VOLUME 5 ASSESSMENT AND PREPARATION OF ROAD SCHEMES
SECTION 2 PREPARATION AND IMPLEMENTATION

Part 2

HD 19/15

ROAD SAFETY AUDIT

SUMMARY

This document provides the requirements for Road Safety Audit which are mandatory for all trunk road Highway Improvement Schemes including motorways. It describes the stages at which Road Safety Audit shall be carried out, the procedures to be followed and the requirement for road safety monitoring of Highway Improvement Schemes after opening. **HD 19/15** supersedes **HD 19/03** and **IAN 152/11** (and the other Overseeing Organisation documents **IAN 152/11 (W), DEM 136/11** and **TS Interim Amendment 40/11**).

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THE HIGHWAYS AGENCY

HD 19/15
Volume 5, Section 2, Part 2



TRANSPORT SCOTLAND



LLYWODRAETH CYMRU
WELSH GOVERNMENT



THE DEPARTMENT FOR REGIONAL DEVELOPMENT
NORTHERN IRELAND

Road Safety Audit

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1. INTRODUCTION

Background

1.1. The objective of this Standard is to ensure that the road safety implications of all Highway Improvement Schemes are fully considered for all users of the motorway and trunk road network. The application of the Standard to those working on the highway is covered in paragraph 2.17.

1.2. The Overseeing Organisations attach great importance to the improvement of road safety. The use of Standards that are based on road safety considerations help to ensure that this objective is met.

1.3. Many elements of a Highway Improvement Scheme design are based on the use of Design Standards and Advice Notes. Whilst these Standards and Advice Notes provide a basis for safe design, care has to be taken when combining elements from them to avoid the creation of potential hazards. However, it is important to note that Road Safety Audit is not exclusively concerned with those aspects that are associated with the interaction of Design Standards. The objective of Road Safety Audit is to identify aspects of a Highway Improvement Scheme that could give rise to road safety problems and to suggest modifications that would improve the road safety of the resultant scheme.

1.4. Although road safety has always been considered during scheme preparation, there have been instances where details of the design have contributed to collisions and/or incidents on newly opened schemes. Design Teams do not necessarily contain staff with Collision Investigation or Road Safety Engineering experience and consequently they may not foresee potential factors pertaining to collision causation.

1.5. The Road Safety Audit procedure has been developed to ensure that operational road safety experience is applied during the design and construction process in order that the number and severity of collisions is kept to a minimum. Road Safety Auditors identify and address problem areas using the experience gained from highway design, road safety engineering, collision analysis and road safety related research. The Overseeing Organisations' aim is that the monitoring of Road Safety Audited schemes will result in more informed designs, leading to schemes that rarely require road safety related changes after opening.

1.6. It is recommended that Design Teams include staff with Road Safety Engineering experience to ensure that road safety issues are considered during the design process. However, Road Safety Engineers included within the Design Team cannot be permitted to be part of the appointed Road Safety Audit Teams. This is because of a potential lack of independence from the scheme design as their views may be influenced by familiarity and a natural "pride of authorship". The involvement of a Road Safety Engineer within the Design Team is not considered to be an acceptable substitute for undertaking Road Safety Audit.

Scope of this Standard

1.7. This Standard sets out the procedures required to implement Road Safety Audit on Highway Improvement Schemes on trunk roads including motorways. It defines the relevant schemes and stages in the design and construction process at which Road Safety Audit shall be undertaken and sets out the requirements for post- implementation collision monitoring.

1.8. This document includes several significant changes from the previous Standard **HD 19/03 (DMRB 5.2.2)**. This document also incorporates the requirements and advice in the withdrawn **IAN 152/11, IAN 152/11(W), DEM 136/11** and **TS Interim Amendment 40/11**, which relates to **EC Directive 2008/96/EC** in respect to Road Safety Audit. The main changes in this Standard include:

- additional guidance on schemes to be Road Safety Audited;
- clarification of the process for the collision monitoring of completed Highway Improvement Schemes in the form of Stage 4 Road Safety Audit;
- further information on the application of Road Safety Audit for developer-led schemes;
- inclusion of the Road Safety Auditor Certificate of Competency requirements;
- additional guidance on the preparation of the Road Safety Audit Brief;
- inclusion of the Road Safety Audit Response Report and guidance on its preparation; and
- additional guidance on the preparation of the Road Safety Audit Exception Report.

Mandatory Sections

1.9. Mandatory sections of this document are contained in boxes. The organisations involved in the Road Safety Audit process must comply with these sections or obtain agreement to a Departure from Standard from the Overseeing Organisation. The remainder of the document contains advice and explanation, which is commended to users for consideration.

Application in Northern Ireland

1.10. This Standard will apply to those roads designated by the Overseeing Organisation.

Superseded Documents

1.11. This Standard supersedes **HD 19/03 (DMRB 5.2.2)**, which is hereby withdrawn. The contents of this Standard also supersede **IAN 152/11, IAN 152/11 (W), DEM 136/11** and **TS Interim Amendment 40/11**.

Implementation

1.12. This Standard shall be used forthwith for all Road Safety Audits on all Highway Improvement Schemes with the exception of Road Safety Audits for which a Road Safety Audit Brief in accordance with HD 19/03 has been issued before the publication date of **HD 19/15**. Those Road Safety Audits may be completed in accordance with **HD 19/03**.

1.13. Exemptions granted under paragraph 2.6 of **HD 19/03** prior to the publication of this Standard are recognised as valid. However, where this previous exemption only refers to a stage of the Road Safety Audit process, any stages of the process subsequent to the exemption must follow the requirements of this Standard.

Definitions

1.14. **Collision Investigation:** The collection and examination of historical collision data over a period of time in order to identify common trends and factors which may have contributed to the collisions. This could also include the detailed forensic investigation of single collisions.

1.15. **Design Organisation:** The organisation(s) commissioned to undertake the various phases of scheme preparation.

1.16. **Design Team:** The group within the Design Organisation undertaking the various phases of scheme preparation.

1.17. **Design Team Leader:** A person within the Design Team responsible for managing the scheme design and co-ordinating the input of the various design disciplines.

1.18. **Director:** The Director in the Overseeing Organisation with overall responsibility for the Highway Improvement Scheme. The Director will make the final decision in respect of the acceptance of any Exception Reports produced (see Annex L). For Transport Scotland, the term Director shall mean the Chief Road Engineer. For the Welsh Government, the term Director shall mean the Chief Highway Engineer. For the Department for Regional Development Northern Ireland, the term Director shall mean the Director of Engineering.

1.19. **Exception Report:** A report from the Project Sponsor to the Director on each recommendation in the Road Safety Audit Report that the Project Sponsor proposes should not be implemented. (See paragraphs 3.7 to 3.14 and Annex L).

1.20. **Highway Improvement Schemes:** All works that involve construction of new highway or permanent change to the existing highway layout or features. This includes changes to road layout, kerbs, signs and road markings, lighting, signalling, drainage, landscaping, communications cabinets and the installation of roadside equipment. The term "Highway Improvement Scheme" is considered to include the **EC Directive 2008/96/EC** term "Infrastructure Project".

1.21. **Interim Road Safety Audit:** The application of Road Safety Audit to the whole or part of a Highway Improvement Scheme at any time during its design and construction. Interim Road Safety Audit is neither mandatory nor a substitute for the Stage 1, 2 and 3 Road Safety Audits.

1.22. **Like-for-like Maintenance Scheme:** A scheme or highway feature proposed as maintenance works, that solely involves the replacement or refurbishment of a highway feature with a corresponding feature, which as a minimum, will appear the same, be located in the same position, perform the same and be constructed of comparable materials as the feature it replaces.

1.23. **Non-Motorised Users (NMUs):** NMUs are considered to be pedestrians, cyclists and equestrians. The term NMU also includes disabled people and wheelchair users.

1.24. **Overseeing Organisation:** The highway or road authority responsible for the motorway or trunk road Highway Improvement Scheme to be Road Safety Audited, or in the case of developer-led or third party organisation promoted schemes, the highway or road authority responsible for the motorway or trunk road affected by the proposed Highway Improvement Scheme.

1.25. **Overseeing Organisation Specialist:** A person from the Overseeing Organisation that has the appropriate training, skills and experience in the Road Safety discipline. For the Highways Agency this will be an appropriate person from the Safer Roads – Design Team. For the Welsh Government this would be a specialist within the Network Management Division of the Transport Department. For the Department for Regional Development Northern Ireland this will be the Road Safety Engineering Policy Manager and for Transport Scotland this will be the Head of Standards.

1.26. **Project Sponsor/Project Manager:** A person from the Overseeing Organisation responsible for ensuring the progression of a scheme in accordance with the policy and procedures of the Overseeing Organisation, and ensuring compliance with the requirements of this Standard. It should be noted that the Project Sponsor may not always be from the same organisation as those promoting the scheme, as the scheme may be proposed by a third party organisation (see paragraph 1.40).

1.27. **Road Safety Audit:** The evaluation of Highway Improvement Schemes during design and at the end of construction (preferably before the scheme is open to traffic). The aim is to identify potential road safety problems that may affect any users of the highway and to suggest measures to eliminate or mitigate those problems. The Road Safety Audit process includes the collision monitoring of Highway Improvement Schemes to identify any road safety problems that may occur after opening. The Stage 4 Road Safety Audit will include the analysis and reporting of 12 and 36 months of personal injury collision data from when the scheme became operational.

1.28. **Road Safety Audit Brief:** The instructions to the Road Safety Audit Team defining the scope and details of the Highway Improvement Scheme to be Road Safety Audited, including sufficient information for the Road Safety Audit to be undertaken (see Annex E).

1.29. **Road Safety Audit Report:** The report produced by the Road Safety Audit Team describing the road safety related problems identified by the Road Safety Audit Team and the recommended solutions to those problems.

1.30. **Road Safety Audit Response Report:** A report produced by the Design Team following Road Safety Audit Stages 1, 2 and 3 in which the Design Team responds to the problems and recommendations raised in the Road Safety Audit Report. The Road Safety Audit Response Report (see Annex K) will assist the Project Sponsor when deciding on the need to produce an Exception Report (see Annex L).

1.31. **Road Safety Audit Site Visit:** a visit to the location of a proposed or completed Highway Improvement Scheme.

1.32. **Road Safety Audit Team:** A team that works together on all aspects of the Road Safety Audit, independent of the Design Team and approved for a particular Road Safety Audit by the Project Sponsor on behalf of the Overseeing Organisation. The Road Safety Audit Team shall comprise a minimum of two persons (a Team Leader and Team Member). The individuals within the Road Safety Audit Team may be drawn from the Design Organisation or from other organisations.

1.33. **Road Safety Audit Team Leader:** A person with the appropriate training, skills and experience who is approved for a particular Road Safety Audit by the Project Sponsor on behalf of the Overseeing Organisation. The Road Safety Audit Team Leader has overall responsibility for carrying out the Road Safety Audit and managing the Road Safety Audit Team.

1.34. **Road Safety Audit Team Member:** A member of the Road Safety Audit Team with the appropriate training, skills and experience necessary for the Road Safety Audit of a specific scheme, reporting to the Road Safety Audit Team Leader.

1.35. **Road Safety Audit Team Observer:** A person with the appropriate training, skills and experience accompanying the Road Safety Audit Team to observe and gain experience of the Road Safety Audit process. The Road Safety Audit Team Observer is encouraged to contribute actively to the Road Safety Audit process.

1.36. **Road Safety Engineering:** The design and implementation of Highway Improvement Schemes intended to reduce the number and severity of collisions involving road users, drawing on the results of Collision Investigations.

1.37. **Road Safety Matters:** Any element of the road environment that could potentially contribute to a Road Traffic Collision or incident. The definition of Road Safety Matters also includes features that could present an unacceptable risk of trips, slips or falls to road users.

1.38. **Road Traffic Collision:** A collision between road users or between a road user and a feature on or adjacent to the highway.

1.39. **Specialist Advisor:** A person approved by the Project Sponsor to provide specialist independent advice to the Road Safety Audit Team, should the scheme include complex features outside the experience of the Road Safety Audit Team Members, e.g. a complex traffic signal controlled junction (see paragraph 2.85).

1.40. **Third Party Organisations:** Organisations such as a developer, a developer's consultant, a local authority, Statutory Undertaker or other private organisation that could be promoting a Highway Improvement Scheme on the Overseeing Organisation's road network.

2. ROAD SAFETY AUDIT

Schemes to be Road Safety Audited

2.1. This Standard shall apply to all Highway Improvement Schemes (see paragraph 1.20) on trunk roads including motorways, regardless of procurement method. This includes work carried out under agreement with the Overseeing Organisation resulting from developments alongside or affecting the trunk road or Highway Improvement Schemes being promoted by third party organisations.

2.2. Highway Improvement Schemes that will not impact on road user behaviour or adversely change the outcome of an incident involving an errant vehicle, due to the nature of the works and/or the distance of the improvement from the operational highway may, in certain circumstances be excluded from the Road Safety Audit process without the need for a formal Departure from Standard application (see paragraph 2.10). In such situations, Project Sponsors must formally consult with Overseeing Organisation Specialists at an early stage and gain agreement from the Specialist that the Road Safety Audit process does not need to be applied to the Highway Improvement Scheme.

2.3. The Project Sponsor must formally record on their scheme file (or equivalent) any decision not to apply Road Safety Audit to a scheme that they consider will not impact on road safety. If the Overseeing Organisation Specialist does not formally agree that the scheme may be excluded from the Road Safety Audit process and the Project Sponsor still considers the Road Safety Audit unnecessary, then the Departure from Standard process must be applied in accordance with paragraph 2.10 of this Standard.

2.4. Like-for-like maintenance schemes are excluded from Road Safety Audit (see paragraph 1.22). However, Project Sponsor's and Designer's attention is drawn to paragraph 2.6 of this Standard. This Standard does apply to Highway Improvement Schemes that are constructed as part of the same procurement package as maintenance works.

2.5. When considering whether a scheme is a like-for-like maintenance scheme, the Project Sponsor must consider if the works may change road user behaviour or adversely change the outcome of an incident involving an errant vehicle. If the feature could potentially change road user behaviour or its presence could exacerbate the severity of a collision then the Road Safety Audit process detailed in this Standard must be applied. If a Project Sponsor is unsure if the scheme under consideration could impact on road user behaviour or change the outcome of an incident involving an errant vehicle, they must formally consult with an appropriate Specialist from the Overseeing Organisation.

2.6. Project Sponsors and Designers should ensure that any like-for-like replacement or refurbishment scheme does not reinstate a feature that is known by the Overseeing Organisation or Design Organisation to adversely affect road user safety (e.g. the replacement of a non-passively safe traffic sign in the same location where it has been previously struck by errant road users on numerous occasions).

Delegation

2.7. The Overseeing Organisation will decide on the extent of delegation of the Director's and Project Sponsor's responsibilities, duties and tasks, with respect to this Standard. Project Sponsors may delegate to an assistant within the Overseeing Organisation. The Project Sponsor is responsible for ensuring that the assistant is competent to carry out the responsibilities, duties and tasks delegated. Project Sponsors may also delegate to a supplier employed as a "Department's Representative" provided they are independent from the design, construction and Road Safety Auditor organisations and the individuals appointed are competent to undertake the role. If a Project Sponsor or Director is unsure if the individual they are intending to delegate to is competent and independent, they should formally consult with an appropriate Specialist from the Overseeing Organisation.

2.8. The Project Sponsor must inform the Road Safety Audit Team Leader and Design Team Leader in writing of any such delegations.

Application to Temporary Traffic Management Schemes

2.9. This Standard is not generally required for application to temporary traffic management schemes. The Department for Transport publication "Safety at Street Works and Road Works A Code of Practice" and Chapter 8 of the Traffic Signs Manual contain the necessary guidance to facilitate the safe planning and implementation of temporary traffic management activities. However, Road Safety Audit should be applied to exceptional temporary traffic management schemes that involve temporary changes to the layout and operation of junctions or realignment of roads that will affect the network for a considerable period. Examples of such schemes include installation of a temporary roundabout junction or a diversion using a length of temporary carriageway to allow major excavation on a main carriageway. If a Project Sponsor is unsure if the scheme under consideration should be subjected to Road Safety Audit, they should formally consult with an appropriate Specialist from the Overseeing Organisation.

