Scientific Professional and Technical Services Framework
Task Ref: 1-021

Task Title: Road Safety Audit - Maintain & Develop the Road Safety Audit Database

QUARTERLY REPORT
July 2016 to September 2016

To be read in conjunction with 'QUARTERLY REPORTING AND FACTSHEETS, GUIDANCE NOTES' published at the front of the July 2015 to September 2015 Quarterly Report (T-TEAR* Task 479(4/45/12)ATK*)

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Author	Neil Hutchings
Owner	Nicholas Bentall
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Nicholas Bentall	Reviewer

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1. Introduction

1.1. Quarterly Reporting

This report comprises the quarterly qualitative review of Road Safety Audit (RSA) reports submitted to the Highways England Safer Roads - Design Team (SRDT) inbox at roadsafetyaudit@highwaysengland.co.uk between **1st July 2016 and 30th September 2016** (inclusive).

This review should be read in conjunction with the **Quarterly Factsheet - July-September 2016 (Rev. 2)** contained in Appendix A of this report; and with ***'Quarterly Reporting and Factsheets, Guidance Notes'*** published at the front of the July 2015 to September 2015 Quarterly Report (T-TEAR Task: 479(4/45/12)ATK).

1.2. Scope

During this quarter, a total of 74 RSAs were submitted, of which 67 were carried out to HD19/15. From the HD19/15 reports, 12 sample reports were selected as suitable for review. The list below details the numbers of each stage of RSA forming the study sample together with totals submitted for the quarter. All figures in the list relate to RSAs carried out HD19/15.

- Stage 1 RSAs — 2 reports of 3 submitted in quarter
- Stage 2 RSAs — 2 reports of 3 submitted in quarter
- Combined Stage 1 & 2 RSAs — 2 reports of 17 submitted in quarter
- Stage 3 RSAs — 2 reports of 23 submitted in quarter
- Stage 4 RSAs (12 months) — 2 reports of 9 submitted in quarter
- Stage 4 RSAs (36 months) — 2 reports of 12 submitted in quarter

No Interim RSAs were submitted to the SRDT inbox this July 2016 to September 2016 quarter.

The principal purpose of the quarterly review, together with explanations of the sampling process; measures of HD19/15 compliance and of the rationale behind the charting used in the corresponding quarterly factsheets are all described in the Guidance Notes in the pre-amble to the July to September 2015 report (T-TEAR Task: 479(4/45/12)ATK).

1.3. Potential Discrepancies

As the update of the Highways England's RSA Database continues there may remain some unavoidable discrepancies between data for this quarter under review and those recorded previously. Accordingly, comparisons detailed in this quarterly report should be taken as indicative only.

In order to minimise the effect of discrepancies on data comparisons, the database has been retrospectively updated as far as is practicable. For this purpose, previously entered records were updated by a previous project as far back as 1st January 2014. It is those backdated records that have been used where comparisons are made. It is expected that discrepancies between recent data and those entered previously, and any resulting errors, will lessen as the data record grows.

It should be noted that a number of draft RSA reports have been issued to the SRDT inbox. HD19/15 only requires the submission of final reports and so drafts submitted since 1st January 2014 have been removed from the database. This has resulted in only minor changes in the Appendix 1 factsheet. The largest change (4%) is accounted for by the increase in the proportion of reports complying with the need for a signed RSA Team Statement. Further comment about the issue of draft reports is made in Section 2 of this report.

1.4. RSAs Submitted by Highways England Areas

Figure 1-1 below illustrates all RSAs submitted to the SRDT inbox since 1st January 2014 by each Highways England area.

