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

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

QUARTERLY REPORT
January 2017 to March 2017

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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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 January 2017 and 31st March 2017 (inclusive).

This review should be read in conjunction with the Quarterly Factsheet - January-March 2017 (Rev. 1) 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 223 RSAs were submitted, of which all purport to be carried out to HD19/15. From these, 11 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.

- Stage 1 RSAs: 1 report of 1 submitted in quarter
- Stage 2 RSAs: 2 reports of 16 submitted in quarter
- Combined Stage 1 & 2 RSAs: 2 reports of 6 submitted in quarter
- Stage 3 RSAs: 2 reports of 22 submitted in quarter
- Stage 4 RSAs (12 months): 2 reports of 69 submitted in quarter
- Stage 4 RSAs (36 months): 2 reports of 107 submitted in quarter
- Interim RSAs: 0 reports of 2 submitted in 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 only 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.
1.4. RSAs Submitted by Highways England Areas

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

**Figure 1-1** RSA submitted since 1\textsuperscript{st} January 2014

Figure 1-2 below illustrates all RSAs submitted to the SRDT inbox during this quarter, 1\textsuperscript{st} January 2017 to 31\textsuperscript{st} March 2017.

**Figure 1-2** RSA submitted this quarter (January to March 2017)
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 40 road safety Problems covering 42 Issues. These include previously raised Problems not resolved at the time of each of the sample RSAs.

This gives an average of 1.05 Issues per Problem reported which is comparable to 1.10 in the preceding quarterly report (October 2016 to December 2016) with no obvious significance to the slight decrease. The Issues per Problem ratio has remained consistent around these levels in recent quarters.

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 / skid resistance / surfacing (not incl. HFS) / road width / tie-ins / taper lengths / radii]
- Junction layout [design / principle / tie-ins / approach speeds / turning speeds / queuing / stacking / restricted movements]
- Visibility too great [roundabouts / excessive entry speed / injudicious gap acceptance]
- ‘See-through’ at signals [contradictory signals visible / green signal seen by wrong traffic streams]
- Traffic signals phasing, staging and timings [conflicts / gap opportunities / queuing / stacking / junction clearing]
• **NMU guardrailing** [absence / inappropriate / inadequate / excessive / clearance between]

• **NMU slip / trip / fall / obstruction hazard** [poor surface / unprotected drops / street furniture / upstands / service and drain covers]

• **NMU route provision** [inconsistent / inadequate / inappropriate / narrow / confusing / tactile warning surfaces / access / egress]

• **Carriageway markings** [poorly located / inconspicuous / inconsistent / absent / incorrect / inadequate / confusing]

• **Risk of weaving conflicts** [junction / access / slip road / merge / diverge]

• **Signs** [poorly located or incorrectly mounted / inconsistent / absent / incorrect / inadequate / confusing]

• **Visibility to signs restricted** [by vegetation / street furniture / alignment / infrastructure / buildings]

• **Sign clutter** [confusing]

• **Work zone / maintenance or service access** [poorly located / inconspicuous / absent / unsafe / inadequate / confusing]

• **Road restraint / bridge parapet / passive safety / kerbs** [absent / inadequate / working width compromised / risk of 'launch']

• **Hazardous roadside** [street furniture / objects not passively safe / embankments / drops]

• **Drainage and related ponding and icing** [NMU crossings / carriageways / footways / cycleways / other]

• **Visibility to / from and between vehicles / traffic restricted** [by vegetation / street furniture / alignment / infrastructure / buildings]

The 42 issues covered in the sampled reports are categorised in Figure 2-1 overleaf 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.
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 overleaf.

It should be noted that the measures described in Figure 2-2 are the highway measures considered to represent 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.
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:

- **Pre-opening Collision Data**
  All four of the Stage 4 RSA reports sampled this quarter (all but one 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**
  Three of the 13 sample RSA reports reviewed this quarter refer to information not being provided but give no indication that this information was requested in accordance with HD19/15. A further four RSAs (three of which were Stage 4 RSAs) detail items of information that was “unavailable”. Whilst the latter term might imply that the data had requested, in each case, the report wording is not clear on whether or not that was the case.