Exemption

2.10. Where the Project Sponsor considers it unnecessary for Road Safety Audit to be applied to a particular Highway Improvement Scheme and the scheme in question has not been excluded from Road Safety Audit in accordance with paragraph 2.2 or paragraph 2.49 of this Standard, approval for a Departure from Standard must be obtained from the Overseeing Organisation. The Departure application must clearly state why a Road Safety Audit is not considered necessary.

2.11. A Departure from Standard allowing exemption from Road Safety Audit will only be approved when, in the opinion of the Overseeing Organisation, the effect of the Highway Improvement Scheme on the highway would be negligible and the costs and safety risks of undertaking the Road Safety Audit would outweigh its benefits.

The Relationship between Road Safety Audit and Health & Safety Legislation

2.12. Road Safety Audit does not cover health & safety legislation issues concerning the construction, maintenance and use of the road.

2.13. Although the Road Safety Audit Team's contribution to design is limited, in making recommendations they may be considered to have undertaken design work under health & safety legislation. It is therefore recommended that Road Safety Audit Teams make themselves aware of current health & safety legislation and consider the implications of their recommendations for the health & safety of others.

2.14. Overseeing Organisation Project Sponsors and Directors should make themselves aware of current health & safety legislation and consider the implications of their instructions to Design Teams and Road Safety Audit Teams in terms of health & safety.

2.15. When incorporating Road Safety Audit recommendations into scheme designs (see paragraph 3.15), the Design Team shall be responsible for reviewing and amending any design risk assessments required by health & safety legislation. The Design Team must also consider the impact that incorporating Road Safety Audit recommendations could have on other design elements.

Scope of Road Safety Audit

2.16. Road Safety Audit shall only consider Road Safety Matters (see paragraph 1.37).

2.17. Issues relating to the health & safety of operatives constructing, operating or maintaining the highway are not covered by Road Safety Audit. Only issues relating to the design and construction of facilities for highway maintenance that may potentially contribute to a Road Safety Matter (see Paragraph 1.37) should be considered by the Road Safety Audit process.

2.18. Road Safety Audit is not a technical check that the design conforms to Standards and/or best practice guidance. Design Organisations are responsible for ensuring that their designs have been subjected to the appropriate design reviews (including, where applicable, Non-Motorised User (NMU) Audits **HD 42/05 "Non-Motorised User Audits" (DMRB 5.2.5))** prior to Road Safety Audit.

2.19. Road Safety Audit is not a check that the scheme has been constructed in accordance with the design.

2.20. Road Safety Audit does not consider structural safety.

Road Safety Audit

2.21. When making recommendations for dealing with identified problems, Road Safety Audit Teams must make allowance for the fact that strategic decisions on matters such as route choice, junction type, standard of provision and approved Departures from Standards already reflect an appropriate balance of a number of factors including road safety. Recommendations requiring major changes in these areas are unlikely to be acceptable when balanced with other aspects of the scheme and the Road Safety Audit Team must not make such proposals. In the unlikely situation where the road safety implications of the strategic decisions have not been fully considered previously, the Project Sponsor may extend the scope of the Road Safety Audit to include consideration of these items. The Project Sponsor must clearly identify within the Road Safety Audit Brief where the scope of the Road Safety Audit has been extended to cover strategic decisions.

2.22. Where the Project Sponsor has extended the scope of the Road Safety Audit to include strategic decisions in the Road Safety Audit Brief, it should be noted that the Road Safety Audit Team's recommended changes to the strategic elements of the design may not be accepted by the Project Sponsor and the Designer's original scheme layout as detailed in the Road Safety Audit Brief may be progressed. Therefore, when Road Safety Auditors are permitted to consider strategic elements of a Highway Improvement Scheme and they make recommendations for changes to the strategic decisions, the Road Safety Audit Team must also ensure that they fully assess the original layout as proposed by the Design Team so that any road safety problems are identified and addressed.

2.23. Advice is given on the general aspects that should be addressed at Road Safety Audit Stages 1, 2 and 3 in the lists in Annexes A to C of this Standard. An illustrative Stage 2 Road Safety Audit Report is shown in Annex F and illustrative Stage 4 Road Safety Audit Reports are contained in Annexes G and H.

2.24. The lists in Annexes A, B and C are not intended to be exhaustive. They provide a prompt for optional supplementary checks that Road Safety Audit Teams could make following their less prescriptive and more wide-ranging Road Safety Audit.

2.25. Road Safety Auditors must examine the overall layout of the Highway Improvement Scheme. All users of the highway shall be considered including motorists, pedestrians, cyclists, equestrians and facilities for those working on the highway (see paragraph 2.17). Particular attention should be given to vulnerable road users such as the very young, older users and the mobility and visually impaired.

2.26. The potential for road safety problems is often greatest at junctions, tie-ins and immediately beyond tie-ins. Where a Highway Improvement Scheme joins an existing road or junction, inconsistency in the standard of provision may potentially lead to collisions, so particular attention should be paid to these areas to ensure the safest possible transition is achieved. This applies particularly to on-line improvements where variations in the standard of provision between new and existing sections may not be obvious to the road user.

Stages of Road Safety Audit

2.27. Highway Improvement Schemes shall be Road Safety Audited at Stages 1, 2, 3 and 4. If, for any reason, a Stage 1 Road Safety Audit has not been carried out (for example, where a scheme is of such a scale that no preliminary design has been necessary and the scheme has progressed directly to detailed design with the agreement of the Project Sponsor), Road Safety Audit Stages 1 and 2 shall be combined at Stage 2 and shall be referred to as a Combined Stage 1 & 2 Audit. The information provided as part of the Road Safety Audit Brief for a Combined Stage 1 & 2 Road Safety Audit must be of sufficient detail to undertake a detailed design Road Safety Audit (see paragraph 2.33).

2.28. Stage 1 and Stage 2 Road Safety Audits must not be combined as purely a cost and/or programme saving measure.

Stage 1 Road Safety Audit: Completion of Preliminary Design

2.29. Stage 1 Road Safety Audits will be undertaken at the completion of preliminary design, (for example at the Order Publication Report Stage) before publication of draft Orders and for developer-led Highway Improvement Schemes, before planning consent is applied for (see paragraphs 2.54 to 2.61).

2.30. The end of the preliminary design stage is often the last occasion at which land requirements may be changed. It is therefore essential that Stage 1 Road Safety Audits considers any road safety issues which may have a bearing upon land take, licence or easement before the draft Orders are published or planning consent is applied for.

2.31. At Road Safety Audit Stage 1 all Road Safety Audit Team members must visit together the sites of Highway Improvement Schemes:

- that involve permanent change to the existing highway layout or features; and
- where new offline proposals tie-in to the existing highway.

2.32. The need to consider the site during specific traffic conditions at the Stage 1 Road Safety Audit should be identified in the Road Safety Audit Brief (see paragraph 2.89h).

Stage 2 Road Safety Audit: Completion of Detailed Design

2.33. Stage 2 Road Safety Audits will be undertaken at the completion of the detailed design stage. At this stage, the Road Safety Audit Team is concerned with the more detailed aspects of the Highway Improvement Scheme. The Road Safety Audit Team will be able to consider geometry (such as the layout of junctions and highway cross sections), street furniture (such as the position of traffic signs and road restraint systems), carriageway markings, street lighting provision and other issues (see Annex B).

2.34. The Stage 2 Road Safety Audit should include a review of the issues raised in the Stage 1 Road Safety Audit Report. Any issues that have not been satisfactorily resolved from the Stage 1 Road Safety Audit either by the element of the scheme being redesigned, as a result of clarification given by the provision of further information or by an approved Exception Report, should be reiterated in the Stage 2 Road Safety Audit Report.

2.35. At Road Safety Audit Stage 2 all team members must visit together the sites of Highway Improvement Schemes:

- that involve permanent change to the existing highway layout or features; and
- where new offline proposals tie-in to the existing highway.

2.36. The need to consider the site during specific traffic conditions at the Stage 2 Road Safety Audit should be identified in the Road Safety Audit Brief (see paragraph 2.89h).

Stage 3 Road Safety Audit: Completion of Construction

2.37. The Stage 3 Road Safety Audit should be undertaken when the Highway Improvement Scheme is substantially complete and preferably before the works are opened to road users. This is to minimise potential risk to road users and the difficulty that would be experienced by Road Safety Audit Teams in traversing the site when open to traffic. Where this is not feasible, alternative arrangements should be agreed with the Project Sponsor. This may result in the Road Safety Audit being carried out a short time after opening or in phases where a scheme is subject to phased completion and opening. However, all Highway Improvement Schemes should be subjected to a Stage 3 Road Safety Audit within 1 month of opening. If there is an accessibility issue that restricts the Road Safety Audit Team from fully traversing areas of the site (e.g. an area of live motorway that cannot be accessed on foot), reference to this should be included in the introduction of the Road Safety Audit Report for consideration by the Project Sponsor.

2.38. Road Safety Auditors are required to examine the Highway Improvement Scheme from all users' viewpoints and may decide to drive, walk and/or cycle through the scheme as well as consider motorcycle and equestrian use to assist their evaluation and ensure they have a comprehensive understanding. Issues raised in the Stage 2 or Combined Stage 1 & 2 Road Safety Audit Report should also be reviewed at the Stage 3 Road Safety Audit and reiterated if not satisfactorily resolved, either by the element of the scheme being redesigned, as a result of clarification given by the provision of further information or by an approved Exception Report.

2.39. All Road Safety Audit Team Members must examine the scheme site together during daylight. They shall also examine the site together during the hours of darkness at Stage 3 so that hazards particular to night operation can be identified.

2.40. The Road Safety Audit Team should also consider the potential impact on road safety of different traffic conditions which may be specific to the Highway Improvement Scheme location. For example at peak periods, the beginning or end of the school day or during frequent events. The need to consider the site during specific traffic conditions should be identified in the Road Safety Audit Brief (see paragraph 2.89h).

2.41. Road Safety Auditors should also consider the potential impacts on road safety of various weather conditions that may not be present at the time of inspection.

2.42. The Road Safety Audit Team Leader should discuss any alterations recommended at the Stage 3 Road Safety Audit with the Project Sponsor as soon as possible to give the opportunity for modifications to be undertaken before opening. This will provide a safer working environment for the workforce and delays to road users will be minimised.

Stage 4 Road Safety Audit: Monitoring

2.43. The Overseeing Organisation will arrange for evidence led collision monitoring of Road Safety Audited Highway Improvement Schemes. Stage 4 Road Safety Audits should be undertaken by individuals with the appropriate training, skills and experience as identified in paragraphs 2.76 to 2.84 of this Standard.

2.44. When a Highway Improvement Scheme is opened to road users, monitoring in the form of Stage 4 Road Safety Audits must be carried out on the number of personal injury collisions that occur, so that any road safety problems can be identified and remedial action taken as soon as possible.

2.45. Stage 4 Road Safety Audit collision monitoring reports shall be prepared using 12 months and 36 months of personal injury collision data from the time the Highway Improvement Scheme became operational and shall be submitted to the Overseeing Organisation. The Stage 4 Road Safety Audit process is an evidence led review of personal injury collisions that have occurred in the vicinity of the Highway Improvement scheme. The collision records shall be analysed in detail to identify:

- locations at which personal injury collisions have occurred; and
- personal injury collisions that appear to arise from similar causes or show common factors.

2.46. When considering the timing of the 12 month and 36 month Stage 4 Road Safety Audits, allowance should be made for any significant changes that may have been implemented as a result of the Stage 3 Road Safety Audit. In the case where there have been significant changes following the period the scheme first became operational, then the 12 month and 36 month reports should make reference to these changes and their potential impact on the personal injury collision history.

2.47. The analysis of personal injury collision data should include identification of changes in the collision population in terms of number, rate (taking account of any traffic flow changes), types and other collision variables, comparisons should be made with control data. Where the Highway Improvement Scheme is an on-line improvement then the collision record before the scheme was built should be compared with the situation after opening. The collision data should be analysed to identify the influence of problems and recommendations identified at previous Road Safety Audit stages, and any Exception Reports.

2.48. If collision records are not sufficiently comprehensive for detailed analysis, the Police should be contacted to ascertain the availability of statements and report forms, which could aid the 12 month and 36 month data analysis.

2.49. Where no personal injury collisions have been recorded in the vicinity of the Highway Improvement Scheme over the 12 month or 36 month periods, a formal Stage 4 Road Safety Audit collision monitoring report is not required. If, for the above reason, the Project Sponsor decides not to proceed with the Stage 4 Road Safety Audit collision monitoring report, then this decision must be formally recorded, with appropriate reasoning, on their Highway Improvement Scheme file (or equivalent).

2.50. At Road Safety Audit Stage 4 all Road Safety Audit Team members must visit together the sites of Highway Improvement Schemes:

- where higher than expected numbers of personal injury collisions have occurred since the scheme became operational (when compared to control data); or
- where the personal injury collision rate or severity has increased since the scheme became operational; or
- where characteristics within the personal injury collision data post-opening show unexpected common trends (e.g. a high frequency of personal injury collisions during the hours of darkness or on a wet road surface).

2.51. When a site visit is undertaken (for the reasons identified in paragraph 2.50), the Road Safety Audit Team should consider if the personal injury collision analysis justifies an inspection during a particular time period (e.g. the hours of darkness or peak hour).

2.52. The Stage 4 Road Safety Audit collision monitoring report should identify any road safety problems indicated by the collision data analysis and any related observations during any site visits undertaken. The report should make recommendations for remedial action as appropriate.

2.53. Illustrative Stage 4 Road Safety Audit Reports examining 12 months and 36 months of collision data are contained in Annexes G and H respectively.

Developer-led and Third Party Organisation-led Schemes

2.54. The design and Road Safety Audit process for developer-led and third party organisation-led Highway Improvement Schemes can vary from the process for Overseeing Organisation promoted Highway Improvement Schemes. Most significantly, the scheme may be designed by an organisation working for the developer or third party organisation rather than an organisation working for the Overseeing Organisation. The developer-led scheme will be submitted for planning approval to the local planning authority and, where there are highway implications, the highway or road authority will be consulted. The following paragraphs provide additional requirements and guidance for all organisations involved in the Road Safety Audit of developer-led and third party organisation led Highway Improvement Schemes.

2.55. Where developer-led schemes or third party organisation-led schemes will result in Highway Improvements Schemes (as defined in paragraph 1.20) on the motorway and trunk road network, the contents of this Standard must be followed for all Stages of Road Safety Audit.

2.56. The Road Safety Audit Team approval and appointment must follow the process set out in paragraphs 2.70 to 2.75 of this Standard. As with highway or road authority promoted schemes, the Overseeing Organisation responsible for the affected motorway or trunk road is responsible for ensuring that the developer-led or third party scheme complies with the Road Safety Audit procedure as detailed in this Standard.

2.57. A Road Safety Audit Brief must be prepared and issued in accordance with paragraphs 2.87 and 2.88 of this Standard for all Road Safety Audit Stages (see Annex E).

2.58. A Stage 1 Road Safety Audit (or combined Stage 1 & 2 Road Safety Audit where there has been no preliminary design) must be undertaken before planning consent is applied for.

2.59. The process of issuing and considering the draft Road Safety Audit Report identified in paragraphs 2.102 to 2.106 of this Standard must be followed for both developer-led and third party led schemes for all Road Safety Audit Stages. Once the Road Safety Audit Report has been finalised, the scheme Designer is responsible for producing a Road Safety Audit Response Report in accordance with paragraphs 3.1 and 3.2 of this Standard.

2.60. At all Road Safety Audit Stages, recommendations made in the Road Safety Audit Report that impact on the motorway or trunk road network must be either incorporated into the design, included within the constructed scheme or dealt with by means of Exception Report(s) to the satisfaction of the Overseeing Organisation Project Sponsor and Director. In the case of the Stage 1 Road Safety Audit Report (or combined Stage 1 & 2 Road Safety Audit Report), recommendations must be accommodated or Exceptions Reports produced to the satisfaction of the Overseeing Organisation Project Sponsor and Director prior to planning consent being given.

2.61. At all stages the Project Sponsor is responsible for the production of any Exception Reports. Typically the Project Sponsor will request that the developer or third party organisation produces the Exception Report(s) on their behalf. The Exception Report(s) must be produced to the satisfaction of the Overseeing Organisation's Project Sponsor and Director, for elements of the scheme on the motorway or trunk road network. The Exceptions Report(s) must be agreed with the Overseeing Organisation's Project Sponsor and Director prior to the scheme progressing to the next stage.