Figure 1-1 RSA submitted since 1st January 2014

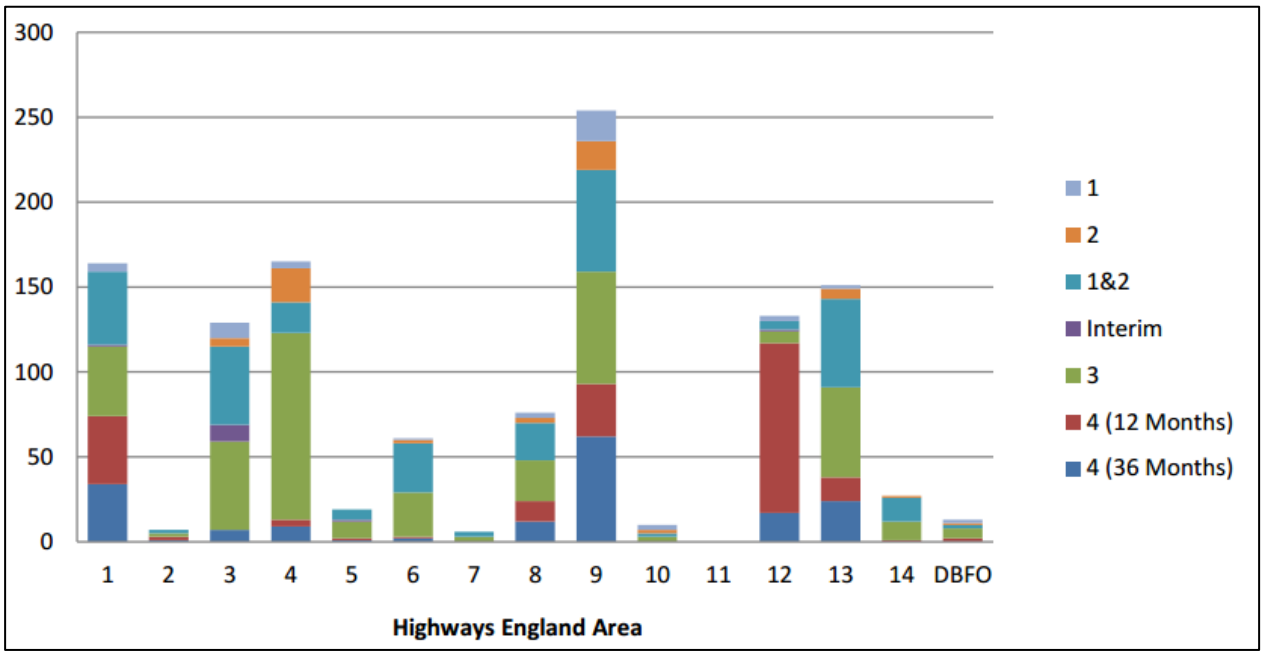
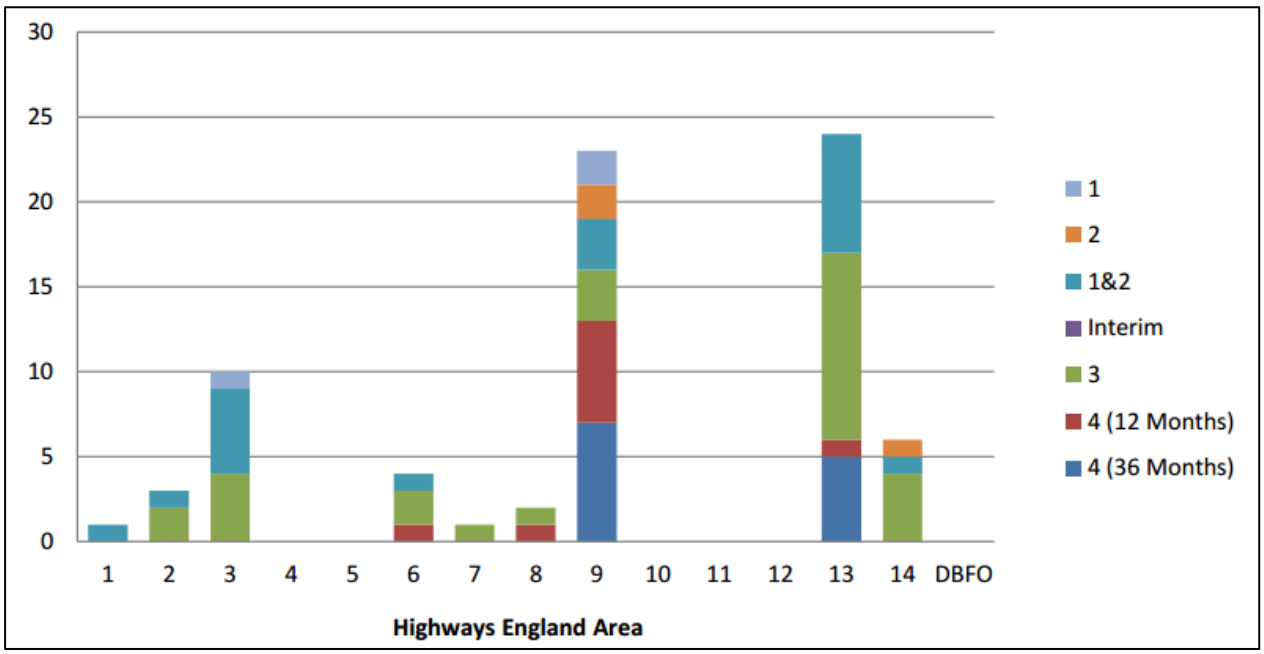


Figure 1-2 below illustrates all RSAs submitted to the SRDT inbox during this quarter, 1st July 2016 to 30th September 2016.

Figure 1-2 RSAs submitted this quarter (July to September 2016)



It should be noted that, since 2009, Area 11 is no longer in use. It is retained in the database outputs, however, for the purpose of historical research.

2. Qualitative Review of RSA Reports

This section comprises a qualitative review of RSAs sampled from those recorded in the main database. The sample selection is described under heading 1.2 above. The sampled reports have been used as the principal source for this review but occasionally, reference is made to the database as a whole for context.

As far as is practicable, this quarterly report seeks to feed discussion on:

- Common road safety problems raised by audit teams with a view to providing information which might be used by the SRDT and others in the industry to identify and inform potential changes to Requirements and Advice Documents (RADs). This comprises a high-level categorisation of the problems raised;
- Inconsistencies between problems and recommendations raised for similar designs elements; and
- Good practice and areas for potential improvement as evident from the sampled RSA reports.

2.1 Common Road Safety Problems

This section comments on common road safety problems identified by RSAs in the sample set (see details under heading 1.2).

For clarity, this section uses the following terms of reference:

- Problems – indexed text (i.e. 'Problem A') detailing road safety concerns in the standard RSA Problem/Recommendation format;
- Issues – individual elements of distinct road safety concern contained within a problem related to but different in nature to other Issues within that same problem; and
- Recommendations – remedial recommendations made by the RSA Team in relation to the problem (and related Issues) raised.

Where appearing in quoted text, the words *"problem"*, *"issue"* and *"recommendation"* may have been used differently.

The sampled reports detailed a total of 63 road safety problems covering 74 Issues. These include previously raised problems not resolved at the time of each of the sample RSAs.

This gives an average of 1.17 Issues per Problem reported which represents a slight increase from 1.08 in the preceding quarterly report (April 2016 to June 2016) but no obvious significance can be attached to this increase.