From previous quarterly reviews, it is apparent that at least one supplier makes a standard statement in their RSA introductions to the effect:

“It was considered that the information provided was sufficient for the purpose of carrying out this Road Safety Audit.”

This statement is, on occasion, contradicted by text in the Problem/Recommendation section stating that there is concern about “unknown” or absent detail.

RSA Team should be clear about missing information requested but not provided.

- **Stage 4 RSA Site Visit Deliberations**
  Two of the four Stage 4 RSAs detail that a site visit was carried out despite no increase in collision numbers or severity and no evidence of unexpected trends or characteristics. One of these RSAs showed no pre-scheme collisions and no post-scheme collisions and so, in accordance with HD19/15 paragraph 2.49, a Stage 4 RSA was unwarranted.

### 2.3.2 Levels of Analysis in Stage 4 RSAs

One of the Stage 4 (12 month) RSAs sampled for review contains a single and seemingly simple Recommendation “It is recommended that the Problems identified above be appropriately dealt with”.

This Recommendation draws no conclusions with regard to the (slight) increase in collision numbers described in the report and refers only to previously raised Problems which, they consider to be unresolved, despite there being no apparent link to the post-scheme collisions recorded. If Recommendations are made in relation to an identified collision problem, then they should be clear and robust.

The remaining Stage 4 (12 month) RSA report states that there were no post-scheme collisions but focusses, again, on previously raised issues which they consider to be unresolved together with a new issue they felt they had identified despite there being no post-scheme collisions.

Stage 4 RSA reports should describe whether, and how, the post-scheme collision population, severity and characteristics might have been adversely affected by the scheme measures. Unresolved Problems should only be considered in relation to how they might have manifested in the post-scheme collision scenario.

One of the Two Stage 4 (36 month) RSA reports details a reduction in collision numbers (from eight to four) but an increase in severity index from 25% to 50% (slight:serious:fatcal = 6:1:1 changed to 2:0:2). The two post-scheme fatal collisions resulted in three fatalities but was given no detailed analysis and the only conclusion drawn was:

“The two recorded injury collisions within the scheme area are as a result of driver error; in the case of the double fatality and poor weather conditions in the slight injury collision.

It can be concluded that the implemented measures have not contributed to any of the post scheme recorded injury collisions. Those measures introduced have not had a detrimental effect on safety.”

Not only is this factually misleading (there were four collisions, not two), this is a sweeping conclusion based on apparently little analysis. Whilst it is recognised that obtaining detailed
data from the police is not always possible, the RSA Team should have requested police statements for the fatal collisions to be thorough.

The report again makes some emphasis on previously raised Problems but does not link these to the recorded collisions.

2.3.3 Unclear Recommendations

One of the report uses the same Recommendation for five of the seven Problems identified therein and the remaining two are variations on the same theme. The repeated Recommendation is:

“It is recommended that this proposal is reviewed and a safer alternative is found to gain access to and from this area [for this activity] to be undertaken.”

Another report by the same supplier repeats the following Recommendation for three out its four Problems:

“It is recommended that this hazard is eliminated, as far as is practicable, so as to not adversely affect the risk of injury to vehicle occupants should a vehicle leave the carriageway at this location.

It is recognised that industry advice, including from Society of Road Safety Auditors, is that RSA Teams, to some degree, should avoid being too specific in their Recommendations to avoid encroaching into the area of ‘design’. However, Recommendations do need to be constructive and informative so as to help designers identify how best to address the Problems identified.

2.3.4 Response and Counter-Response

In one of the reviewed RSA reports, a review of the previous RSA repeats a previously raised Problem in full, together with the ‘Designer’s Response’ and then a counter-response by the RSA Team. This details a new issue related, but not identical to, the original Problem.

The review of the previous RSA also suggests that more than one Problem was identified but the RSA Team only refer to one which they Team considered unresolved. This section should also make reference to Problems resolved or excepted as detailed in the Annex F model report.