Design Changes and Road Safety Audit Shelf Life

2.62. Stage 1, Combined Stage 1 & 2 and Stage 2 Road Safety Audits must be repeated if the scheme design materially changes, if there are many minor changes which could together impact on road user safety, or if the previous finalised Road Safety Audit for the relevant stage is more than 5 years old. In the case of minor changes to a Highway Improvement Scheme then the repeated Road Safety Audit should only be concerned with the elements of the scheme that have been changed. If the changes are more significant or if there are many minor changes then the whole Road Safety Audit stage should be repeated.

2.63. Throughout the period following the Stage 2 Road Safety Audit, the Design Organisation and/or Contractor must keep the Project Sponsor informed of all design changes that occur so that any requirement for an additional Stage 2 Road Safety Audit can be identified. The Project Sponsor must then initiate any additional Road Safety Audits required.

Interim Road Safety Audit

2.64. The requirement for independence need not prevent contact between the Design Team and the Road Safety Audit Team throughout the design and construction process, provided certain conditions are met (see paragraph 2.68). The Interim Road Safety Audit process can provide the benefit of early identification of potential road safety problems leading to savings in both programme and design costs. This could be particularly beneficial to larger projects with accelerated programmes, such as Highway Improvement Schemes involving early contractor involvement.

2.65. The Project Sponsor will decide whether to employ Interim Road Safety Audit. Design Teams must not contact Road Safety Audit Teams without the Project Sponsor's prior written authorisation. Road Safety Audit Teams undertaking Interim Road Safety Audit must only be appointed with the approval of the Project Sponsor in accordance with paragraphs 2.70 to 2.75 of this Standard.

2.66. Subject to the Project Sponsor's prior agreement, at any time during the preliminary and detailed design stages, Designers may submit or be instructed to submit designs of the whole or parts of schemes to the Road Safety Audit Team for completion of an Interim Road Safety Audit. The Road Safety Audit Team and Design Team are permitted to meet if considered necessary, to enable the Design Team to explain their designs and the Road Safety Audit Team to explain any identified problems and recommendations. This meeting should be chaired by the Project Sponsor.

2.67. In addition, Interim Road Safety Audit may be employed during the construction process with the agreement of the Project Sponsor. Elements of the constructed scheme may be subjected to Interim Road Safety Audit, when works are partially complete or when individual elements or sections of the scheme are complete and opened to road users in stages.

2.68. Interim Road Safety Audit is subject to the following conditions:

- Road Safety Audit Teams must report in the format illustrated in the Road Safety Audit Report in Annex F, namely the "problem/recommendation" format, unless instructed differently by the Project Sponsor in writing.
- Road Safety Audit Teams must limit their reports to matters within the scope of this Standard.
- Minutes of meetings must be recorded.
- All communications between the Road Safety Audit and Design Teams including design submissions, Interim Road Safety Audit Reports and minutes of meetings must be submitted to the Project Sponsor.
- Interim Road Safety Audit supplements the Road Safety Audits at Stages 1, 2, 3 and 4, therefore these Stage 1, 2, 3 and 4 Road Safety Audits must also be carried out and reported.

2.69. The Road Safety Audit Team will require a Road Safety Audit Brief for an Interim Road Safety Audit. This should contain as many of the items given in paragraph 2.89 as are available.

Road Safety Audit Team Approval and Appointment

2.70. Responsibility for the appointment of the Road Safety Audit Team at all stages will vary according to the procurement method for the scheme. Reference should be made to the scheme contract documents or the Overseeing Organisation for each scheme. If it is considered appropriate, the Project Sponsor may ask the Design Organisation to propose a Road Safety Audit Team for approval.

2.71. It is a fundamental principle of the Road Safety Auditing process that the Road Safety Audit Team is independent from the Design Team (see paragraph 1.6). The Project Sponsor must not accept a Road Safety Audit Team where its independence from the Design Team is in doubt. In such cases, an alternative Road Safety Audit Team must be proposed.

2.72. At Road Safety Audit Stages 1, 2, 3 and 4 the Road Safety Audit Team must comprise the Audit Team Leader and at least one Audit Team Member. This enables discussion between the Road Safety Auditors of the problems and recommendations and maximises the potential to identify problems. Road Safety Audit Team Observers may also join the Road Safety Audit Team to gain experience in carrying out Road Safety Audit. However, the number of Road Safety Audit Team Observers shall be limited to a maximum of two.

2.73. The Road Safety Audit Team must satisfy the Project Sponsor of their competence to undertake the Road Safety Audit. Members of the Road Safety Audit Team must demonstrate their competence by means of a road safety specific curriculum vitae. The information provided in the curriculum vitae must concisely set out how the proposed Road Safety Audit Team member's training, skills and experience (including Continuing Professional Development) align with the guidance and requirements of this Standard. Approvals of the Road Safety Audit Team are scheme specific and the use of personnel or organisations on previous Road Safety Audit work does not guarantee their suitability to Road Safety Audit other schemes. Experience must be relevant to the type of scheme being Road Safety Audited and this relevant experience must be identified in the proposed Road Safety Audit Team members' curriculum vitae.

2.74. At all Road Safety Audit stages the Project Sponsor is responsible for approving the Road Safety Audit Brief which shall be issued to the Road Safety Audit Team.

2.75. It is not necessary for the same Road Safety Audit Team to undertake all Road Safety Audit stages of a scheme, however, any changes to a Road Safety Audit Team and its individual members will require further approval from the Project Sponsor.

Road Safety Audit Team Training, Skills and Experience

2.76. Paragraphs 2.77 to 2.84 include guidance on the general levels of training, skills and experience that are expected of Road Safety Auditors. Most are not mandatory requirements but are intended to assist Project Sponsors when considering proposals for Road Safety Audit Teams and also to assist potential auditors to prepare themselves as candidates for Road Safety Audit Teams. The guidance is intended to be flexible, recognising that the experienced road safety professionals that are needed to carry out Road Safety Audits may have developed their careers from a range of backgrounds.

2.77. The most appropriate candidates for Audit Team Leader and Audit Team Member are individuals whose recent experience involves Collision Investigation or Road Safety Engineering on a regular basis. This should ensure that Road Safety Auditors are well versed in the most recent practices and developments in the field. Those candidates who have the recommended experience in Collision Investigation or Road Safety Engineering experience, but who have not undertaken such work on a regular basis in the previous 2 years, are unlikely to be acceptable, due to their lack of current relevant experience.

2.78. Candidates who carry out Road Safety Audits full time, to the exclusion of Collision Investigation or Road Safety Engineering work are unlikely to be acceptable as they may lack the appropriate and recent Collision Investigation or Road Safety Engineering experience.

2.79. Road Safety Auditors should also have an understanding of how best practice highway design principles may benefit road safety. It is not intended that Road Safety Auditors have extensive detailed design knowledge. However, they should have a reasonable understanding of design Standards and best practice design principles, and how the application of these can minimise collision risk.

2.80. The Continuing Professional Development (CPD) record included in the curriculum vitae must focus on Road Safety Audit, Collision Investigation and Road Safety Engineering. It shall include any other relevant CPD, covering areas such as highway design, traffic management and highway maintenance.

2.81. It should be noted that relevant CPD does not have to take the form of formal training courses alone. Outcome based structured reading, the preparation and presenting of relevant material and work based learning can all form part of a CPD record. Examples of what constitutes CPD can be found in places such as the Engineering Council (ECUK) web site.

2.82. Road Safety Audit Teams comprised of highway design engineers with little or no experience of road safety work are not acceptable.

2.83. The following list gives guidelines on acceptable training, skills and experience for Road Safety Audit Team Members:

- **Road Safety Audit Team Leader:** A minimum of 4 years Collision Investigation or Road Safety Engineering experience. Completion of at least 5 Road Safety Audits in the past 12 months as a Road Safety Audit Team Leader or Member. In order to become an Audit Team Leader the auditor will already have achieved the necessary training to become an Audit Team Member. However, they should also demonstrate a minimum 2 days CPD in the field of Road Safety Audit, Collision Investigation or Road Safety Engineering in the past 12 months.

- **Road Safety Audit Team Member:** A minimum of 2 years Collision Investigation or Road Safety Engineering experience. Completion of at least 5 Road Safety Audits as Road Safety Audit Team Leader, Member or Observer in the past 24 months. The Road Safety Audit Team Member should have attended at least 10 days of formal Collision Investigation or Road Safety Engineering training to form a solid theoretical foundation on which to base practical experience. They should also demonstrate a minimum of 2 days CPD in the field of Road Safety Audit, Collision Investigation or Road Safety Engineering in the past 12 months.

- **Road Safety Audit Team Observer:** A minimum of 1 year Collision Investigation or Road Safety Engineering experience. The Road Safety Audit Team Observer should have attended at least 10 days of formal Collision Investigation or Road Safety Engineering training.

Road Safety Auditor Certificate of Competency

2.84. At least one individual within the Road Safety Audit Team undertaking Road Safety Audit on the motorway and/or trunk road network must hold a Certificate of Competency in Road Safety Audit, acquired in accordance with Annex J of this Standard.

Specialist Advisors

2.85. The Overseeing Organisation, Design Organisation and the Road Safety Audit Team should consider if there are any particular features of the project, such as complex signal controlled junctions, temporary traffic management or maintenance issues that warrant the appointment of Specialist Advisors to advise the Road Safety Audit Team. Appointment of Specialist Advisors is subject to the approval of the Project Sponsor who would separately instruct them on their role. A Specialist Advisor is not a member of the Road Safety Audit Team but advises the team on matters relating to their specialism.

Design Manual for Roads and Bridges Standard GD 02/08

2.86. Paragraphs 2.76 to 2.84 of this Standard supersede the indicative levels of experience, professional status, training and competency suggested in **GD 02/08 "Quality Management Systems for Highway Design" (DMRB 0.1.2)** for Road Safety Auditors.

Road Safety Audit Brief

2.87. The Road Safety Audit Brief defines the scope of the Road Safety Audit to be undertaken. The Project Sponsor has overall responsibility for the Road Safety Audit Brief. However, the Design Team may prepare the Road Safety Audit Brief on their behalf. A copy of the Road Safety Audit Brief must be forwarded to the Project Sponsor for formal approval in advance of the Road Safety Audit. The Project Sponsor may instruct the Design Team to delete unnecessary items or to include additional material, as they consider appropriate. The Project Sponsor must document the reasons for deleting or adding any information to the Road Safety Audit Brief. The Project Sponsor must issue the Road Safety Audit Brief and instruct the Road Safety Audit Team when the scheme is ready to be Road Safety Audited.

2.88. To maximise the benefit from the Road Safety Audit process, the Road Safety Audit Brief needs careful preparation and must include sufficient information to enable an efficient and effective Road Safety Audit to be undertaken.

2.89. An illustrative Road Safety Audit Brief is shown in Annex E of this Standard. A Road Safety Audit Brief should contain the following:

a) A description of the proposed Highway Improvement Scheme clearly identifying its objectives.

b) Scheme drawings showing the full geographical extent of the scheme and including the areas beyond the tie-in points.

c) Details of determined and pending Departures and Relaxations from Standards, and/or the Design Strategy Record(s) where they have been produced for an improvement to an existing motorway or trunk road.

d) Clear identification of the elements of the scheme proposals included within the scope of the Road Safety Audit to be undertaken and also those elements of the scheme that fall outside of the scope, including strategic decisions. The Road Safety Audit Brief should clearly identify where the scope of the Road Safety Audit has been extended to allow consideration of strategic decisions.

e) General scheme details, to help give an understanding of the purpose of the scheme and how the layout will operate, including design speeds, speed limits, traffic flows, forecast flows, queue lengths, NMU flows and desire lines (including NMU Context and Audit reports undertaken in accordance with **HD 42/05 (DMRB 5.2.5)**). Also details of any environmental constraints on the design and how these may have affected any strategic decisions made.

f) Details of any safety risk assessments undertaken as part of the design process (on the Strategic Road Network in England these will be undertaken with reference to **GD 04/12 "Standard for Safety Risk Assessment on the Strategic Road Network" (DMRB 0.2.3)**).

g) Any other relevant factors which may affect road safety such as adjacent developments (existing or proposed), proximity of schools or retirement/care homes and access for emergency vehicles.

h) The Road Safety Audit Brief should identify if the location of the Highway Improvement Scheme should be visited at a particular time of the day (e.g. peak traffic periods or beginning or end of the school day).

i) For on-line schemes and at tie-ins, the previous 36 months personal injury collision data in the form of 'stick plots' and interpreted listings. The personal injury collision data should cover both the extent of the scheme and the adjoining sections of highway.

j) At Road Safety Audit Stages 2 and 3, details of any changes introduced since the previous Road Safety Audit stage.

k) Any changes in the Highway Improvement Scheme that are not shown on the design or As-Built drawings.

l) Plans using an appropriate scale for the Road Safety Audit Team to mark up for inclusion in the Road Safety Audit Report.

m) Previous Road Safety Audit Reports, Interim Road Safety Audit Reports, Road Safety Audit Response Reports and Exception Report(s)

n) Contact details of the Maintaining Agent to whom any identified maintenance defects should be notified (by telephone and immediately confirmed in writing for serious defects) separately from the Road Safety Audit Report (see paragraph 2.105).

o) Details of the appropriate police contact.

p) Details of any site access arrangements including any specific health & safety requirements such as inductions, Personal Protective Equipment and vehicle livery requirements.

2.90. If the Road Safety Audit Team considers the Road Safety Audit Brief to be insufficient for their purpose, requests for further information shall be made to the Design Team Leader and copied to the Project Sponsor. Any information requested but not supplied to the Road Safety Audit Team must be identified in the introduction to the Road Safety Audit Report.

Road Safety Audit Management

2.91. The Project Sponsor and Design Team should liaise and ensure that the Road Safety Audit process is initiated at the appropriate stages, allowing sufficient programme time to complete the full Road Safety Audit procedure. This should include an allowance for the incorporation of design changes.

2.92. The Design Team should ensure that the Road Safety Audit Team is given sufficient notice of when the scheme will be ready for Road Safety Audit and the date by which the report will be required.

2.93. The Road Safety Audit Team Leader must invite representatives of the Police and the Maintaining Agent to accompany the Road Safety Audit Team to offer their views for the Stage 3 Road Safety Audit.

2.94. The Road Safety Audit Team Leader may also, with the approval of the Project Sponsor, invite representatives of the Police and the Maintaining Agent to advise on Road Safety Audits at Stages 1, 2 and 4 where the Road Safety Audit Team Leader considers that their participation will benefit the Road Safety Audit.

2.95. During any Road Safety Audit site visit the total number of Road Safety Audit Team Members and its advisors should not exceed 6 individuals. This is because traversing sites in large groups can make the Road Safety Audit process more complex and could increase the potential for health & safety issues.

2.96. Site visit risk assessments should be produced prior to visiting site and reviewed during the site visit should conditions change. Risk assessment should be undertaken in accordance with the latest health and safety guidance/legislation and the Road Safety Audit organisation's Health & Safety policy. Any control measures identified during the site visit risk assessment process should be adhered to.

Road Safety Audit Report

2.97. At all Stages, the Road Safety Audit Team must prepare a written report. For Stage 4 Road Safety Audit Reports see paragraph 2.43 to 2.53. Stage 1, 2 and 3 Road Safety Audit Reports shall include:

a) Identification of the Road Safety Audit stage including a unique document reference number and the status of the Road Safety Audit Report.

b) A brief description of the proposed Highway Improvement Scheme including details of its location and its objectives.

c) Details of who supplied the Road Safety Audit Brief, who approved the Road Safety Audit Brief and who approved the Road Safety Audit Team.

d) Identification of the Road Safety Audit Team membership as well as the names of others contributing such as the Police, Maintaining Agent and Specialist Advisors.

e) Details of who was present at the site visit, the date and time period(s) when it was undertaken and what the site conditions were on the day of the visit (weather, traffic congestion, etc.).

f) The specific road safety problems identified, supported with the background reasoning.

g) Recommendations for action to mitigate or remove the road safety problems.

h) A location map based on the scheme plan(s), marked up and referenced to problems and if available, photographs of the problems identified.

i) A statement, signed by both the Road Safety Audit Team Leader and the Road Safety Audit Team Member(s) in the format given in Annex D.

j) A list of documents and drawings reviewed for the Road Safety Audit.