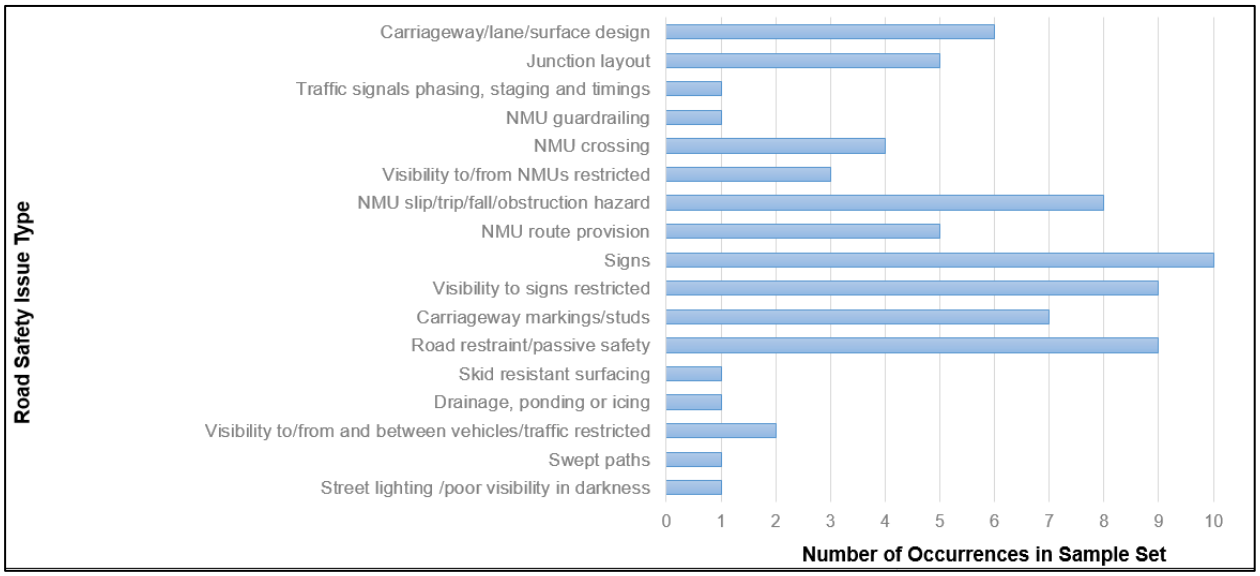
For the purpose of this quarterly report, the high level categorisation of the problems and Issues identified within the sample group have been expressed as follows:

- **Carriageway/lane/surface design** [alignment / surfacing (not inc. HFS) / chamber covers (skid risk) / road or lane width / taper lengths (not inc. junctions) / tie-ins]
- **Junction layout** [design / principle / tie-ins / taper lengths / radii / approach speeds / turning speeds / queuing / stacking / restricted movements]
- **Traffic signals phasing, staging and timings** [conflicts / gap opportunities / queuing / stacking / junction clearing]
- **NMU guardrailing** [absence / inappropriate / inadequate / excessive / clearance between]
- **NMU crossing** [inconspicuous / restricted visibility / inconsistent / absent / inadequate / gradient / layout / confusing / tactile paving]

- **Visibility to / from and between NMUs restricted** [by vegetation / street furniture / infrastructure / buildings]
- **NMU slip / trip / fall / obstruction hazard** [poor surface / unprotected drops / street furniture / upstands / service and drain covers]
- **NMU route** [inconsistent / inadequate / inappropriate / obstructed / narrow / gradient / confusing / tactile warning surfaces]
- **Signs** [poorly located or incorrectly mounted / inconsistent / absent / incorrect / inadequate / confusing]
- **Visibility to signs restricted** [by vegetation / street furniture / infrastructure / buildings]
- **Carriageway markings or studs** [poorly located / inconspicuous / inconsistent / absent / incorrect / inadequate / confusing]
- **Road restraint / passive safety** [safety fence / bridge parapet / kerbs absent / kerbs inadequate / working width compromised / risk of 'launch' / passive safety]
- **Skid resistant or high friction surfacing** [poorly located / inconsistent / absent / incorrect / inadequate / confusing]
- **Drainage and related ponding and icing** [NMU crossings / carriageways / footways / cycleways / other]
- **Visibility to / from and between vehicles / traffic restricted** [by vegetation / street furniture / infrastructure / buildings]
- **Swept paths** [overrunning footways or cycleways / conflicts between vehicles / collision with infrastructure or furniture]
- **Street lighting / poor visibility in darkness** [inadequate / absence of lighting / confusing]

The 74 Issues covered in the sampled reports are categorised in Figure 2-1 below which indicates the frequency of occurrence. The categories of these are shortened to fit the figure dimensions and the chart should be read in conjunction with the bullet list above for a fuller description.

