	110	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	7	0	108	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	8	0	108	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	9	0	106	110		0
23	Night	South	Edge	Solid	27/11/2018	1	20:55	Dry	27	0	10	0	106	110		0
24	Day	North	Edge	Solid	26/11/2018	1	14:32	Dry	39	89	1	0	104	110		0
24	Day	North	Edge	Solid	26/11/2018	1	14:32	Dry	39	89	2	0	103	110		0
24	Day	North	Edge	Solid	26/11/2018	1	14:32	Dry	39	89	3	0	103	110		0
24	Day	North	Edge	Solid	26/11/2018	1	14:32	Dry	39	89	4	0	102	110		0
24	Day	North	Edge	Solid	26/11/2018	1	14:32	Dry	39	89	5	0	103	110		0
24	Day	North	Edge	Solid	26/11/2018	2	14:35	Dry	38	88	1	0	102	110		0
24	Day	North	Edge	Solid	26/11/2018	2	14:35	Dry	38	88	2	0	105	110		0
24	Day	North	Edge	Solid	26/11/2018	2	14:35	Dry	38	88	3	0	105	110		0
24	Day	North	Edge	Solid	26/11/2018	2	14:35	Dry	38	88	4	0	105	110		0
24	Day	North	Edge	Solid	26/11/2018	2	14:35	Dry	38	88	5	0	104	110		0
24	Day	South	Edge	Solid	26/11/2018	1	14:31	Dry	39	89	1	0	101	110		0
24	Day	South	Edge	Solid	26/11/2018	1	14:31	Dry	39	89	2	0	103	110		0
24	Day	South	Edge	Solid	26/11/2018	1	14:31	Dry	39	89	3	0	103	110		0
24	Day	South	Edge	Solid	26/11/2018	1	14:31	Dry	39	89	4	0	102	110		0
24	Day	South	Edge	Solid	26/11/2018	1	14:31	Dry	39	89	5	0	101	110		0
24	Day	South	Edge	Solid	26/11/2018	2	14:34	Dry	38	91	1	0	98	110		0
24	Day	South	Edge	Solid	26/11/2018	2	14:34	Dry	38	91	2	0	98	110		0
24	Day	South	Edge	Solid	26/11/2018	2	14:34	Dry	38	91	3	0	104	110		0

Site	Day/ Night	Travel Direction	Line Side	Line Type	Run Date	Run Number	Run Time	Run Conditions	Run Temperature	Run Light Level	Event Number	Failure	Speed	Limit	Notes	Unforced Error
24	Day	South	Edge	Solid	26/11/2018	2	14:34	Dry	38	91	4	0	104	110		0
24	Day	South	Edge	Solid	26/11/2018	2	14:34	Dry	38	91	5	1	105	110	Forced Error. Too small recovery distance.	
24	Night	North	Edge	Solid	27/11/2018	1	21:25	Dry	25	0	1	0	91	110		0
24	Night	North	Edge	Solid	27/11/2018	1	21:25	Dry	25	0	2	0	92	110		0
24	Night	North	Edge	Solid	27/11/2018	1	21:25	Dry	25	0	3	0	92	110		0
24	Night	North	Edge	Solid	27/11/2018	2	21:28	Dry	25	0	1	0	99	110		0
24	Night	North	Edge	Solid	27/11/2018	2	21:28	Dry	25	0	2	0	100	110		0
24	Night	North	Edge	Solid	27/11/2018	2	21:28	Dry	25	0	3	1	101	110	Forced Error. Too small recovery distance.	
24	Night	North	Edge	Solid	27/11/2018	3	21:35	Dry	25	0	1	0	99	110		0
24	Night	North	Edge	Solid	27/11/2018	3	21:35	Dry	25	0	2	0	100	110		0
24	Night	North	Edge	Solid	27/11/2018	3	21:35	Dry	25	0	3	1	102	110	Forced Error. Too small recovery distance.	
24	Night	South	Edge	Solid	27/11/2018	1	21:27	Dry	26	0	1	0	92	110		0
24	Night	South	Edge	Solid	27/11/2018	1	21:27	Dry	26	0	2	0	93	110		0
24	Night	South	Edge	Solid	27/11/2018	1	21:27	Dry	26	0	3	0	91	110		0
24	Night	South	Edge	Solid	27/11/2018	2	21:32	Dry	25	0	1	0	98	110		0
24	Night	South	Edge	Solid	27/11/2018	2	21:32	Dry	25	0	2	0	100	110		0
24	Night	South	Edge	Solid	27/11/2018	2	21:32	Dry	25	0	3	0	99	110		0
24	Night	South	Edge	Solid	27/11/2018	3	21:36	Dry	26	0	1	0	97	110		0
24	Night	South	Edge	Solid	27/11/2018	3	21:36	Dry	26	0	2	0	97	110		0
24	Night	South	Edge	Solid	27/11/2018	3	21:36	Dry	26	0	3	0	96	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	1	0	105	110	Tyre marks over edge lines.	0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	2	0	105	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	3	0	106	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	4	0	105	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	5	0	105	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	6	0	106	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	7	0	106	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	8	0	105	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	9	0	105	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	10	0	106	110		0
25	Day	North	Edge	Solid	26/11/2018	1	10:31	Dry	35	108	11	0	106	110	Over heavy dust markings.	0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	1	0	106	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	2	0	106	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	3	0	105	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	4	0	106	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	5	0	106	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	6	0	106	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	7	0	106	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	8	0	106	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	9	0	106	110		0
25	Day	South	Edge	Solid	26/11/2018	1	10:31	Dry	34	103	10	0	106	110		0