2.98. The Road Safety Audit Report must contain a separate statement for each identified problem describing the location and nature of the problem and the type of collisions or incident considered likely to occur as a result of the problem. When deciding whether to include a potential problem, a Road Safety Auditor must consider who may be involved in a collision and how it might happen. If a collision type cannot be associated with the problem being considered, then it may not be appropriate to include the problem in the Road Safety Audit Report.

2.99. Each problem must be followed by an associated recommendation. The Road Safety Audit Team must aim to provide proportionate and viable recommendations to eliminate or mitigate the identified problems. On the Strategic Road Network in England, this will require awareness of the Highways Agency's level of tolerability of safety risk for road users referred to in **GD 04/12 (DMRB 0.2.3)**. Recommendations to "consider" should be avoided. Recommendations to "monitor" must only be made where a need to supplement the scheduled Stage 4 Road Safety Audit monitoring is specifically identified in terms of frequency and incidence of particular vehicle manoeuvres or collision contributory factors and the monitoring task can be specifically allocated. The use of the word "must" shall also be avoided in Road Safety Audit recommendations, as this may be misinterpreted as an instruction from the Road Safety Audit Team.

2.100. Items such as correspondence with the Overseeing Organisation or copies of marked up checklists must not be included in the Road Safety Audit Report.

2.101. An illustrative Stage 2 Road Safety Audit Report is shown in Annex F. The Road Safety Audit Report format shown is recommended for use for Road Safety Audit Stage 1, 2 and 3 Audits. Alternatively, the Project Sponsor may instruct the Road Safety Audit Team via the Road Safety Audit Brief to present the problems and recommendations in an alternative format, such as the order that they are encountered progressing along the length of the Highway Improvement Scheme.

2.102. The Road Safety Audit Team must send a draft Road Safety Audit Report directly to the Project Sponsor and not via the Design Team. The Road Safety Audit Team Leader shall discuss the draft Road Safety Audit Report with the Project Sponsor prior to formal submission so that misinterpretations of the scheme proposals or anything agreed to be outside the terms of reference can be identified and removed. If a Project Sponsor is unsure if a particular item should be removed from a Road Safety Audit Report, they must formally consult with an appropriate Specialist from the Overseeing Organisation.

2.103. Where the Project Sponsor agrees a variation on a recommendation with the Road Safety Audit Team Leader, this revised recommendation must be incorporated into the final Road Safety Audit Report. The Road Safety Audit Team Leader must consider the need to discuss variations with the Road Safety Audit Team and Specialist Advisors before variations are made and the final Road Safety Audit Report submitted to the Project Sponsor.

2.104. The Road Safety Audit Team Leader must not include in the Road Safety Audit Report, technical matters that have no implications on road safety or any other matters not covered by the Road Safety Audit Brief, such as maintenance defects observed during site visits and health & safety issues.

2.105. The Road Safety Audit Team Leader must send any comments on matters that are not covered by the Road Safety Audit Brief to the Project Sponsor in separate correspondence. Maintenance defects noted during site visits shall be immediately reported direct to the Maintaining Agent and the Project Sponsor must also be informed.

2.106. On receipt of the finalised Road Safety Audit Report, the Project Sponsor must issue the document to the Design Team to allow them to prepare a Road Safety Audit Response Report in accordance with this Standard.

3 ROAD SAFETY AUDIT – SUBSEQUENT ACTIONS

Road Safety Audit Response Report

3.1. It is the Project Sponsor's responsibility to ensure that all problems raised by the Road Safety Audit Team are given due consideration. To assist with this, the Design Team must prepare a Road Safety Audit Response Report to the Road Safety Audit Report at the Stage 1, Combined 1 & 2, Stage 2 and Stage 3 Road Safety Audits.

3.2. An illustrative Road Safety Audit Response Report is shown in Annex K. The Road Safety Audit Response Report should include the following:

a) A summary of the scheme, the Stage of Road Safety Audit, the document reference and date of the Road Safety Audit Report it considers.

b) Full consideration of each problem and recommendation raised in the Road Safety Audit Report.

c) The Road Safety Audit Response Report should reiterate each problem and recommendation made, followed by a suggested Road Safety Audit response from the Design Team. The Road Safety Audit Response Report should include the problem location plan provided in the Road Safety Audit Report.

d) The Road Safety Audit Response Report should, for each problem and recommendation, do one of the following:

- accept the problem and recommendation made by the Road Safety Audit Team;
- accept the problem raised, but suggest an alternative recommendation, giving reasoning for the alternative recommendation or;
- disagree with the problem and recommendation raised, giving appropriate reasoning for rejecting both the problem and recommendation.

e) Details of the representatives from the Design Team who prepared the Road Safety Audit Response Report.

3.3. The Design Team Leader shall send a draft Road Safety Audit Response Report to the Project Sponsor for consideration. Where the Project Sponsor agrees an amendment to a response with the Design Team Leader, this amendment shall be incorporated into the final Road Safety Audit Response Report. If a Project Sponsor is unsure about the contents of a Road Safety Audit Response Report they must formally consult with an appropriate Specialist from the Overseeing Organisation.

3.4. It is possible that the Project Sponsor may not be able to agree all the responses with the Design Team Leader. In this situation the final Road Safety Audit Response Report should identify this difference of opinion.

3.5. The Road Safety Audit Response Report should be issued to the Project Sponsor within 1 month (or an alternative timescale as agreed with the Project Sponsor) of the Design Team receiving the finalised Road Safety Audit Report.

3.6. The Project Sponsor must provide a copy of the final Road Safety Audit Response Report to the Road Safety Audit Team Leader for their information.

Exception Report(s)

3.7. The Road Safety Audit Response Report will initiate the requirement for an Exception Report(s) where:

- the problem and/or recommendation have not been accepted in the final Road Safety Audit Response Report and the Project Sponsor agrees with the response; or
- the Road Safety Audit Response Report accepts a problem and/or recommendation, but the Project Sponsor does not agree with the Road Safety Audit Response Report.

3.8. An Exception Report must also be produced if the Project Sponsor considers:

- any Road Safety Audit problem raised to be insignificant; or
- the Road Safety Audit problem to be outside the scope of the Road Safety Audit Brief; or
- that the Road Safety Audit solutions recommended are not suitable given the relevant economic, environmental, or other relevant constraints; or
- that the Road Safety Audit recommendations are technically not feasible.

3.9. In the situations identified in paragraphs 3.7 and 3.8 above, the Project Sponsor must prepare an Exception Report giving reasons and proposing alternatives for submission to the Overseeing Organisation's Director, with whom the final decision rests. Where an Exception Report(s) is approved by the Director, a record of this approval must be kept by the Project Sponsor on the Overseeing Organisation's scheme file (or equivalent). Should the Director disagree with the contents of the Exception Report(s), the Project Sponsor will either implement the Road Safety Audit Recommendation(s) or amend the Exception Report(s) to the satisfaction of the Overseeing Organisation Director.

3.10. If there is more than one exception in respect of a Road Safety Audit then each exception must be considered and approved separately.

3.11. When preparing Exception Report(s) on the Strategic Road Network in England, Project Sponsors must follow the principles contained in **GD 04/12 (DMRB 0.2.3)**. So when compiling an Exception Report(s) the Project Sponsor must ensure that an appropriate risk assessment is undertaken with consideration of the road safety risks associated with the potential problem and/or recommendation. The Project Sponsor must also consider the impact on other road users, those working on the highway, those living or working adjacent to the highway and the impact on the environment and scheme costs.

3.12. When producing Exception Reports, Project Sponsors may contact the Overseeing Organisation Specialists for advice.

3.13. The Project Sponsor shall provide copies of each approved Exception Report to the Design Team and Road Safety Audit Team Leader for action and information respectively.

3.14. For schemes undertaken on the Highways Agency road network, the Project Sponsor must also provide electronic copies of the final Road Safety Audit Reports, Road Safety Audit Response Reports and any Exceptions Reports to the Highway Agency Safer Roads - Design Team for their records.

Subsequent Actions

3.15. The Project Sponsor must instruct the Design Team in respect of any changes required during the preparation, design and construction of the scheme resulting from Road Safety Audit.

3.16. If the changes are substantial, the Project Sponsor should resubmit the Highway Improvement Scheme or element of the scheme that has materially changed for a further Road Safety Audit (see paragraphs 2.62 and 2.63). If a Project Sponsor is unsure if the Highway Improvement Scheme or element of the scheme needs to be resubmitted for Road Safety Audit they should formally consult with an appropriate Specialist from the Overseeing Organisation.

3.17. The Project Sponsor is responsible for initiating prompt action on all recommendations in the Road Safety Audit Report and on all Exception Reports approved by the Director. The Project Sponsor must notify the Director of the reasons if works to implement Stage 3 Road Safety recommendations or alternative measures proposed in Exception Reports, are not completed within 6 months of acceptance of the Stage 3 Road Safety Audit recommendations and/or approval of Exception Reports.

3.18 The Stage 4 Road Safety Audit Reports (see paragraphs 2.43 to 2.53) must be submitted to the Overseeing Organisation who will consider the reports and decide on appropriate action. Decisions made by the Project Sponsor in respect of the Stage 4 Road Safety Audit recommendations must be recorded by the Project Sponsor on the Overseeing Organisation's scheme file (or equivalent).

4. REFERENCES

1) Safety at Street Works and Road Works A Code of Practice – Department for Transport, October 2013

2) Department for Transport Traffic Signs Manual (TSM) Chapter 8 (2009)

3) GD 02/08, DMRB 0.1.2, Quality Management Systems for Highway Design

4) GD 04/12, DMRB, 0.2.3, Standard for Safety Risk Assessment on the Strategic Road Network

5) HD 42/05, DMRB, 5.2.5, Non-Motorised User Audits

6) European Commission (EC) Directive 2008/96/EC on Road Infrastructure Safety Management

5. ENQUIRIES

All technical enquiries or comments on this Standard should be sent in writing as appropriate to:

Chief Highway Engineer
The Highways Agency
Temple Quay House
The Square
Temple Quay
Bristol
BS1 6HA

M WILSON
Chief Highways Engineer

Trunk Road and Bus Operations
Transport Scotland
8th Floor, Buchanan House
58 Port Dundas Road
Glasgow
G4 0HF

R BRANNEN
Director, Trunk Road and Bus Operations

Deputy Director Network Management Division
Network Management
Welsh Government
Transport
Cardiff CF10 3NQ
Wales

S HAGUE
Deputy Director
Network Management Division

Director of Engineering
Department for Regional Development
Transport NI
Clarence Court
10-18 Adelaide Street
Belfast BT2 8GB

P B DOHERTY
Director of Engineering

ANNEX A: STAGE 1 ROAD SAFETY AUDIT CHECKLISTS – COMPLETION OF PRELIMINARY DESIGN

List A1 – General

Item	Possible Issues
• Departures from Standards	What are the road safety implications of any approved Departures from Standards or Relaxations? (Are these strategic decisions within the scope of the Road Safety Audit?)
• Cross-sections	How safely do the cross-sections accommodate drainage, ducting, signing, fencing, lighting and pedestrian and cycle routes?
	Could the scheme result in the provision of adverse camber?
• Cross-sectional Variation	What are the road safety implications if the standard of the proposed scheme differs from adjacent lengths of highway?
• Drainage	Will the new road drain adequately, or could areas of excess surface water result?
	Could excess surface water turn to ice during freezing conditions?
	Could excessive water drain across the highway from adjacent land?
• Landscaping	Could areas of landscaping conflict with sight lines (including during windy conditions)?
• Public Utilities/Services Apparatus	Could utility apparatus be struck by an errant vehicle?
	Could utility apparatus obscure sight lines?
• Lay-bys	Has adequate provision been made for vehicles to stop off the carriageway including picnic areas?
	How will parked vehicles affect sight lines?
	Could lay-bys be confused with junctions?
	Is the lay-by located in a safe location (e.g., away from vertical crests or tight horizontal alignments with limited visibility)?
• Access	Can all accesses be used safely?
	Can multiple accesses be linked into one service road?
	Are there any conflicts between turning and parked vehicles?
• Emergency Vehicles	Has provision been made for safe access and egress by emergency vehicles?

• Future Widening	Where a single carriageway scheme is to form part of a future dual carriageway, is it clear to road users that the road is for two-way traffic?
• Adjacent Development	Does adjacent development cause interference/confusion? (e.g. lighting or traffic signals on adjacent roads may affect a road user's perception of the road ahead)
• Basic Design Principles	Are the overall design principles appropriate for the predicted level of use for all road users?

List A2 – Local Alignment

Item	**Possible Issues**
• Visibility	Are horizontal and vertical alignments consistent with required visibility? Will sight lines be obstructed by permanent or temporary features e.g. bridge abutments and parked vehicles?
• New/Existing Road Interface	Will the proposed scheme be consistent with the standard of provision on adjacent lengths of road and if not, is this made obvious to the road user? Does interface occur near any potential hazard, i.e. crest, bend after steep gradient?
• Vertical Alignment	Are climbing lanes to be provided? Will the vertical alignment cause any "hidden dips"?

List A3 – Junctions

Item	**Possible Issues**
• Layout	Is provision for right turning vehicles required? Are acceleration/deceleration lanes required? Are splitter islands required on minor arms to assist pedestrians or formalise road users movements to/from the junction? Are there any unusual features that affect road safety? Are widths and swept paths adequate for all road users? Will large vehicles overrun pedestrian or cycle facilities? Are there any conflicts between turning and parked vehicles? Are any junctions sited on a crest? Is the junction type appropriate for the traffic flows and likely vehicle speeds?

• Visibility	Are sight lines adequate on and through junction approaches and from the minor arm? Are visibility splays adequate and clear of obstructions such as street furniture and landscaping? Will the use of deceleration or acceleration lanes obscure junction visibility?

List A4 – Non-Motorised User (NMU) Provision

Item	Possible Issues
• Adjacent Land	Will the scheme have an adverse effect on safe use of adjacent land?
• Pedestrian/Cyclists	Have pedestrian and cycle routes been provided where required? Do shared facilities take account of the needs of all user groups? Can verge strips dividing footways/cycleways and carriageways be provided? Where footpaths have been diverted, will the new alignment permit the same users free access? Are footbridges/subways sited to attract maximum use? Is specific provision required for special and vulnerable groups? (i.e. the young, older users, mobility and visually impaired?) Are tactile paving, flush kerbs and guard railing proposed? Is it specified correctly and in the best location? Have all NMU needs been considered, especially at junctions? Are these routes clear of obstructions such as signposts, lamp columns etc.?
• Equestrians	Have equestrian needs been considered? Does the scheme involve the diversion of bridleways?

List A5 – Road Signs, Carriageway Markings and Lighting

Item	Possible Issues
• Signs	Is there likely to be sufficient highway land to provide the traffic signs required? Are sign gantries needed? Have traffic signs been located away from locations where there is a high strike risk?

• Lighting	Is the scheme to be street lit? Has lighting been considered at new junctions and where adjoining existing roads? Are lighting columns located in the best positions? (e.g. behind safety fences)
• Poles/Columns	Will poles/columns be appropriately located and protected?
• Road Markings	Are any road markings proposed at this stage appropriate?

ANNEX B: STAGE 2 ROAD SAFETY AUDIT CHECKLISTS – COMPLETION OF DETAILED DESIGN

The Road Safety Audit Team should satisfy itself that all issues raised at Stage 1 Road Safety Audit have been resolved. Items may require further consideration where significant design changes have occurred.

If a Highway Improvement Scheme has not been subject to a Stage 1 Road Safety Audit, the items listed in Lists A1 to A5 should be considered together with the items listed below.

List B1: General

Item	Possible Issues
• Departures from Standards	Consider road safety aspects of any Departures granted since the Stage 1 Road Safety Audit.
• Drainage	Do drainage facilities (e.g. gully spacing, gully locations, flat spots, crossfall, ditches) appear to be adequate? Do features such as gullies obstruct cycle routes, footpaths or equestrian routes or are they located on NMU desire lines? Do the locations of features such as manhole covers give concern for motorcycle/cyclist stability? Is surface water likely to drain across a carriageway and increase the risk of aquaplaning under storm conditions?
• Climatic Conditions	Is there a need for specific provision to mitigate effects of fog, wind, sun glare, snow, and ice?
• Landscaping	Could planting (new or when mature) encroach onto the carriageway or obscure signs or sight lines (including during windy conditions)? Could earth bunds obscure signs or visibility? Could trees (new or when mature) be a hazard to an errant vehicle? Could planting affect lighting or shed leaves on to the carriageway?
• Public Utilities/Services Apparatus	Can maintenance vehicles stop clear of traffic lanes? If so, could they obscure signs or sight lines? Are boxes, pillars, posts and cabinets located in safe positions away from locations that may have a high potential of errant vehicle strikes? Do they interfere with visibility? Has sufficient clearance to overhead cables been provided?