Figure 2-1 Road safety issues by number of occurrences

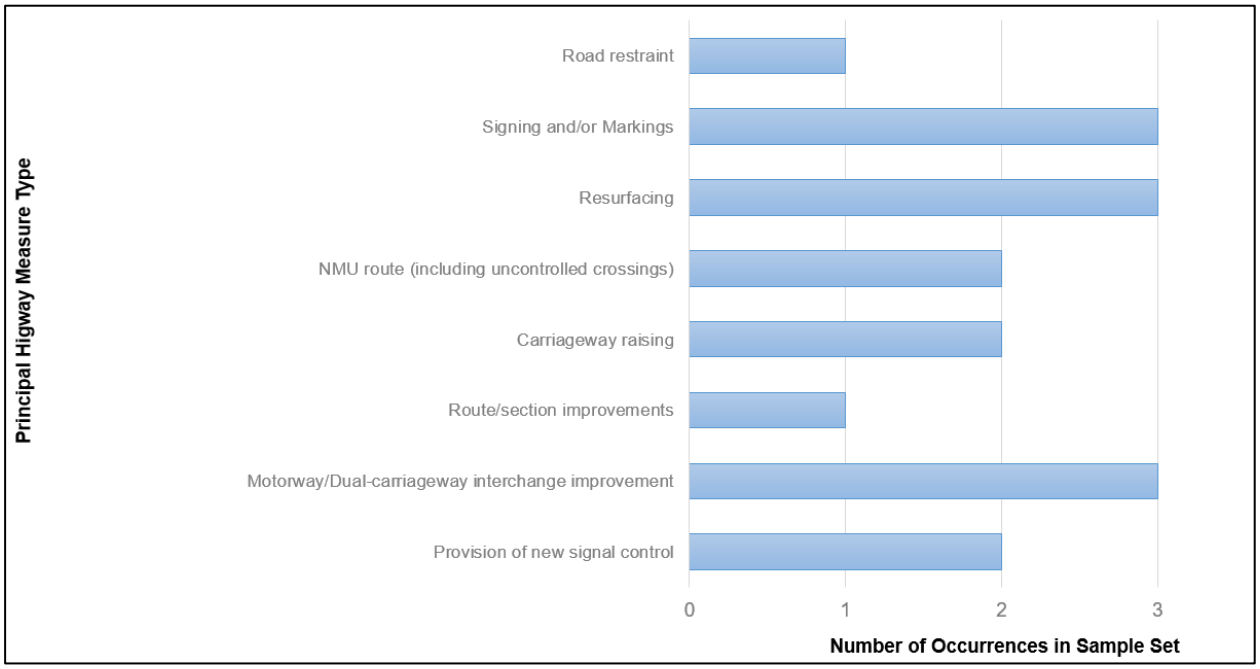


As context for the road safety Issues by number of occurrences given in Figure 2-1, a chart detailing the principal highway measures covered by the RSA reports by number of occurrences in the sample set is given in Figure 2-2.

It should be noted that the measures described in Figure 2-2 are considered to be the highway measures representing the principal focus of the schemes as described in the sample group

report titles or in scheme descriptions therein. Some schemes may have involved more than one principal measure and an attempt has been made to represent that. However, the list is not intended to detail every single measure. For instance, the principal measure categorisation 'Signing and/or Markings' in Figure 2-2, means that the associated scheme was a signing scheme in the main and does not include other schemes, such as 'Roundabout improvement', which may have included signing measures.

Figure 2-2 Principal highway measures by number of occurrences



2.2 Inconsistencies

One of the project aims is to identify any inconsistencies in the way that similar RSA problems are dealt with across different RSA reports.

In the sample reports examined, there is very little commonality between specific Issues and so recommendations are not generally comparable between reports this quarter.

There are a number of differences and inconsistencies regarding the various styles of describing problems and related recommendations evident in the sampled reports. These are discussed in general under heading 2.3, 'Good Practice and Area's for Improvement' below.

2.3 Good Practice and Areas for Improvement

This section identifies areas of good practice along with other areas of potential improvement as evident from the RSAs sampled for the purpose of this quarterly report.

Text and other materials quoted or copied from real RSA reports have been anonymised. Accordingly, all road, scheme and location names and descriptions, together with the names of persons and organisations involved, should be taken as fictional and not associated with any actual scheme, location, organisation or person.

2.3.1 Previously Raised Areas for Improvement still Prevalent

In addition to the identification of areas of good practice, the quarterly reports identify areas where the application of the RSA process and reporting might benefit from some improvement. Some key areas, as identified by the previous quarterly reports, remain prevalent in the current sample

group and so are summarised here and cross-referenced (in brackets) to the report in which the issue was first identified:

- **Combined Stage 1 & 2 RSAs**
  A total of 17 Combined Stage 1 & 2 RSA were submitted to the SRDT inbox this July-September 2016 quarter compared to only three Stage 1 and three Stage 2 RSAs submitted. There is nothing to suggest that the two Combined Stage 1 & 2 RSAs in the sample group of reports were of such a nature that combined report would have been inappropriate but, the apparently high proportion of Combined Stage 1 & 2 reports delivered still remains a concern and suggests that decisions to combine these RSA stages might be based on commercial and programming considerations contrary to HD19/15 instruction.
- **Pre-opening Collision Data**
  All four of the Stage 4 RSA reports sampled this quarter (all from the same provider) include consideration of collisions during construction periods. This may skew the collision analysis due to potential changes in traffic speeds, flows and queues; temporary traffic management and various methods of control for examples.
- **Information Not Provided**
  It remains common for RSA reports to refer to information not provided as having not been considered or as the very basis of problems themselves. If the RSA Team have cause to think that missing information should have been provided, they are required to ask for that information.
- **Draft Reports Issued to SRDT Inbox**
  A number of reports submitted to the SRDT Inbox are demarcated as 'Draft'. HD19/15 does not require drafts to be submitted in this way and only final reports should be sent to the SRDT email address. There is concern that this is indicative of RSA reports not being finalised. RSA Team Leaders will usually wait for confirmation from the Project Sponsor that the draft issued meets the scope and Terms of Reference but sometimes that instruction is not forthcoming. It is common for draft RSA reports to be kept on file and draft versions are often issued to subsequent RSA Teams as part of the brief for the next stage of audit (even if a final RSA was issued). Project Sponsors should instruct issue of the final report when they are satisfied that the draft meets the scope and Terms of Reference and when they have discussed potential changes to recommendations with the RSA Team (as described by HD19/15). When issuing the draft, the RSA Team Leader should perhaps give a reasonable deadline for comments ('reasonable' would vary from scheme to scheme) and should chase instruction or issue the report as final when that deadline is reached. **See comment under heading 1.3, paragraph 3.**
- **Stage 4 RSAs (36 months) not as described in HD19/15**
  The illustrative 36 month monitoring report given in Annex H of HD19/15 details a much more thorough analysis of collision and flow data than is apparent in the sampled Stage 4 RSAs. It is a concern, that none of the Stage 4 (36 month) RSAs reviewed this July-September 2016 quarter comply with the illustrative report approach. Instead, they are presented identically to the 12 month monitoring reports submitted by the same supplier.