It is recognised that a detailed dissection of responses to previous RSA Problems might be included in subsequent RSA reports in the interests of completeness. However, it is not for RSA Teams to enter into a debate with designers about the suitability of proposed remedial measures.

HD19/15 is very clear that the post-RSA process is between the Design Team and the Project Sponsor and the example given in model Stage 2 RSA report in Annex F suggests that details of response and counter response is not required.

2.3.5 RSA Reports in PDF Format

Universally, PDF is the most commonly used format for submitted reports. Converting a report to PDF can reduce the likelihood of accidental or deliberate editing by other parties. However, it is evident that on some occasions reports get submitted as PDFs with, with graphical flaws.

One report reviewed this quarter had a Problem Location plan on which the background mapping had not been preserved in the PDF copy.
It is also recognised that, to reduce file-sizes, RSA report annexes sometimes get produced separately to the main body of the reports. This occasionally results in RSA reports being submitted to the SRDT Inbox without their annexes.

Care should be taken to ensure that, when submitted to the Inbox, RSAs have clear graphics and are inclusive of all annexes.

**2.3.6 Maintaining Agent Not Invited to Stage 3 RSA Site Visit**

Neither of the two Stage 3 RSAs reviewed refer to a Maintaining Agent representative being invited to the site visit in accordance with HD19/15 paragraph 2.93. It is recognised that HD19/15 does not include a model Stage 3 RSA report but best practice would be to ensure that the report details that both police and maintaining agent representatives had been invited in compliance with paragraph 2.93.

**2.3.7 Template Text**

The introduction of one of the sampled reports states:

“The Road Safety Audit has been undertaken at the request of xxx [sic], the Highways England Project Sponsor.”

A further phrase in the same RSA report suggests a possible copy and paste error resulting in an unclear and contradictory description of the site visit conditions.

“During the day time site visit the weather was mixed cloudy and sunny but dry giving a damp road surface”

Whilst using a report template seems sensible and efficient given the amount repeated or similar text from RSA to RSA, the examples shown above highlight a potential trip-fall of using template reports. Care should be taken by RSA Teams to ensure that variable text fields or placeholders are appropriately populated or changed with text appropriate to the RSA being written.
2.3.8 Curtailment of Site Visit

One Stage 1 RSA report states that the daylight site visit was curtailed due to a major incident on the motorway. A site visit in darkness was, instead, carried out. The site visit is described as taking half an hour.

The motorway section being audited was approximately nine miles in length between two junctions. Hence the half-hour site visit is likely to have comprised only a single drive-through in each direction (although the report introduction does not give this detail). It is not clear whether a site visit of this duration, in darkness, would be sufficient to adequately consider potential site-related issues for this scheme. It might have been better practice to cancel the visit and return on a future occasion when the motorway incident was cleared.
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 98 Problems or Recommendations 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 issue type (27 occurrences in total) relates to signs or markings being confusing or misleading. Of these:

- Ten related to lane direction/destination markings
- Six related to related to lane direction/destination signs
- Four related to lane lines

The second most prevalent issue (26 occurrences) relates to signs or markings being absent from the design or the built scheme where the RSA Team felt they would be beneficial. Of these:

- Six related to edge of carriageway markings
- Four related to lane direction/destination signs
- Three related to diversion signs

The sign or marking types (where specified) that feature most under various issues are lane destination signs (13) lane destination markings (11); direction signs (9); lane lines (8); edge of carriageway markings (7); and diversion signs (6)

Figure 3-1 overleaf details the sign types and issues in full and in matrix form.
### Figure 3-1  Signing and Lining Issues recorded this Quarter