	Have any special accesses/parking areas been provided and are they safe?
	Are there any utility inspection chambers in live traffic lanes and/or wheel tracks?
• Lay-bys	Have lay-bys been positioned safely?
	Could parked vehicles obscure sight lines?
	Are lay-bys adequately signed?
	Are picnic areas properly segregated from vehicular traffic?
• Access	Is the visibility to/from accesses adequate?
	Are the accesses of adequate length to ensure all vehicles clear the main carriageway?
	Do all accesses appear safe for their intended use?
• Skid Resistance	Are there locations where high skid resistance surfacing (such as on approaches to junctions and crossings) would be beneficial?
	Do surface changes occur at locations where they could adversely affect motorcycle stability?
	Is the colour of any high friction surfacing appropriate?
• Agriculture	Have the needs of agricultural vehicles and plant been taken into consideration (e.g. room to stop between carriageway and gate, facilities for turning on dual carriageways)? Are such facilities safe to use and are they adequately signed?
• Fences and Road Restraint Systems	Is there a need for road restraint systems to protect road users from signs, gantries, parapets, abutments, steep embankments or water hazards?
	Do the road restraint systems provided give adequate protection?
	Are the road restraint systems long enough?
	Are specific restraint facilities required for motorcyclists?
	In the case of wooden post and rail boundary fences, are the rails placed on the non-traffic side of the posts?
	If there are roads on both sides of the fence is an interlocking-design necessary to prevent impalement on impact?
• Adjacent Developments and Roads	Has screening been provided to avoid headlamp glare between opposing carriageways, or any distraction to road users?

	Are there any safety issues relating to the provision of environmental barriers or screens?

List B2: Local Alignment

Item	Possible Issues
• Visibility	Obstruction of sight lines by: i. safety fences ii. boundary fences iii. street furniture iv. parking facilities v. signs vi. landscaping vii. structures viii. environmental barriers ix. crests x. features such as buildings, plant or materials outside the highway boundary Is the forward visibility of at-grade crossings sufficient to ensure they are conspicuous?
• New/Existing Road Interface	Where a new road scheme joins an existing road, or where an on-line improvement is to be constructed, will the transition give rise to potential hazards? Where the road environment changes (e.g. urban to rural, restricted to unrestricted) is the transition made obvious by appropriate signing and carriageway markings?

List B3: Junctions

Item	Possible Issues
• Layout	Are the junctions and accesses adequate for all vehicular movements? Are there any unusual features, which may have an adverse effect on road safety? Have guard rails/safety fences been provided where appropriate?

	Do any roadside features (e.g. guard rails, safety fences, traffic bollards signs and traffic signals) intrude into drivers' line of sight?
	Are splitter islands and bollards required on minor arms to assist pedestrians or formalise road users' movements to/from the junction?
	Are parking or stopping zones for buses, taxis and public utilities vehicles situated within the junction area? Are they located outside visibility splays?
• Visibility	Are the sight lines adequate at and through the junctions and from minor roads?
	Are visibility splays clear of obstruction?
• Signing	Is the junction signing adequate, consistent with adjacent signing and easily understood?
	Have the appropriate warning signs been provided?
	Are signs appropriately located and of the appropriate size for approach speeds?
	Are sign posts passively safe or protected by safety barriers where appropriate?
	Are traffic signs illuminated where required?
	Are traffic signs located in positions that minimise potential strike risk?
	Is the mounting height of sign faces appropriate?
	Are traffic signs orientated correctly to ensure correct visibility and reflectivity?
• Road Markings	Do the carriageway markings clearly define routes and priorities?
	Are the dimensions of the road markings appropriate for the speed limit/design speed of the road?
	Have old road markings and road studs been adequately removed?
• T, X, Y-Junctions	Have ghost island right turn lanes and refuges been provided where required?
	Do junctions have adequate stacking space for turning movements?
	Can staggered crossroads accommodate all vehicle types and movements?

• All Roundabouts	Are the deflection angles of approach roads adequate for the likely approach speed?
	Are splitter islands necessary?
	Is visibility on approach adequate to ensure drivers can perceive the correct path through the junction?
	Where chevron signs are required, have they been correctly sited?
	Are dedicated approach lanes required? If provided, will the road markings and signs be clear to all users?
• Mini Roundabouts	Are the approach speeds for each arm likely to be appropriate for a mini roundabout?
	Is the mini roundabout appropriate for the likely traffic volumes?
	Is the centre island visible from all approaches?
• Traffic Signals	Will speed discrimination equipment be required?
	Is the advance signing adequate?
	Are signals clearly visible in relation to the likely approach speeds?
	Is “see through” likely to be a problem?
	Would lantern filters assist?
	Is the visibility of signals likely to be affected by sunrise/sunset?
	Would high intensity signals and/or backing boards improve visibility?
	Would high-level signal units be of value?
	Is the stopline in the correct location?
	Are any pedestrian crossings excessively long?
	Are the proposed tactile paving layouts correct?
	Are the markings for right turning vehicles adequate?
	Is there a need for box junction markings?
	Is the phasing appropriate?
	Will pedestrian/cyclist phases be needed?
	Does the number of exit lanes equal the number of approach lanes?
	If not is the taper length adequate?
	Is the required junction intervisibility provided?

List B4: Non-Motorised User (NMU) Provision

Item	Possible Issues
• Adjacent Land	Are accesses to and from adjacent land/properties safe to use? Has adjacent land been suitably fenced?
• Pedestrians	Are facilities required for NMUs at: a) junctions; b) pelican/puffin/zebra crossings; c) refuges or; d) other locations? Are crossing facilities placed and designed to attract maximum use? Are guardrails/fencing present/required to deter pedestrians from crossing the road at unsafe locations? Is tactile paving and flush kerbs proposed? Is it specified correctly and in the best location? For each type of crossing (bridges, subways, at grade) have the following been fully considered? a) visibility both by and of pedestrians; b) use by cyclists; c) use by mobility and visually impaired; d) use by older users; e) use by children/schools; f) need for guardrails in verges/central reserve; g) signs; h) width and gradient; i) surfacing; j) provision of dropped kerbs; k) avoidance of channels and gullies; l) need for deterrent kerbing; m) need for lighting;

• Cyclists	Have the needs of cyclists been considered especially at junctions and roundabouts?
	Are cycle lanes or segregated cycle tracks required?
	Does the signing make clear the intended use of such facilities?
	Are cycle crossings adequately signed?
	Do guardrails need to be provided to increase cyclist's awareness of potential hazards such as a road crossing?
	Has lighting been provided on cycle routes?
	Are any proposed drop kerbs flush with the adjacent highway?
	Are any parapet heights sufficient?
	Is tactile paving proposed? Is it specified correctly and in the best location?
• Equestrians	Should bridleways or shared facilities be provided?
	Does the signing make clear the intended use of such paths and is sufficient local signing provided to attract users?
	Have suitable parapets/rails been provided where necessary?

List B5: Road Signs, Carriageway Markings and Lighting

Item	**Possible Issues**
• Traffic Signs	Do destinations shown accord with signing policy?
	Are signs easy to understand?
	Are sign structures passively safe?
	Are the signs located behind safety fencing and out of the way of pedestrians and cyclists?
	Is there a need for overhead signs?
	Where overhead signs are necessary is there sufficient headroom to enable designated NMU usage?
	Is the sign reflectivity provided correct?
	Has sign clutter been considered?
• Variable Message Signs	Are the legends relevant and easily understood?
	Are signs passively safe or located behind safety fencing?

• Lighting	Has lighting been considered at new junctions and where adjoining existing roads? Is there a need for lighting, including lighting of signs and bollards? Are lighting columns passively safe? Are lighting columns located in the best positions e.g. behind safety fences and not obstructing NMU routes?
• Road Markings	Are road markings appropriate to the location? a) centre lines; b) edge lines; c) hatching; d) road studs; e) text/destinations; f) approved and/or conform to the Regulations.
• Poles and Columns	Are poles and columns passively safe? Are poles and columns protected by safety fencing where appropriate?

ANNEX C: STAGE 3 ROAD SAFETY AUDIT CHECKLISTS – COMPLETION OF CONSTRUCTION

The Road Safety Audit Team should consider whether the design has been properly translated into the scheme as constructed and that no inherent road safety defect has been incorporated into the works.

Particular attention should be paid to design changes, which have occurred during construction.

List C1: General	Possible Issues
• Departures from Standards	Are there any adverse road safety implications of any Departures from Standard granted since the Stage 2 Road Safety Audit?
• Drainage	Does drainage of roads, cycle routes and footpaths appear adequate? Do drainage features such as gullies obstruct footpaths, cycle routes or equestrian routes?
• Climatic Conditions	Are any extraordinary measures required?
• Landscaping	Could planting obscure signs or sight lines (including during periods of windy weather)? Do earth bunds obscure signs or visibility? Could trees (new or when mature) be a potential hazard to an errant vehicle? Could planting affect lighting or shed leaves onto the carriageway?
• Public Utilities	Can maintenance vehicles stop clear of traffic lanes? If so, could they obscure signs or sight lines? Are boxes, pillars, posts and cabinets located in safe positions away from locations that may have a high potential for errant vehicle strikes? Do they interfere with visibility? Are any special accesses/parking areas provided safe? Are there any utility inspection chambers in live traffic lanes and/or wheel tracks? Are utility service covers and gullies located in the verge level with the surrounding ground so as not to present a potential hazard to an errant vehicle?
• Access	Is the visibility to/from accesses adequate? Are the accesses of adequate length to ensure all vehicles clear the main carriageway?

• Skid Resistance	Do any joints in the surfacing appear to have excessive bleeding or low skid resistance? Do surface changes occur at locations where they could adversely affect motorcycle stability?
• Fences and Road Restraint Systems	Is the restraint system adequate? In the case of wooden post and rail boundary fences, are the rails placed on the non-traffic side of the posts?
• Adjacent Development	Have environmental barriers been provided and do they create a potential hazard?
• Bridge Parapets	Is the projection of any attachment excessive?
• Network Management	Have appropriate signs and/or markings been installed in respect of Traffic Regulation Orders?

List C2: Local Alignment

Item	**Possible Issues**
• Visibility	Are the sight lines clear of obstruction?
• New/Existing Road Interface	Is there a need for additional signs and/or road markings?

List C3: Junctions

Item	**Possible Issues**
• Visibility	Are all visibility splays clear of obstructions?
• Road Markings	Do the carriageway markings clearly define routes and priorities? Have all superseded road markings and studs been removed adequately?
• Roundabouts	Can the junction be seen from appropriate distances and is the signing adequate? Where chevron signs are required, have they been correctly sited?
• Traffic Signals	Can the traffic signals be seen from appropriate distances? Can drivers see traffic signal heads for opposing traffic? For the operation of signals: Do signal phases correspond to the design? Do NMU phases give adequate crossing time? Can NMUs mistakenly view the “green man” signal for other NMU phases?

• T, X and Y Junctions	Are priorities clearly defined? Is signing adequate?

List C4: Non-Motorised User (NMU) Provision

Item	Possible Issues
• Adjacent Land	Has suitable fencing been provided?
• Pedestrians	Are the following adequate for each type of crossing (bridges, subways, at grade)? a) visibility; b) signs; c) surfacing; d) other guardrails; e) drop kerbing or flush surfaces; f) tactile paving.
• Cyclists	Do the following provide sufficient levels of road safety for cyclists on, or crossing the road? a) visibility; b) signs; c) guardrails; d) drop kerbing or flush surfaces; e) surfacing; f) tactile paving.
• Equestrians	Do the following provide sufficient levels of road safety for equestrians? a) visibility; b) signs; c) guardrails.

List C5: Road Signs, Carriageway Markings and Lighting

Item	Possible Issues
• Signs	Are the visibility, locations and legibility of all signs (during daylight and darkness) adequate?
	Are signposts protected from vehicle impact or passively safe?
	Will signposts impede the safe and convenient passage of pedestrians and cyclists?
	Have additional warning signs been provided where necessary?
• Variable Message Signs (VMS)	Can VMS be read and easily understood at distances appropriate for vehicle speeds?
	Are they adequately protected from vehicle impact or passively safe?
• Lighting	Does the street lighting provide adequate illumination of roadside features, road markings and non-vehicular users to drivers?
	Is the level of illumination adequate for the road safety of NMUs?
	Is lighting obscured by vegetation or other street furniture?
• Carriageway Markings	Are all road markings/studs clear and appropriate for their location?
	Have all superseded road markings and studs been removed adequately?

ANNEX D: ROAD SAFETY AUDIT TEAM STATEMENT

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

AUDIT TEAM LEADER:

Name: Signed:

Position: Date:

Organisation:

Address:

AUDIT TEAM MEMBERS

Name: Signed:

Position: Date:

Organisation:

Address:

Name: Signed:

Position: Date:

Organisation:

Address:

OTHERS INVOLVED

(E.g. Observer, Police, Network Management Representative, Specialist Advisor)

ANNEX E: ILLUSTRATIVE ROAD SAFETY AUDIT BRIEF
A795 AMBRIDGE BYPASS
ROAD SAFETY AUDIT STAGE 2

December 2015

Document Reference: A795AMBP/RSA2BRIEF/1/0

PREPARED BY:
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On behalf of:
The Highway Authority
1 Bentall Street
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BO1 8KZ

AUTHORISATION SHEET

Project: A795 Ambridge Bypass

Report Title: Stage 2 Road Safety Audit Brief

PREPARED BY:

Name: Laurie Driver

Signed: Laurie Driver

Organisation: DLS Partnership

Date: 7th December 2015

APPROVED ON BEHALF OF THE OVERSEEING ORGANISATION BY:

Name: Elaine Gain

Signed: Elaine Gain

Organisation: The Highway Authority

Date: 7th December 2015

ROAD SAFETY AUDIT BRIEF

1.	**General Details**							
1.1.	**Highway Improvement Scheme Name and Road Number:**	A795 Ambridge Bypass						
1.2.	**Type of Scheme** (e.g. new road scheme, junction improvement, traffic signs and road markings improvement, traffic calming scheme, etc.) New road scheme (bypass)							
1.3.	**Road Safety Audit Stage** (tick as appropriate)	1	2 ✓	1&2	3	Interim	4 (12 Months)	4 (36 Months)
1.4.	**Overseeing Organisation Project Sponsor Details** Elaine Gain The Highway Authority 1 Bentall Street Borchester BO1 8KZ Tel: 01596 69804				**1.5.**	**Design Organisation Details** Ambridge Bypass Design Team DLS Partnership (Highways Division) 12-14 Cathedral Close Borchester BO1 6LZ Tel: 01596 698739		
1.6.	**Police Contact Details** (Required for Stage 3 Road Safety Audits only) Not required for this Stage 2 Road Safety Audit				**1.7.**	**Maintaining Agent Contact Details** Area 51 Maintaining Agent 40 Sydenham Street Borchester BO1 1LS Tel: 01596 151173		
1.8.	**Road Safety Audit Team Membership** (if known) M Juan (Audit Team Leader) — BSc, MSc, CEng, MICE, MCIHT Ewing and Barnes Partnership (Traffic and Collision Investigation Division) Hugh Turner — IEng, FIHE Ewing and Barnes Partnership (Traffic and Collision Investigation Division) A Rhodes — MEng, CEng, MICE Road Safety Engineering Consultant							

1.9.	**Terms of Reference** The Stage 2 Road Safety Audit (RSA) is to be undertaken fully in accordance with the DMRB Standard HD 19/15, as well as the contents of this Road Safety Audit Brief (document reference: A795AMBP/RSA2BRIEF/1/0)
2.	**Scheme Description/Objective (provide a brief description of the scheme and its objectives)**
2.1.	**General** (including scheme purpose and start date for construction) The proposed A795 Ambridge Bypass includes the provision of 2.3km of 7.3m wide single carriageway between Station Road to the south of the A827 and Ambridge Road to the north east of Ambridge village. The scheme includes the provision of 5 priority junctions and a roundabout at the A827 dual carriageway junction. The improvement also encompasses the provision of two lay-bys, the diversion of a footpath and the stopping up of the Old Church Lane. The purpose of the proposed Ambridge Bypass is to alleviate congestion and delay during peak periods caused by insufficient capacity on the existing A795 through Ambridge. Congestion in Ambridge is impacting on road safety, affecting journey times and causing community severance. The scheme has full funding and an estimated construction commencement date of November 2016.
2.2.	**Design Standards Applied to the Scheme Design** The A795 Ambridge Bypass scheme has been fully designed in accordance with the Design Manual for Roads and Bridges (DMRB), and any relevant Overseeing Organisation Interim Advice Notes (IAN), current at the time the detailed design commenced in January 2015.
2.3.	**Design Speeds** The Design Speed for the proposed A795 Ambridge Bypass is 100 kph. Works on Home Farm Road, Old Church Lane and Station Road have been undertaken to a 50 kph Design Speed. Works at the tie-in at the A827 have been undertaken using a 100 kph Design Speed.
2.4.	**Speed Limits (state whether mandatory or advisory)** The A795 Ambridge Bypass will be subject to the national speed limit (mandatory). Home Farm Road, Old Church Lane and Station Road will all have a posted mandatory speed limit of 30 mph within the extents of the scheme. At the tie-in with the A795, the A827 has a mandatory 60 mph posted speed limit.
2.5.	**Existing Traffic Flows/Queues** An Automatic Traffic Counter (ATC) located on Station Road south of Ambridge Train Station shows that in 2012 the Annual Average Daily Traffic (AADT) flows on the existing A795 were 10,000 northbound and 12,000 southbound. During the peak hours (08.00-09.00 and 17.00-18.00) two-way traffic flows are 2200 and 2300 respectively. Peak hour traffic flows result in the A795 being at capacity and as such queues are forming in both directions in both the AM and PM peaks.