2.3.2 Site Visit Conditions

It appears to be increasingly common for RSA Teams to use ambiguous descriptions regarding site visit conditions, particularly when describing traffic flows and congestion. For example, a number of the sampled reports cite:

"No unexpected queuing or delays were noted during the site visit."

This phrase does not explain what queuing or delays were 'expected' or the basis for those 'expectations'. Nor does it describe what level of queuing or delays was actually observed on site.

Comparison between actual queues or delays observed and 'expected' queues or delays might be quite useful but only if explained clearly.

2.3.3 Sign Schedules

A number of the sampled Stage 2 or Combined Stage 1 & 2 RSAs cite the provision of a signing schedule. For any detailed design on a scheme involving any changes to signing, it seems sensible that a signing schedule would be required to inform the RSA Team with regard to sign mounting heights and post dimensions for example.

It is recognised that such signing detail is sometimes included in GA or signing drawings but there is no evidence that this is the case in the reports sampled.

2.3.4 Recommendation Wording

Great care should be taken when wording recommendations. Poor phrasing can result in poor design of the remedial measure. One commonly seen example is as follows:

"Ensure a preferred minimum width of 3m is provided throughout the new shared use facility."

Read literally, this could be interpreted as "provide a 3m wide facility" and, of more concern, suggests that the minimum recommended provision would be sufficient. The RSA Team probably meant "provide a facility of at least 3m wide" but there is an important difference. The designer has a responsibility to thoroughly determine the level of provision required in terms of standard compliance, safety and capacity and should risk assess design solutions.

A more appropriate recommendation might have been:

"The width of the proposed shared-use facility should be increased as appropriate to safely accommodate expected NMU flows"

2.3.5 Understanding Maintenance Requirements

One RSA report refers to what is described as a maintenance bay which, when used, would cause obstruction to a proposed shared-use facility.

What is actually existing at the site in question is a section of flush-kerb to allow maintenance vehicles to mount the footway/cycleway to access some adjacent cabinets. It is recognised that vehicles using this facility would indeed obstruct the shared-use facility. However the recommendation is to prevent maintenance access at the existing location, and suggests a proposed new maintenance access provision elsewhere on the large roundabout junction. It might not be appropriate or safe to recommend use of a more remote maintenance parking facility and it might have been better to recommend amendment to the existing to facilitate safe access/egress by maintenance vehicles rather than closing the facility off.

Bearing in mind that use of the maintenance facility might be infrequent, the risk of conflict/collision with, or obstruction to NMUs might also be mitigated by maintenance operative risk assessments and documented safe working practices.

2.3.6 Stage 4 RSA Site Visit Deliberations

In one of the Stage 4 RSAs contained a statement as follows:

"Considering the low number of collisions recorded post scheme completion it was felt that a full detailed analysis was unnecessary. Instead, the circumstances of the collisions recorded post scheme completion are briefly explored below"

The total number of collisions recorded was two (post-opening) and 10 (pre-opening). Whilst it is recognised that a 'detailed analysis' might not have revealed any significant findings, it is considered inappropriate to make that decision based solely on an overview of the collision numbers.

2.3.7 Problem Resolution

One Stage 4 RSA report makes reference to a number of problems being *"dealt with by the designer's response"*. Critically, it is design amendments actually carried forward to implementation which would close out any previously raised RSA problems and not just the designer's response.

That said, it is not the purpose of a Stage 4 RSA to police the implementation (or not) of remedial measures. Rather, RSA Teams should limit their comments to discussing whether or not the previously raised problems or resulting actions appear to have contributed the post-scheme collisions, particularly any adverse change in collision numbers or trends.

2.3.8 Recommended Removal of Provision

One RSA detailed a problem regarding the provision of safety fence. The report seemed to assert that the safety fence provision in question was unnecessary and would introduce a hazard. This can, of course, be true in some cases but the description given was unclear about what the hazard was. In any case, it is probably best not to recommend removal of any design feature specifically intended to protect road users. Instead design improvements would be a better recommendation. In any case, the wording of the problem should clearly and unambiguously describe how the design presented would create a hazard. The recommendation to remove such a feature in the absence of a clear problem description might lead to removal without proper consideration of the risks.

2.3.9 Unrealistic Problems

One of the reviewed reports cites the location of right-turn arrows as a potential cause of drivers striking a refuge in the junction mouth. No annotated plan was provided so it is not possible to judge whether or not the problem raised has merit but it seems unlikely that an arrow location would cause such an incident.

In the same report, one problem cites a sign location near the centre of a large island being a potential cause of drivers hitting the island. This appears to be a nonsensical concern.

Such unrealistic problems might end up being summarily dismissed by designers and Project Sponsors without due consideration. Conversely, designers might unnecessarily re-design elements on the face value of the problem raised.

HD19/15 is clear that problems identified should be supported by background reasoning. It is felt that in carefully considering what reasoning they are going to include, RSA Teams might be better able to filter out unrealistic or nonsensical problems.

2.3.10 Police not Invited to Stage 3 RSA Site Visit

On some occasions, Stage 3 RSA reports make no reference to the police being invited to the site visit. Whilst it is recognised that some police forces now decline RSA site visit invitations, inviting them is nevertheless a requirement of HD19/15.