<table>
<thead>
<tr>
<th>Issue Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence of signs</td>
<td>1</td>
</tr>
<tr>
<td>Clearway signs</td>
<td>1</td>
</tr>
<tr>
<td>Countdown signs</td>
<td>1</td>
</tr>
<tr>
<td>Direction signs</td>
<td>1</td>
</tr>
<tr>
<td>Diversion signs</td>
<td>1</td>
</tr>
<tr>
<td>Tourist destination signs</td>
<td>1</td>
</tr>
<tr>
<td>Edge of carriageway markings</td>
<td>1</td>
</tr>
<tr>
<td>Keep Left Signs</td>
<td>1</td>
</tr>
<tr>
<td>Lane direction/destination markings</td>
<td>10</td>
</tr>
<tr>
<td>Lane direction/destination signs</td>
<td>4</td>
</tr>
<tr>
<td>Lane lines</td>
<td>4</td>
</tr>
<tr>
<td>Chevron signs</td>
<td>1</td>
</tr>
<tr>
<td>Deflection arrow markings</td>
<td>1</td>
</tr>
<tr>
<td>Road studs</td>
<td>1</td>
</tr>
<tr>
<td>Access layout signs</td>
<td>2</td>
</tr>
<tr>
<td>NMU guidance markings</td>
<td>1</td>
</tr>
<tr>
<td>Access markings</td>
<td>1</td>
</tr>
<tr>
<td>No Right Turn signs</td>
<td>1</td>
</tr>
<tr>
<td>Shared Use signs</td>
<td>1</td>
</tr>
<tr>
<td>Signal STOP lines</td>
<td>1</td>
</tr>
<tr>
<td>SLOW markings (carriageway)</td>
<td>1</td>
</tr>
<tr>
<td>Speed limit signs</td>
<td>2</td>
</tr>
<tr>
<td>Staggered Crossroads signs</td>
<td>1</td>
</tr>
<tr>
<td>Residual temporary markings</td>
<td>1</td>
</tr>
<tr>
<td>Traffic signals</td>
<td>1</td>
</tr>
<tr>
<td>Turn Left signs</td>
<td>1</td>
</tr>
<tr>
<td>New Road/Junction/Layout temporary signs</td>
<td>1</td>
</tr>
<tr>
<td>Unspecified markings</td>
<td>1</td>
</tr>
<tr>
<td>Unspecified signs</td>
<td>1</td>
</tr>
</tbody>
</table>

**TOTALS:** 26 27 1 1 1 2 3 2 1 4 3 3 2 2 1 1 3 12 3 2
Appendix A

Quarterly Factsheet
1st January 2017 to 31st March 2017
Quarterly Factsheet - 1st January 2017 - 31st March 2017 (Rev. 2)

Basic Information

<table>
<thead>
<tr>
<th></th>
<th>This Quarter</th>
<th>Database Since Jan 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of RSAs submitted</td>
<td>223</td>
<td>1536</td>
</tr>
<tr>
<td>RSA Team Leader specifically identified</td>
<td>100%</td>
<td>94%</td>
</tr>
<tr>
<td>Project Sponsor specifically identified</td>
<td>90%</td>
<td>91%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>This Quarter</th>
<th>Database Since Jan 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of problems recorded</td>
<td>0.9</td>
<td>1.4</td>
</tr>
<tr>
<td>Response Report issued</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Exception Report issued</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

RSAs By Highways England Area - This Quarter

RSAs By Scale of Scheme - This Quarter

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

- Compliant
- Non-Compliant
- N/A

Charts marked by this symbol exclude data for Stage 4 RSAs as those compliances are not directly comparable

The inner ring shows this quarter

The outer ring shows the whole database since January 2014

- Inclusion of Certificate of Competency details is not mandatory

### Scheme description

- Compliant
- Non-Compliant

### Details of RSA Brief and CV approvals

- Compliant
- Non-Compliant

### Identified RSA Team membership

- Compliant
- Non-Compliant

### Required details of site visit in full

- Compliant
- Non-Compliant

### Specific road safety problems identified

- Compliant
- Non-Compliant

### Recommendations for actions

- Compliant
- Non-Compliant

### Marked up location map

- Compliant
- Non-Compliant

### RSA Team statement

- Compliant
- Non-Compliant

### List of documents and drawings reviewed

- Compliant
- Non-Compliant

### Items such as correspondence are NOT INCLUDED

- Compliant
- Non-Compliant

### Unrelated technical matters are NOT INCLUDED

- Compliant
- Non-Compliant

### Certificate of Competency details stated

- Stated
- Not Stated
- Pre Dec 13

The outer ring shows the whole database since January 2014