2.6. Forecast Traffic Flows

Post construction (2018) AADT traffic flows on the A795 Ambridge Bypass are forecast to be 11,000 northbound and 13,000 southbound. Traffic flows during the peak hours are forecast to be approximately 1200 northbound and 1300 southbound. Full future traffic flow turning diagrams are attached to this Road Safety Audit Brief.

Full traffic data including proportions of HGVs and cyclists, as well as future predicted traffic flows taken from the scheme feasibility study, is attached to this Road Safety Audit Brief.

2.7. Non-Motorised User (NMU) Desire Lines

All existing footpaths in the vicinity of the proposed Ambridge Bypass are numbered on drawing AMB956789A-1200-07 (Rev A) included with this Road Safety Audit Brief. Proposed realignments of existing footpaths are also shown on drawing AMB956789A-1200-07 (Rev A). This drawing indicates the observed and predicted pedestrian movements within the extents of the scheme.

Details of pedestrian and cyclist movements in the vicinity of the extents of the scheme are included in the NMU Audit Report (document reference AMB/NMU/1/13), produced in accordance with the DMRB Standard HD 42/05.

2.8. Environmental Constraints

All environmental constraints within the scheme extents are shown on drawing AMB956789A-1200-05 (Rev B) included with this Road Safety Audit Brief. It should be noted that land to the west of the proposed bypass includes areas of Site of Special Scientific Interest (SSSI) and the Ambridge railway building which is Grade II listed.

3. Description of Locality (provide details of any relevant factors which may affect road safety)

3.1. General Description

Vehicular access to the town of Ambridge is currently provided by the rural road of the A795 and the A827. The A795 is single carriageway subject to national speed limits. The A827 is dual carriageway between Borchester and Ambridge Railway Station, where it joins with a single carriageway section of the A827 which continues on to Ambridge town centre.

The proposed Ambridge Bypass will tie in with the existing A795 alignment to the north east and south east of Ambridge. The proposed Bypass will also interface with Old Church Lane and Home Farm Road.

The following land uses will be within close proximity of the proposed Ambridge Bypass:

- Ambridge Railway Station;
- Westlee Dairy.

The area around the proposed bypass is generally rural pasture land. There are no schools or care homes in the area.

3.2.	Relevant Factors which may affect Road Safety The following factors have been identified that may affect road safety: • pedestrian and vehicular interfaces at Home Farm Road, Old Church Lane and in the vicinity of Ambridge Railway Station; • the location of the existing Ambridge Railway Station bus stop; • proximity to Westlee Dairy.
4.	**Personal Injury Collision Analysis (provide personal injury collision data covering both the extent of the scheme and the adjoining sections of highway)**
4.1.	**Summary of Personal Injury Collision Data** (a minimum of the most recent 36 months available) Personal Injury Collision data for the period between 01/06/10 and 30/05/13 has been reviewed to identify if there are any existing collision problems at the proposed Ambridge bypass tie-ins and up to 100m either side of the tie-in locations. The details of the personal injury collisions that occurred are shown on a stick plot included with this Road Safety Audit Brief. Full Stats19 listings have also been attached to this Road Safety Audit Brief.
4.2.	**Personal Injury Collision Details** In the vicinity of the proposed north tie-in with the existing A795 alignment, 2 personal injury collisions occurred between 01/06/10 and 30/05/13. Both personal injury collisions resulted in only slight injuries, did not involve pedestrians or cyclists, were rear shunts and occurred during the day on a dry road surface. In the vicinity of the proposed south tie-in only 1 personal injury collision occurred. This personal injury collision involved a pedestrian who was seriously injured and occurred during the hours of darkness close to Ambridge Railway Station.
5.	**Departures and Relaxations from Standards (including details of their status – approved or pending). plus any Design Strategy Records produced for improvements to existing motorways and trunk roads.**
5.1.	**General** The proposed Ambridge Bypass scheme contains two Departures from DMRB Standards. These are detailed below and indicated on drawing AMB956789A-1200-06 (Rev C) included with this Road Safety Audit Brief. Both Departures from Standard have been approved by the appropriate Specialist in the Overseeing Organisation. No Design Strategy Records have been produced for this scheme.

5.2. Departure from Standard 1

This Departure refers to the reduced Stopping Sight Distance (SSD) on the Station Road approach to the junction with the proposed Ambridge Bypass. The layout provides 59m visibility to the 0.26m object height on the junction approach, which is one step below the Desirable Minimum for a 50 kph Design Speed. Design Manual for Roads and Bridges Standard TD 42/95, mandatory paragraph 7.6a, requires that approaching drivers shall have unobstructed visibility of the junction from a distance corresponding to the Desirable Minimum Stopping Sight Distance (SSD) for the Design Speed of the minor road, as described in TD 9 (DMRB 6.1.1). This allows drivers time to slow down safely at the junction, or stop, if this is necessary.

Where a "Give Way" sign is proposed the visibility envelope shall be widened to include the sign. For a 50 kph design speed this would equate to a requirement of 70m approach visibility.

The additional cost of a compliant design in this location is approximately £83,000 and would require land take from the railway station car park, plus removal of mature vegetation.

Retaining the existing layout of Station Road maintains the nature and character of the road, maintains low vehicle speeds and ensures that environmental impacts, land take and costs are minimised.

Although the existing geometry is below Standards for the posted 30 mph speed limit, the existing layout is consistent with the adjoining section of Station Road which provides a road with a narrow width, high degree of bendiness and reduced forward visibility. This will help to restrict vehicle speeds on a road that will experience low levels of traffic.

5.3. Departure from Standard 2

This Departure refers to the reduced cross-section on the existing Home Farm Road approach to the proposed Ambridge Bypass. The layout provides a carriageway width that varies from 2.7m to 4.3m wide with 2.5m (approx.) grassed verges. Design Manual for Roads and Bridges Standard TD 27/05 Figure 4-3a requires rural all-purpose single carriageway roads to be 7.3m wide with 1.0m hardstrips and 2.5m wide verges on either side.

The additional cost of a compliant design is approximately £250,000, and would require land take from Home Farm and the removal of 200m of mature vegetation.

Retaining the existing cross-section of Home Farm Road maintains the nature and character of the road, maintains low vehicle speeds and ensures that environmental impacts, land take and costs are minimised. It should be noted that Home Farm Road provides access to 6 residential properties only.

Although the existing geometry is below Standards, the existing layout is consistent with the rest of Home Farm Road which provides a road with a narrow width, high degree of bendiness and reduced forward visibility. This will help to restrict vehicle speeds on a road that will experience very low levels of traffic. Widening of the road on the approach to the proposed Ambridge Bypass to meet current standards could increase vehicle speeds on the road.

6.	**Previous Road Safety Audit Reports, Road Safety Audit Response Reports and Exception Reports**
6.1.	**Stage 1** A Stage 1 Road Safety Audit Report was received by the Design Team in November 2012. A Road Safety Audit Response Report to the Stage 1 Road Safety Audit Report was issued to The Highway Authority in December 2012. These documents are included with this Road Safety Audit Brief.
6.2.	**Exception Reports** No Exception Reports have been prepared in relation to the proposed Ambridge Bypass scheme, as all of the issues raised in the Stage 1 Road Safety Audit were accepted by the Design Team and Overseeing Organisation.
7.	**Strategic Decisions – Items outside the scope of this Road Safety Audit**
7.1.	**General** A strategic decision to provide street lighting throughout the scheme has been made. However, street lighting between a point 100m north of the A827 junction and 100m south of the A795/bypass junction will be switched off between 12am and 4am. In accordance with paragraph 2.21 of HD 19/15, the Road Safety Audit Team is reminded that recommendations to make significant changes to this element of the scheme are unlikely to be acceptable.
8.	**List of included documents and drawings**
8.1.	**Documents**

Reference	**Title**	**Date**
AMB-RSA-S1/06/12	Stage 1 Road Safety Audit	November 2012
AMB-RSA-S1-DS/08/12	Stage 1 Road Safety Audit Response	December 2012
AMB-CR/03/13	Collisions Report (including location plan and Stats19 data)	August 2013
AMB Feasibility/01/12	Extracts from the A795 Feasibility Study Report showing existing and future traffic flows	June 2012
AMB/NMU/1/13	NMU Audit Report	June 2013

8.2.	Drawings	
	Drawing No.	**Title**
	AMB956789A-1200-01 Rev C	Site Location Plan
	AMB956789A-1200-02 Rev C – Sheet 1 of 4	Scheme Layout
	AMB956789A-1200-02 Rev C – Sheet 2 of 4	Scheme Layout
	AMB956789A-1200-02 Rev C – Sheet 3 of 4	Scheme Layout
	AMB956789A-1200-02 Rev C – Sheet 4 of 4	Scheme Layout
	AMB956789A-1200-03 Rev B	Road Markings
	AMB956789A-1200-04 Rev C	Traffic Signs
	AMB956789A-1200-05 Rev B	Environmental Constraints
	AMB956789A-1200-06 Rev C	Departures from Standards
	AMB956789A-1200-08 Rev A	Footpath Realignments
	AMB956789A-1200-09 Rev A	Site Clearance
	AMB956789A-1200-10 Rev A	Proposed Drainage Improvements
	AMB956789A-1200-11 Rev A	Vertical Alignment
	AMB956789A-1200-12 Rev A	Cross Sections
	AMB956789A-1200-13 Rev A	Street Lighting

9.	Checklist (tick all that are included and provide reasons for those that are not included)				
9.1.	Road Safety Audit Brief including description of scheme objectives	✓	9.2.	Site Location Plan	✓
9.3.	Scale layout plans	✓	9.4.	Construction/ typical details	✓
9.5.	Previous Road Safety Audit Reports	✓	9.6.	Previous Road Safety Audit Response Reports	✓
9.7.	Road Safety Audit Exception Reports	All Stage 1 RSA recommendations accepted so no Exception Reports	9.8.	Departures and Relaxations from Standards	✓
9.9.	Traffic signal staging	Not included because there are no traffic signals included within the scheme	9.10.	Personal Injury Collision data	✓

9.11.	Personal Injury Collision plot	✓	9.12.	Traffic counts	✓
9.13.	Speed surveys	Not included because it is a new road scheme	9.14.	NMU desire lines and volumes	✓
9.15.	NMU Context and Audit Report	✓	9.16.	Items outside the scope of the RSA/ strategic decisions	✓
9.17.	Other factors that may impact on road safety	✓	9.18.	Design speeds/ speed limits	✓
9.19.	Design Standards used	✓	9.20.	Adjacent land uses	✓

Road Safety Audit Brief Approved By:

Name: Elaine Gain

Position: The Highway Authority Project Sponsor

Signed: Elaine Gain

Date: 7th December 2015

ANNEX F: ILLUSTRATIVE REPORT A795 AMBRIDGE BYPASS ROAD SAFETY AUDIT STAGE 2

EWING AND BARNES PARTNERSHIP

January 2016

1. INTRODUCTION

1.1. This report results from a Stage 2 Road Safety Audit carried out on the A795 Ambridge Bypass at the request of Elaine Gain, the Highway Authority Project Sponsor. The Road Safety Audit was carried out during January 2016.

1.2. The Road Safety Audit Team membership approved by Elaine Gain, the Overseeing Organisation Project Sponsor was as follows:

M Juan	BSc, MSc, CEng, MICE, MCIHT Ewing and Barnes Partnership (Traffic and Collision Investigation Division) (Certificate of Competency in Road Safety Audit gained in December 2013)
Hugh Turner	IEng, FIHE Ewing and Barnes Partnership (Traffic and Collision Investigation Division)
A Rhodes	MEng, CEng, MICE Road Safety Engineering Consultant

1.3. The Road Safety Audit took place at the Erinsborough Office of The Ewing and Barnes Partnership on 16 and 17 January 2016. The Road Safety Audit was undertaken in accordance with the Road Safety Audit Brief provided by Elaine Gain, Project Sponsor, South Midlands Regional Office. The Road Safety Audit comprised an examination of the documents provided and these are listed in the Annex. The documents consisted of a complete set of the draft tender drawings, a summary of the general details of the scheme including traffic flows, predicted queue lengths, Non-Motorised User (NMU) counts, Audit Reports and desire lines, an A3 plan for the Road Safety Audit Team's use, a copy of the Stage 1 Road Safety Audit Report dated November 2012, details of the response to the issues raised in the Stage 1 Road Safety Audit in the form of a Road Safety Audit Response Report, details of other changes to the design since November 2012 and a schedule of Departures from Standards and the relevant approvals contained in the design. The Audit Team visited together the site of the proposed bypass on the morning of 8 January 2016 between 8am and 12pm. During the site visit the weather was fine and sunny and the existing road surface was dry. Traffic conditions were free flowing.

1.4. The terms of reference of the Road Safety Audit are as described in HD 19/15. The Road Safety Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.

1.5. All comments and recommendations are referenced to the detailed design drawings and the locations have been indicated on the A3 plan supplied with the Road Safety Audit Brief.

1.6. The proposed A795 Ambridge Bypass incorporates the provision of 2.3km of 7.3m wide single carriageway between Station Road to the south of the A827 and Ambridge Road to the north east of Ambridge village. The scheme includes the provision of 5 priority junctions and a roundabout at the A827 dual carriageway junction. The improvement also encompasses the provision of two lay-bys, the diversion of a footpath and the stopping up of Old Church Lane. It has been noted from the Road Safety Audit Brief that the strategic decision has been made to switch off the lighting from 12am to 4am between a point 100m north of the A827 junction and 100m south of the A795/bypass. In accordance with paragraph 2.20 of HD 19/15, the Road Safety Audit Team have noted that recommendations to make significant changes to this element of the scheme are unlikely to be acceptable.

1.7. During the Stage 2 Road Safety Audit site visit it was noted that several of the existing lighting columns were not operational during the hours of darkness. Detail regarding this issue which is considered to be outside the scope of this Road Safety Audit has been sent to the Overseeing Organisation Project Sponsor in a covering email to this Road Safety Audit Report. The Maintaining Agent has also been notified of this issue.

2. ITEMS RAISED AT THE STAGE 1 ROAD SAFETY AUDIT

2.1. The road safety aspects of the Ambridge Road Junction were the subject of comment in the November 2012 Stage 1 Road Safety Audit Report. (Items A3.1 and A3.2) These items remain a problem and are referred to again in this Road Safety Audit Report (paragraph 3.13 below).

2.2. All other issues raised in the Stage 1 Road Safety Audit have been resolved.

3. ITEMS RAISED AT THIS STAGE 2 ROAD SAFETY AUDIT

3.1. GENERAL

3.2. PROBLEM

Locations: A and N (drawing AMB956789A-1200-02 Rev C) – Adjacent to the Ambridge railway station.