2.3.11 Post-construction Recommendations

Occasionally, Stage 3 RSA reports are found to contain recommendations involving significant changes which would involve considerable cost. One Stage 3 RSA report submitted this quarter referred to a wide lane-width leading to increased approach speeds to a bend. The recommendation states *"Reduce the width of the running lane in line with the 50mph approach Speed"*.

Lane narrowing would be a significant post-construction change and might not be practicable to implement. RSA Teams should endeavour, as far as is appropriate, to consider the likely feasibility and practicability of Stage 3 RSA recommendations before making them.

If, after careful consideration, a significant change is still considered to be the best remedy, the RSA Team should make that recommendation. It would then be up to the Project Sponsor to consider, in detail, the balance of risk against expense and decide on whether or not an Exception is required. Questions might be asked of the Stage 2 RSA Team about why such concern was not raised at that earlier RSA.

One report reviewed had 21 Stage 3 RSA problems (including 5 unresolved problems from previous RSAs). This number of problems carried forward to, or created by, construction (especially as the number of RSA problems had increased from Stage 2 to Stage 3) suggests that something has gone seriously wrong with the RSA process either at Stage 3 or at a previous stage. Project Sponsors should actively engage in the RSA and post-RSA processes to ensure that they are robustly and effectively implemented.

2.3.12 Designer's Responses

Reference to a *"Designer's Response Report"* as opposed to the *"RSA Response Report"* described in HD19/15 post-RSA procedure is common. More than just the terminology, however, there is concern more so about the actual process described in RSA reports. A number of the reports submitted summarise or detail designer's responses to problems and, worryingly, describe problems as being resolved by designer proposals to update the drawings for instance. This is symptomatic of the responses being made immediately after issue of the RSA report (maybe even the draft) and does not reflect any discussion between designer and Project Sponsor about exactly how a remedy would be implemented.

When RSA Response Reports are issued as part of the RSA Brief for a subsequent Stage, they should accurately reflect the design decisions made and approved up to that point in time. There is no need then for the RSA report to enter into any debate regarding responses but, in the absence of a formal Exception, RSA reports should simply re-state the problem as detailed in HD19/15's model reports.

3. Signs and Markings Issues

At the request of the Project Sponsor for this task, this quarterly report contains a more detailed review of signing and marking issues raised in all RSA reports submitted to Highways England.

This quarter, reports submitted to the database included a total of 52 problems or recommendations detailing or including a total of 63 issues related to signs or markings.

In this summary of signing and marking issues raised, it has not been practicable to give consideration to the merit or validity of the issues described.

In summary, the most prevalent issues recorded this quarter related to signs being obscured by vegetation (15 occurrences) and the absence of signs where the RSA Team thought they would be beneficial (15 occurrences).

The sign type (where specified) that features most under various issues is direction signs (11) of which 6 were detailed as being obscured by vegetation.

Figure 3-1 overleaf depicts the sign types and issues in matrix form.

Figure 3-1 Signing and Lining Issues recorded this Quarter

	Poorly located	Obscured by vegetation	Not passively safe	Absence of	Sign location unclear	Low mounting height	Poor alignment	Existing incorrectly represented	Old markings remain visible	Obscured by other signs	Confusing/misleading	Markings too narrow	Inappropriate type	Poorly orientated	Obscured (other)	Non-compliant design	Insecure	Incorrect use	Totals
Bifurcation arrows																			0
Chevron signs	1	2																	3
Clearway signs			1																1
Countdown signs		1		1															2
Cycle-route markings				1															1
Direction signs		6	2		1	2													11
Edge lining				3															3
General markings							1												1
General, markings								1											1
Give way markings									1										1
Give way signs		1								1									2
Hatch markings							1				1								2
Lane destination markings				3															3
Lane destination signs				2															2
Lane markings							2					1							3
No through road sign											1								1
Other danger signs					1														1
Part time signals sign		2		1															3
Public bridleway signs			1																1
Right of way signs			1																1
Road studs				1									1						2
Slow markings (cycleway/footway)				1															1
Speed limit signs		1	1											1	1				4
Traffic signals ahead sign				1															1
Turning arrow markings	2																		2
Unspecified signs	1	2								1						1			5
Verge marker posts				1													1		2
Zebra crossing ahead signs																		1	1
Totals	4	15	6	15	2	2	4	1	1	2	2	1	1	1	1	1	1	1	

Appendix A

Quarterly Factsheet
1st July 2016 to 30th September 2016

Road Safety Audit Database

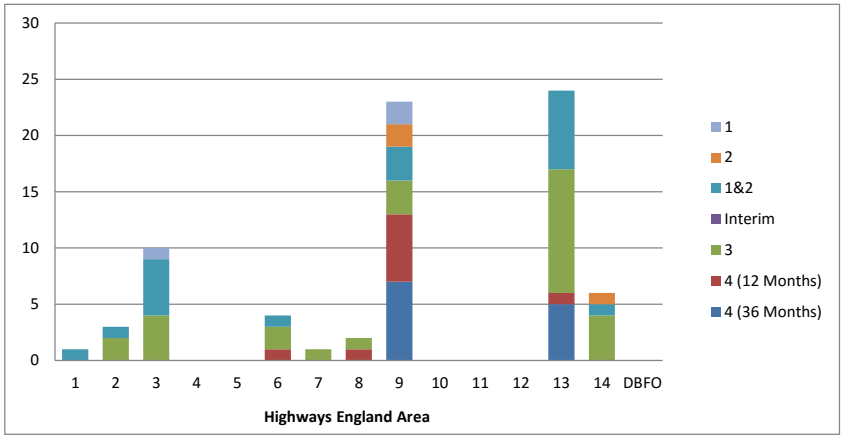
Quarterly Factsheet - 1st July 2016 to 30th September 2016 (Rev. 2)

Basic Information

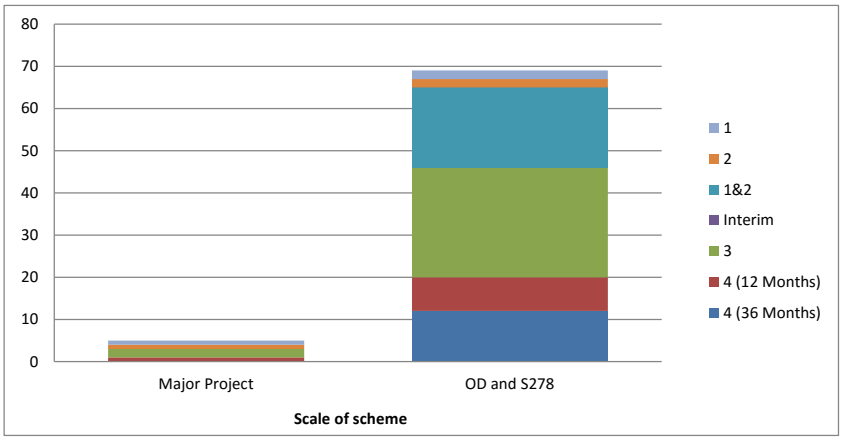
	This Quarter	Database Since Jan 2014
Number of RSAs submitted	74	1207
RSA Team Leader specifically identified	100%	92%
Project Sponsor specifically identified	100%	91%

	This Quarter	Database Since Jan 2014
Average number of problems recorded	1.6	1.5
Response Report issued	3%	2%
Exception Report issued	0%	0%

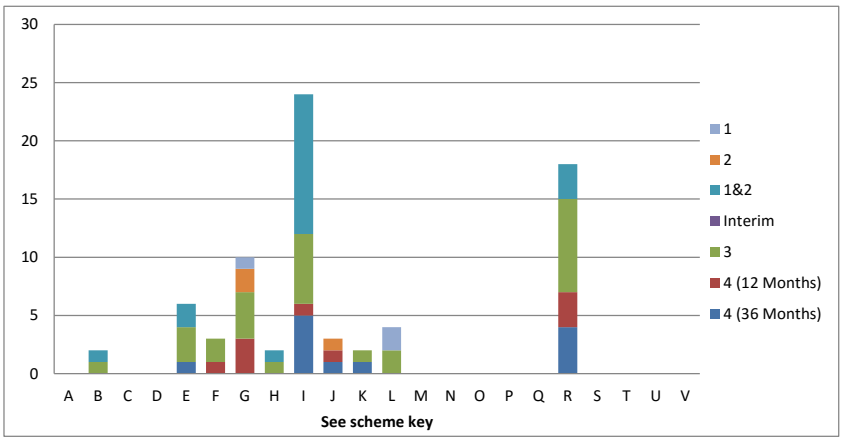
RSAs By Highways England Area - This Quarter



RSAs By Scale of Scheme - This Quarter



RSAs By Scheme Type - This Quarter



Scheme key

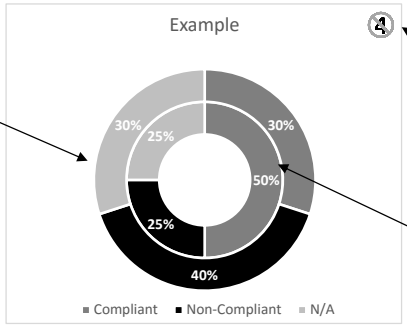
All-Lanes-Running / Smart Motorways	A
Bridge	B
Bus Lane / Guided Bus	C
Conversion from Single to Dual Carriageway	D
Drainage	E
Enforcement Infrastructure / Cameras	F
Junction Improvement	G
Link Improvement	H
Maintenance Infrastructure / Access / Safety	I
Traffic Signals (New)	J
NMU Crossing	K
NMU Path / Way / Route	L
Public Realm / Urban Regeneration	M
Public Transport Interchange / Hub	N
Road / Access Closure or Feature / Facility Removal	O
Shared-Use (NMUs & Traffic)	P
Shared-Use (NMUs Only)	Q
Signs / Markings	R
Temporary Traffic Management	S
Tram or LRT Route / Facility	T
Tunnel	U
Widening	V

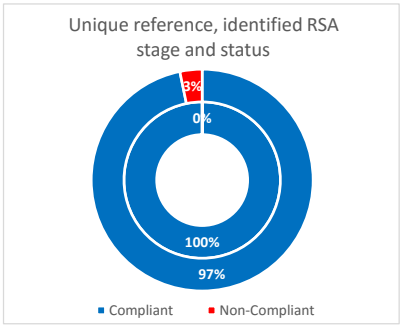
ATKINS

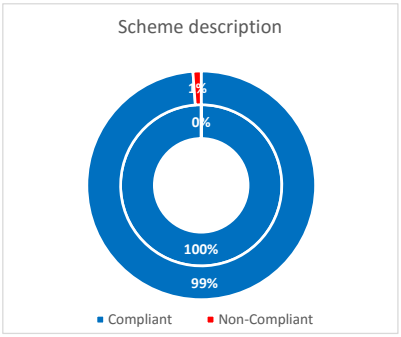
Road Safety Audit Database

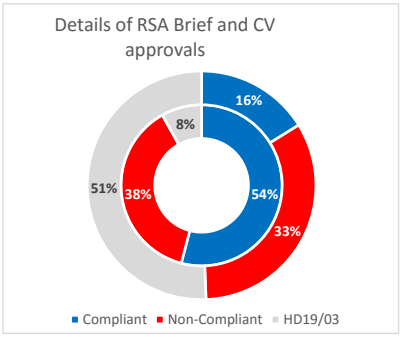
Quarterly Factsheet - 1st July 2016 to 30th September 2016 (Rev. 2)