Summary: Risk of a collision between a pedestrian and a vehicle due to potential shortcut to Bus Stop.

A cross-section Departure from Standard (in that there is no room for provision of a footway) on the existing railway bridge at location A has been reported. The departure has been introduced since the Stage 1 Road Safety Audit. Although pedestrians have been re-routed to cross the railway using the renovated station footbridge, they may still be tempted to use the road bridge as this will provide a much shorter route to the adjacent bus stop (location N). Pedestrians using the road bridge would have to walk on the carriageway and therefore there would be an increased risk of a collision between a vehicle and a pedestrian.

RECOMMENDATION

It is recommended that the bus stop currently on the bypass is relocated to Station Road. In addition it is recommended that pedestrian deterrent paving is provided on the verges on the immediate approaches to the bridge (both sides).

3.3. PROBLEM

Locations: B and C (drawing AMB956789A-1200-02 Rev C) – Northern verge of Home Farm Road.

Summary: Open ditch is a potential hazard to an errant road user and could increase the severity of a collision.

An open ditch is proposed to run along the side of Home Farm Road on the outside of the bend. This ditch is the main outfall for the storm water drainage from much of the bypass and in places is more than 1.5m deep. It is likely to carry substantial quantities of water following heavy rainfall and represents a danger to errant motorists and cyclists. This problem could increase the severity of a collision involving a vehicle or cyclist leaving the carriageway in this location.

RECOMMENDATION

It is recommended that an appropriate safety fence is provided at the back of the grass verge between location B and location C.

3.4. PROBLEM

Locations: D and E (drawing AMB956789A-1200-02 Rev C) – Lay-bys north of Old Church Lane.

Summary: Lay-by positions provide an increased risk of shunt and right turn collisions as road users may attempt to access them from the opposite traffic lane.

Drivers travelling north will reach the lay-by at location D on their right, before the lay-by at location E on their left. Similarly vehicles travelling south will reach the lay-by at E on their right first. Since the lay-bys are not inter-visible and there are no advance signs, drivers could be tempted to cross the carriageway to use the first lay-by that they reach. This problem would increase the number of right turning manoeuvres and therefore increase the potential for collisions between right turning vehicles and vehicles travelling ahead in the opposite direction. It could also increase the likelihood of shunt collisions involving vehicles running into the back of other vehicles waiting to turn right into the lay-by.

RECOMMENDATION

It is recommended that the lay-bys are repositioned so that drivers encounter a lay-by on their nearside first. When relocating the lay-bys ensure that adequate visibility is provided for a driver both entering and leaving the facility. In addition, provide advance signing for both facilities.

3.5. PROBLEM

Location: F (drawing AMB956789A-1200-02 Rev C) – Junction between Old Church Lane and the bypass.

Summary: Downhill gradient and limited visibility on side road approach increases the risk of overshoot type collisions.

The realigned section of Old Church Lane where it meets the bypass has a downhill longitudinal gradient of 7% and limited forward visibility. There is danger of traffic failing to stop at the give way line and skidding into the bypass in bad weather conditions. This feature could result in vehicles on Old Church Lane overrunning the give way line and colliding with through traffic on the bypass.

RECOMMENDATION

It is recommended that the realigned section of Old Church Lane is provided with high friction surfacing and additional signs to warn traffic of the give way junction ahead.

3.6. PROBLEM

Location: G (drawing AMB956789A-1200-02 Rev C) – On the bypass midway between Old Church Lane and Home Farm Road adjacent to the northbound lane.

Summary: Unprotected embankment could increase the severity of a collision involving an errant vehicle in this location.

The safety fence on the west side of the bypass between chainage 1+550 and 1+650 leaves some embankment unprotected. This could increase the severity of a collision involving a vehicle or cyclist leaving the carriageway.

RECOMMENDATION

It is recommended that the safety fence is extended back to chainage 1+500.

3.7. PROBLEM

Locations: H to I (drawing AMB956789A-1200-02 Rev C) – On the bypass adjacent to the Westlee Dairy.

Summary: Headlights of vehicles on the parallel Westlee Dairy access road could distract and disorientate drivers on the bypass potentially resulting in drivers losing control of their vehicles.

The access road to the Westlee Dairy Depot runs parallel to the bypass for about 250m. The Road Safety Audit Team understands that there is considerable vehicular activity on this road at night. The headlights of traffic using this road could be very confusing when viewed from the bypass. This could distract and disorientate drivers on the bypass to the extent they lose control of their vehicles.

RECOMMENDATION

It is recommended that an earth bund, solid fence or similar screen is provided adjacent to the Westlee Dairy boundary.

3.8. PROBLEM

Location: Q (drawing AMB956789A-1200-02 Rev C) – Entrance to the electricity sub-station north of Home Farm Road.

Summary: No provision for service vehicles to stop off the bypass when accessing the sub-station. This could result in parked service vehicles being struck by other road users.

The entrance gates to the electricity sub-station at chainage 1+900 (location Q) are located such that drivers wishing to enter the compound would have to park on the bypass whilst they unlock the gate. This could result in a vehicle travelling on the bypass colliding with the parked vehicle. It could also encourage vehicles to overtake parked vehicles increasing the risk of head-on collisions.

RECOMMENDATION

It is recommended that the gates are relocated further back from the edge of the carriageway. If, however, the location of equipment in the compound precludes the relocation of the gates, it is recommended that a lay-by or hardstanding area is provided to allow vehicles to wait off the road while the gates are being opened or secured.

3.9. THE ALIGNMENT

3.10. PROBLEM

Location: J to L (drawing AMB956789A-1200-03 Rev B) – Crest to the north of Old Church Lane.

Summary: Proposed hazard road marking is not sufficient to discourage drivers from overtaking in this area, this could increase the potential for overtaking collisions.

The entire length of the bypass between the Ambridge Road Junction (location J) and the Bull Roundabout (location L) is marked with hazard road markings (to Traffic Signs Regulations and General Directions diagram 1004.1) indicating the lack of full overtaking sight distance. It is considered that the meaning of this road marking is not well understood by the general public and there is no indication that the visibility reduces appreciably over the crest at chainage 1+250. This problem could increase the potential for collisions involving inappropriate overtaking.

RECOMMENDATION

It is recommended that 1m carriageway hatch road markings (to Traffic Signs Regulations and General Directions diagram 1013.1B) are provided over the crest. The use of this road marking should be coordinated with recommendation 3.13 below.

3.11. THE JUNCTIONS

3.12. PROBLEM

Location: L (drawing AMB956789A-1200-02 Rev C) – North from the Bull Roundabout.

Summary: Confusion over the layout of road north of the roundabout may result in inappropriate overtaking which could lead to head-on conflicts.

Road users originating from the existing dual carriageway A827 Borchester Road (which has a mature Quickthorn hedge in the central reserve) and turning onto the new bypass (northbound) may be confused into thinking that the new bypass is a dual carriageway, particularly as the old field hedge to the west could be assumed to be in a central reserve and concealing a northbound carriageway. Traffic on the access road to the Westlee Dairy could further confuse road users in this location unless the recommendation at paragraph 3.7 above is implemented. This problem could increase the potential for collisions involving vehicles overtaking in an inappropriate location.

RECOMMENDATION

It is recommended that the splitter island and associated hatch markings shown on drawing AMB956789A-1200-02 Rev C are redesigned to emphasise that the bypass is a single carriageway. In addition, it is recommended that two-way traffic signs (to diagram number 521 of The Traffic Signs Regulations and General Directions) are provided on the northbound bypass immediately after the roundabout.

3.13. PROBLEM

Location: J (drawing AMB956789A-1200-03 Rev B) – Northbound approach to Ambridge Road Junction.

Summary: The road layout on the approach to the junction does not discourage overtaking on this straight downhill section of the bypass therefore this could increase the potential for collisions involving overtaking vehicles.

The approach to this junction along the proposed bypass from the south is via a straight downhill section of about 1km length and traffic speeds are likely to be high. The necessity of making sure that overtaking manoeuvres are completed in good time before the central reserve at the junction commences was flagged at the Stage 1 Road Safety Audit. The current design does not adequately address this issue. As a result there is a potential for overtaking collisions and side impact collisions as overtaking vehicles abruptly move back into the northbound lane before the junction.

RECOMMENDATION

(a) It is recommended that a continuous prohibitory double white line road marking to diagram 1013.1 is provided from the southern end of the central reserve (location M drawing AMB956789A-1200-03 Rev B) for a distance of about 340m uphill (FOSD/4 before the nosing), to replace the proposed hazard road marking. This will force drivers into a single lane well before the junction. Coordination with the recommendation in paragraph 3.10 above is recommended.

(b) It is recommended that the advanced direction sign ADS6 is repositioned approximately 150m from the junction to warn traffic travelling at higher speeds.

(c) It is recommended that “SLOW” carriageway road markings are provided on the approaches to the junction from both the north and south direction to moderate speeds through the junction.

(d) It is recommended that hatching is provided within the hard strip to further discourage drivers from attempting to overtake in the short single lane dual carriageway section through the junction.

3.14. NON-MOTORISED USERS (NMUs)

3.15. PROBLEM

Locations: O and P (See drawing AMB956789A-1200-02 Rev C) – Former line of the footpath at the crest to the north of Old Church Lane.

Summary: The former footpath alignment may still attract pedestrians to cross at a location with limited visibility. This could result in an increased potential for a collision between a vehicle and pedestrian.

The scheme allows for the diversion of Footpath No. 12 so that it crosses the bypass away from the crest curve at location K. The old route may, however, be more attractive to pedestrians. This could result in a collision between a vehicle and pedestrian due to the reduced visibility at the crest curve.

RECOMMENDATION

It is recommend that the landscaping is modified with heavy planting to block the old route at the edge of the bypass (location O) and remove the old stile at the field boundary (location P) and replace with solid wall to match existing.

3.16. PROBLEM

Location: Throughout the length of the bypass.

Summary: The proposed raised ribbed edge line road marking may potentially be hazardous to cyclists at junctions causing loss of control incidents.

It is not uncommon for cyclists to use the marginal strip provided along busy bypasses to avoid being intimidated by other vehicles. The drawings indicate that road markings to Diagram 1012.3, raised ribbed markings, will be used as edge line markings. These markings may cause difficulties for cyclists entering or leaving the marginal strip near junctions and result in cyclists losing control of their bicycle.

RECOMMENDATION

It is recommended that road markings to Diagram 1012.3 are replaced by those to Diagram 1012.1 for a length of 20m on the approach and exit sides of any junction.

3.17. SIGNING AND LIGHTING

3.18. PROBLEM

Location: L (drawing AMB956789A-1200-02 Rev C) – westbound approach to the Bull Roundabout.

Summary: The proposed positioning of a lighting column could increase the risk of errant vehicles colliding with the lighting column located in front of the safety fence.

On the A827 Borchester Road dual carriageway approach to the Bull Roundabout a length of safety fence is proposed to protect a large advance direction sign in the nearside verge. The drawings provided show a lighting column approximately 60 metres from the roundabout, located in front of the proposed safety fence. An errant vehicle leaving the carriageway in this location could run along the length of the safety fence into the lighting column, therefore this could significantly increase the severity of a collision occurring in this location.

RECOMMENDATION

It is recommended that the proposed lighting column is relocated behind the length of safety fence.

4. AUDIT TEAM STATEMENT

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

ROAD SAFETY AUDIT TEAM LEADER

M Juan BSc, MSc, CEng, MICE, MCIHT
Principal Highway Engineer
Traffic and Collision Investigation Division
Ewing and Barnes Partnership
Albert Square Erinsborough Rutland

Signed M Juan

Date 31/01/16

ROAD SAFETY AUDIT TEAM MEMBERS

Hugh Turner IEng, FIHE
Senior Engineer
Traffic and Collision Investigation Division
Ewing and Barnes Partnership
Albert Square
Erinsborough
Rutland

Signed Hugh Turner

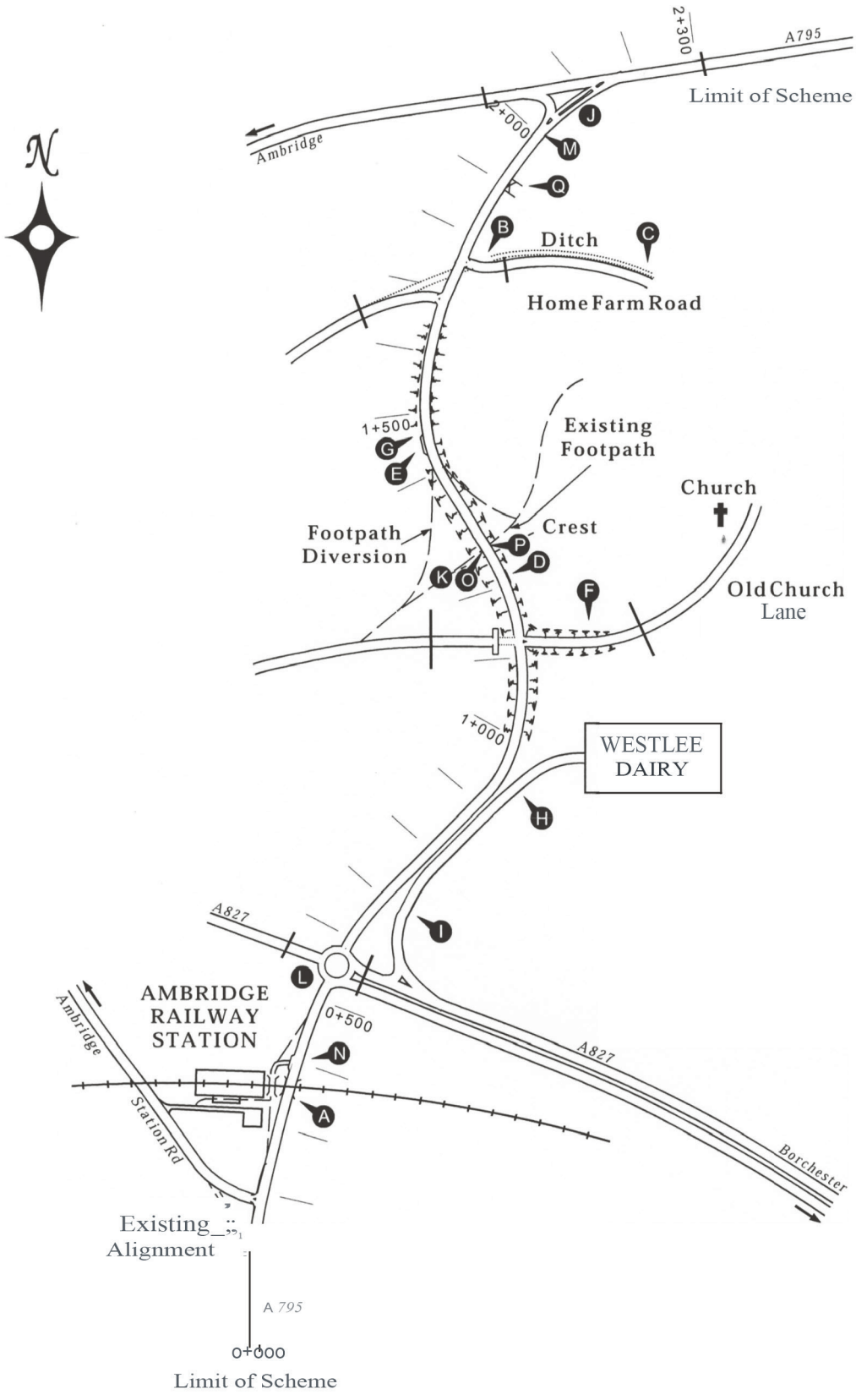
Date 31/01/16

A Rhodes CEng, MICE
Road Safety Engineering Consultant
5 Brookside
Post Green
Wessex

Signed A Rhodes

Date 31/01/16

AMBRIDGE BYPASS



ANNEX G: ILLUSTRATIVE REPORT A795 AMBRIDGE BYPASS ROAD SAFETY AUDIT STAGE 4 12 MONTH MONITORING REPORT

DLS PARTNERSHIP

February 2019

1 INTRODUCTION

1.1. This Road Safety Audit Report results from the Road Safety Audit Stage 4 – 12 month monitoring carried out on the A795 Ambridge Bypass Scheme as part of DLS Partnership (Road Safety Division) maintenance agreement with The Highway Authority. The Road Safety Audit Report has been produced as part of a routine collision monitoring/Road Safety Audit procedure and the terms of reference for this monitoring report are described in HD 19/15. The Road Safety Audit has also been undertaken in accordance with the Road Safety Audit Brief provided by Elaine Gain, Project Sponsor, South Midlands Regional Office.