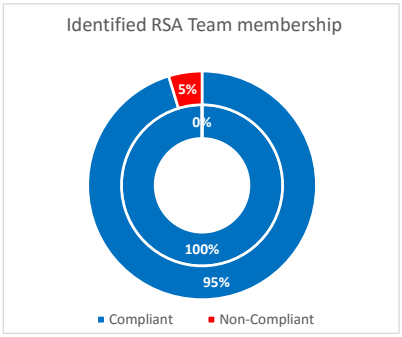
RSAs by Compliances - This Quarter - Refers to all RSA Stages unless indicated (see key)

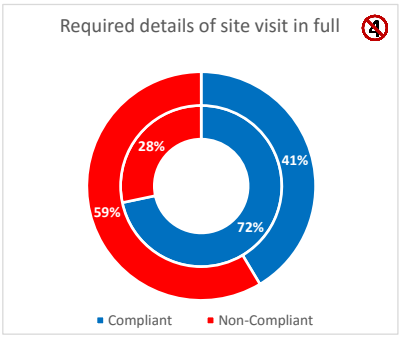


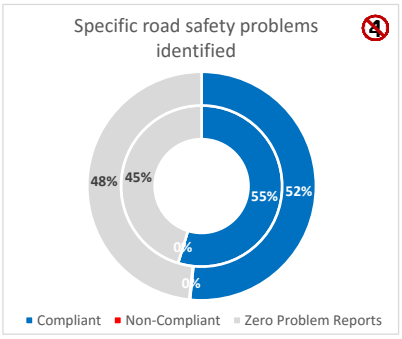


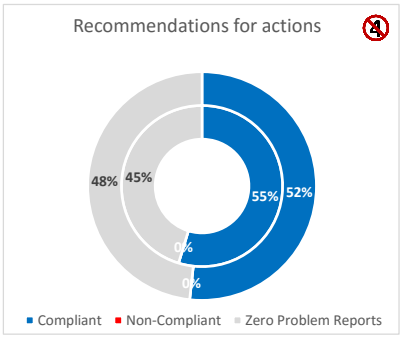


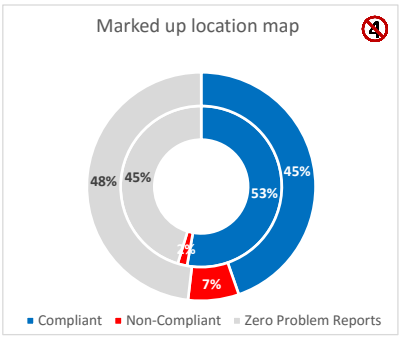


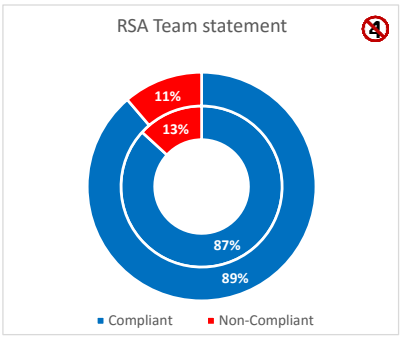


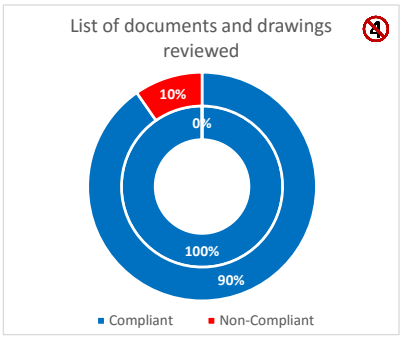


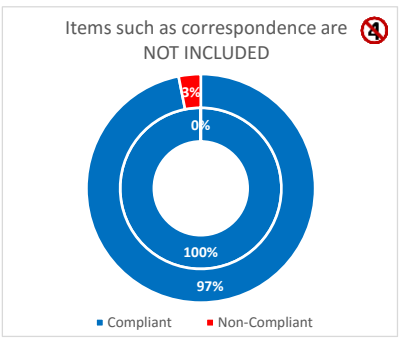


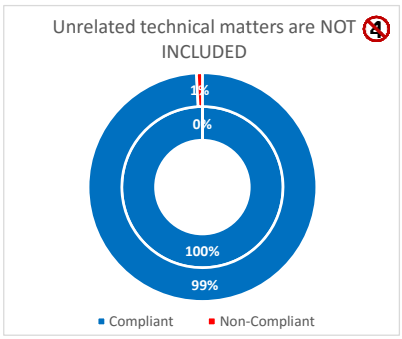


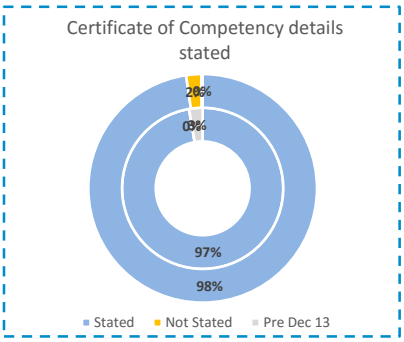












Inclusion of Certificate of Competancy details is not mandatory

ATKINS