1.2. The Road Safety Audit Team membership, approved by Elaine Gain, the Overseeing Organisation Project Sponsor was as follows:

Zach Wilmot	BSc, MSc, CEng, MICE, MCIHT DLS Partnership (Road Safety Division) (Certificate of Competency in Road Safety Audit gained in December 2013)
Jake Holly	IEng, FIHE DLS Partnership (Road Safety Division)

1.3. A site visit was conducted by both Road Safety Audit Team Members together on 1st February 2019, during which the road surface was wet as it was raining heavily. Traffic was free flowing.

2 SCHEME DETAILS

2.1. The A795 Ambridge Bypass was completed in November 2017 and involved the provision of 2.3km of 7.3m wide single carriageway between Station Road to the south of the A827 and Ambridge Road to the north east of Ambridge village.

2.2. The scheme included the provision of 5 priority junctions and a roundabout at the A827 dual carriageway. The improvement also encompassed the provision of two lay-bys, the diversion of a footpath and the stopping up of Old Church Lane.

2.3. The scheme was subjected to a Stage 1 Road Safety Audit in November 2012, a Stage 2 Road Safety Audit in January 2016 and a Stage 3 Road Safety Audit prior to opening in November 2017.

3. ANALYSIS OF COLLISIONS

3.1. During the period 1st December 2017 to 30th November 2018 a total of 3 personal injury collisions were recorded throughout the 2.3km length of the scheme. The severity of all three collisions was slight.

3.2 The collision frequency on Ambridge bypass has been briefly compared with values predicted in the Design Manual for Roads and Bridges COBA manual. The COBA manual predicts a collision frequency of 3.48 collisions a year based on the Annual Average Daily Traffic (AADT) flow of 24000 vehicles in 2015.

3.3 All three collisions have occurred at different locations throughout the scheme. The location and a brief description of each collision has been included below:

- Collision Ref. 1 – A827/A795 roundabout. Vehicle 1 from A827 fails to give way at roundabout and runs into vehicle 2.
- Collision Ref. 2 – N/bound approach to Old Church Lane. M/cycle loses control on a patch of oil.
- Collision Ref. 3 – S/bound lay-by north of Old Church Lane. Vehicle 2 travelling north waiting to turn right into lay-by struck in rear by vehicle 1.

3.4 Two of the collisions (references 2 and 3) occurred during the daytime in fine weather on a dry road surface. The remaining collision (reference 1) occurred during the daytime in a period of rain on a wet road surface.

4. TRAFFIC CONDITIONS

4.1. Traffic count data has been obtained from an Automatic Traffic Counter (ATC) located on the A795 north of Home Farm Lane. The ATC indicates that the traffic flows along the A795 are 24000 vehicles AADT in 2018.

4.2. No significant congestion has been recorded throughout the scheme in its first year of opening. However, some queuing has been observed on the A827 westbound approach to the A827/A795 roundabout during the am peak period.

5. CONCLUSIONS

5.1. A brief assessment of the 12-month collision history of the Ambridge Bypass has indicated that the collision frequency is lower than the predicted national average and no common factors or trends have been identified in the collision data. However, it has been noted that one of the three collisions that have occurred has resulted from a vehicle travelling northbound waiting to turn right into the southbound lay-by being struck from behind. This problem was raised in the Stage 2 Road Safety Audit Report, however the Design Team and Project Sponsor did not consider this to be a significant issue and dealt with it in the Road Safety Audit Response Report and an Exception Report.

As this Road Safety Audit Report considers only 12 months of collision data and no common factors or trends have been identified at this early stage, no firm conclusions can be drawn from the collision information.

ANNEX H: ILLUSTRATIVE REPORT A795 AMBRIDGE BYPASS ROAD SAFETY AUDIT STAGE 4 36 MONTH MONITORING REPORT

DLS Partnership **January 2021**

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1 INTRODUCTION

1.1 Background to the study

1.1.1 This Road Safety Audit Report results from the Road Safety Audit Stage 4 – 36 month monitoring carried out on the A795 Ambridge Bypass Scheme as part of DLS Partnership (Road Safety Division) maintenance agreement with The Highway Authority. The Road Safety Audit Report has been produced as part of a routine collision monitoring/Road Safety Audit procedure and the terms of reference for this monitoring report are described in HD 19/15. The Road Safety Audit has also been undertaken in accordance with the Road Safety Audit Brief provided by Elaine Gain, Project Sponsor, South Midlands Regional Office.

1.1.2 The Road Safety Audit Team membership, approved by Elaine Gain, the Overseeing Organisation Project Sponsor was as follows:

Zach Wilmot	BSc, MSc, CEng, MICE, MCIHT DLS Partnership (Road Safety Division) (Certificate of Competency in Road Safety Audit gained in December 2013)
Jake Holly	IEng, FIHE DLS Partnership (Road Safety Division)

1.1.3 A site visit was conducted by both Road Safety Audit Team Members together on 4th February 2021, during which the weather was overcast and the road surface was dry. Traffic conditions were free flowing.

2.1 Study purpose

2.1.1 The purpose of this study is as follows:

- to undertake an in-depth study of the collisions that have occurred on the scheme during the three years since opening;
- to identify any road collision problems;
- to suggest possible measures that would contribute to collision reduction on the scheme.
- to review the recommendations from the Road Safety Audit Reports at Stages 1 to 3, the Road Safety Audit Response Reports and the Exception Reports to identify if they had any effect on the scheme.

3 SCHEME DETAILS

3.1 Description of the scheme

3.1.1 The A795 Ambridge Bypass was completed in November 2017 and involved the provision of 2.3km of 7.3m wide single carriageway between Station Road to the south of the A827 and Ambridge Road to the north east of Ambridge village.

3.1.2 The scheme included the provision of 5 priority junctions and a roundabout at the A827 dual carriageway. The improvement also encompassed the provision of two lay-bys, the diversion of a footpath and the stopping up of Old Church Lane.

3.1.3 The scheme is subject to the national speed limit with the exception of the A827/A795 Bull Roundabout and Home Farm Road, Old Church Lane and Station Road, which all have a 30mph posted speed limit. The scheme includes areas of street lighting. However, areas of the street lighting are switched off between 12am and 4am.

3.1.4 The scheme was subjected to a Stage 1 Road Safety Audit in November 2012, a Stage 2 Road Safety Audit in January 2016, a Stage 3 Road Safety Audit prior to opening in November 2017 and a Stage 4 12 month monitoring Road Safety Audit in February 2019.

4 ANALYSIS OF COLLISIONS

4.1.1 During the 36 month period between 1st December 2017 to 30th November 2020 a total of 11 personal injury collisions were recorded throughout the 2.3km length of the scheme. There have been 2 (18%) serious collisions and 9 (82%) collisions that were slight in severity. No collisions involving fatalities have been recorded during the 36 month period. These figures are generally consistent with national average values taken from the DfT publication "Reported Road Causalities in Great Britain Annual Report" (RRCGB) which indicates that on major roads with a 60mph speed limit 4% of collisions were fatal, 21% were serious and 75% were slight in severity.

4.1.2 Stick diagrams for these collisions together with a breakdown of collision types are included in Appendix I of this Stage 4 Road Safety Audit Report.

4.1.3 Appendix II of this Stage 4 Road Safety Audit Report shows a plot of the location of each of the collisions. Generally this diagram shows that the collisions are evenly distributed throughout the scheme. However, there is a cluster of 4 collisions at the A827/A795 roundabout and two collisions at the lay-by north of Old Church Lane.

4.1.4 The information contained in the collision data has been compared to national averages from the DfT publication "Reported Road Causalities in Great Britain Annual Report" (RRCGB) and the "Design Manual for Roads and Bridges COBA manual" below and in Appendices III to V:

4.1.5 Collision Frequency (see Appendix III)

	Year (01/12/17 to 30/11/20)			Total
	2017/2018	**2018/2019**	**2019/2020**	
NUMBER OF COLLISIONS	3	3	5	11

4.1.6 The above table indicates that there have been on average 3.67 personal injury collisions a year along the Ambridge bypass. The COBA manual predicts a collision frequency of 3.76 a year based on the year 2019 AADT traffic flow of 24000 vehicles.

4.1.7 Collisions by Weather, Road Surface and Light Conditions (see Appendices IV & V)

Weather Conditions	Ambridge Bypass		National Average (RRCGB)	
	No. of Collisions	%	No. of Collisions	%
Fine	8	73%	40173	75%
Rain	3	27%	10568	20%
Snow	0	0%	338	1%
Fog	0	0%	580	1%
Unknown	0	0%	1726	3%
Total	**11**	**100%**	**53385**	**100%**

Road Surface Conditions	Ambridge Bypass		National Average (RRCGB)	
	No. of Collisions	%	No. of Collisions	%
Dry	7	64%	27660	52%
Wet	4	36%	23301	44%
Snow/Ice	0	0%	1751	3%
Unknown	0	0%	673	1%
Total	**11**	**100%**	**53385**	**100%**

Light Conditions	Ambridge Bypass		National Average (RRCGB)	
	No. of Collisions	%	No. of Collisions	%
Daylight	8	73%	38788	73%
Darkness	3	27%	14597	27%
Total	**11**	**100%**	**53385**	**100%**

4.1.8 The above tables indicate that the weather conditions, road surface conditions and lighting conditions recorded in the collision data for the Ambridge bypass are generally consistent with national averages for 2019. Statistical tests carried out for the weather, road surface and lighting condition information indicate that there are no significant differences between the site data recorded in the personal injury collision reports and national data.

4.1.9 Collisions by Manoeuvre

Manoeuvre	No. of Collisions	%
Loss of Control	2	18%
Side Impact – failed to give way	2	18%
Nose to tail shunt impact	4	37%
Side Impact – Changing lanes	2	18%
Car hit Pedestrian	1	9%
Total	**11**	**100%**

4. TRAFFIC CONDITIONS

4.1. Traffic Flows

4.1.1. Traffic count data has been obtained from an Automatic Traffic Counter (ATC) located on the A795 north of Home Farm Lane. The ATC indicates that the traffic flows along the A795 in 2020 were 24,500 vehicles AADT. This compares to the AADT flow recorded in 2017 of 24,000 vehicles.

4.1.2. The daily flow profile suggests that the Ambridge bypass has pronounced peaks in both the AM and PM periods and the traffic volumes are tidal, the high volumes occur in the southbound direction in the AM period and in the northbound direction in the PM period.

4.2. Traffic Speeds

4.2.1. Traffic speeds were measured during January 2021 and the results are shown below:

Location of survey	Southbound		Northbound	
	85% ile speed (mph)	Speed range (mph)	85% ile speed (mph)	Speed range (mph)
100m South of Old Church Ln	52	41 – 65	51	41 – 62
100m North of Old Church Ln	54	44 – 66	55	40 – 66

4.2.2. The results show that speeds along the Ambridge Bypass are typical of those with a 60mph speed limit. A small proportion of drivers exceed the speed limit by more than 5mph.

4.2.3. No significant congestion has been recorded throughout the scheme. However, some queuing has been observed on the A827 westbound approach to the A827/A795 roundabout during the am peak period. This congestion generally occurs between 08:30 and 09:00 in the morning on weekdays and extends for a length of approximately 15 vehicles in each lane.

5. STATEMENT OF ROAD SAFETY PROBLEMS ON THE AMBRIDGE BYPASS

5.1. Problems Identified

5.1.1. Although the collision rate along the Ambridge bypass is consistent with the national average for the type of road, this study has shown that there are a number of specific safety problems along the route:

- Two collisions on the A827 dual carriageway approach have involved drivers failing to appreciate the A827/A795 roundabout.
- Two collisions at the A827/A795 roundabout have involved car drivers exiting the junction across the path of cyclists.
- A cluster of two collisions has occurred at the lay-by north of Old Church Lane.

5.2. Review of Previous Road Safety Audit Reports, Road Safety Audit Response Reports and Exception Reports

5.2.1. None of the previous Road Safety Audits raised a specific problem in respect of either the potential for collisions involving drivers approaching from the A827 not appreciating the A827/A795 roundabout or for collisions involving car drivers exiting the junction across the path of cyclists. However, the potential for collisions involving vehicles turning right into the lay-by to the north of Old Church Lane was identified in the Stage 2 Road Safety Audit.

5.2.2. The following problem and recommendation was raised in the Stage 2 Road Safety Audit Report:

PROBLEM

Locations: D and E (drawing AMB936789A-1200-02 Rev C) – Lay-bys north of Old Church Lane.
Summary: Lay-by positions provide an increased risk of shunt and right turn collisions.

Drivers travelling north will reach the lay-by at location D on their right before the lay-by at location E on their left. Similarly vehicles travelling south will reach the lay-by at E on their right first. Since the lay-bys are not inter-visible and there are no advance signs drivers could be tempted to cross the carriageway to use the first lay-by that they reach. This problem would increase the number of right turning manoeuvres and therefore increase the potential for collisions between right turning vehicles and vehicles travelling ahead in the opposite direction. It could also increase the likelihood of shunt collisions involving vehicles running into the back of other vehicles waiting to turn right into the lay-by.

RECOMMENDATION

It is recommended that the lay-bys are repositioned so that drivers encounter a lay-by on their nearside first. When relocating the lay-bys ensure that adequate visibility is provided for a driver both entering and leaving the facility. In addition, provide advance signing of both facilities.

5.2.3. The recommendation of repositioning the lay-bys was not implemented by the Project Sponsor as it would involve the costly acquisition of third party land and therefore an Exception Report was prepared by the Project Sponsor and approved by the Director. However, in mitigation the design was amended to include the provision of signing of the lay-bys ½ mile in advance of each of the facilities.

6. OPTIONS FOR TREATMENT

6.1. Collision occurring on the A827 dual carriageway approach to the A827/A795 roundabout

6.1.1. Two of the collisions that have occurred on the A827 westbound approach to the roundabout appear to have involved a driver travelling too fast or not comprehending the junction layout ahead. A remedial measure option to reduce this problem would be to provide transverse yellow bar markings on this approach. This road marking has been shown to have a significant effect in reducing collisions associated with inappropriate approach speeds.

6.1.2. Economic Assessment

The cost of providing transverse yellow bar markings is estimated to be £4,000. A study undertaken by the TRL (1) has shown that this improvement could result in an overall reduction in speed related collisions in the order of 57% on fast dual carriageway approaches to junctions. However, the TRL study does identify that the collision saving in relation to collisions occurring during the hours of darkness would be less. Therefore, as one of the two collisions on the A827 westbound approach to the junction has been during the hours of darkness a collision saving of 25% has been assumed. Therefore, this measure could provide a saving of 0.17 collisions per year, which is equivalent to £18,697 based on the national average cost of £109,983 for an injury collision.

6.1.3. The First Year Rate of Return (FYRR) for this improvement is estimated at 467%.

6.2. Collisions Involving Cyclists at the A827/A795 Roundabout

6.2.1. Two of the four collisions that have occurred at this junction have involved car drivers leaving the roundabout across the path of cyclists negotiating the circulatory carriageway. Site observations have indicated that numerous cyclists use the roundabout to access the Westlee Dairy from the residential areas to the west and south. It is therefore recommended that a segregated off-road route is provided around the junction to assist these vulnerable road users.

6.2.2. Economic Assessment

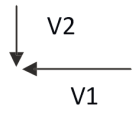
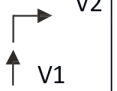
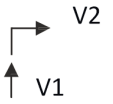
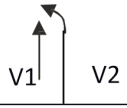
The estimated cost of providing a segregated cycle track/footpath around the junction would be £60,000. previous studies undertaken by this Road Safety Audit Team indicate that cycle schemes have produced a 58% reduction of injury collisions overall. As some cyclists will continue to use the circulatory carriageway, it is estimated that this improvement could save 50% of the collisions involving cyclists coming into conflict with motorised vehicles on the carriageway. Therefore this measure could provide a saving of 0.33 collisions per year, which is equivalent to £36,294 based on the national average cost of £109,983 for an injury collision.

7. CONCLUSIONS

7.1.1. An analysis carried out on the 36 month period 1st December 2017 to 30th November 2020 has revealed a total of 11 reported personal injury collisions.

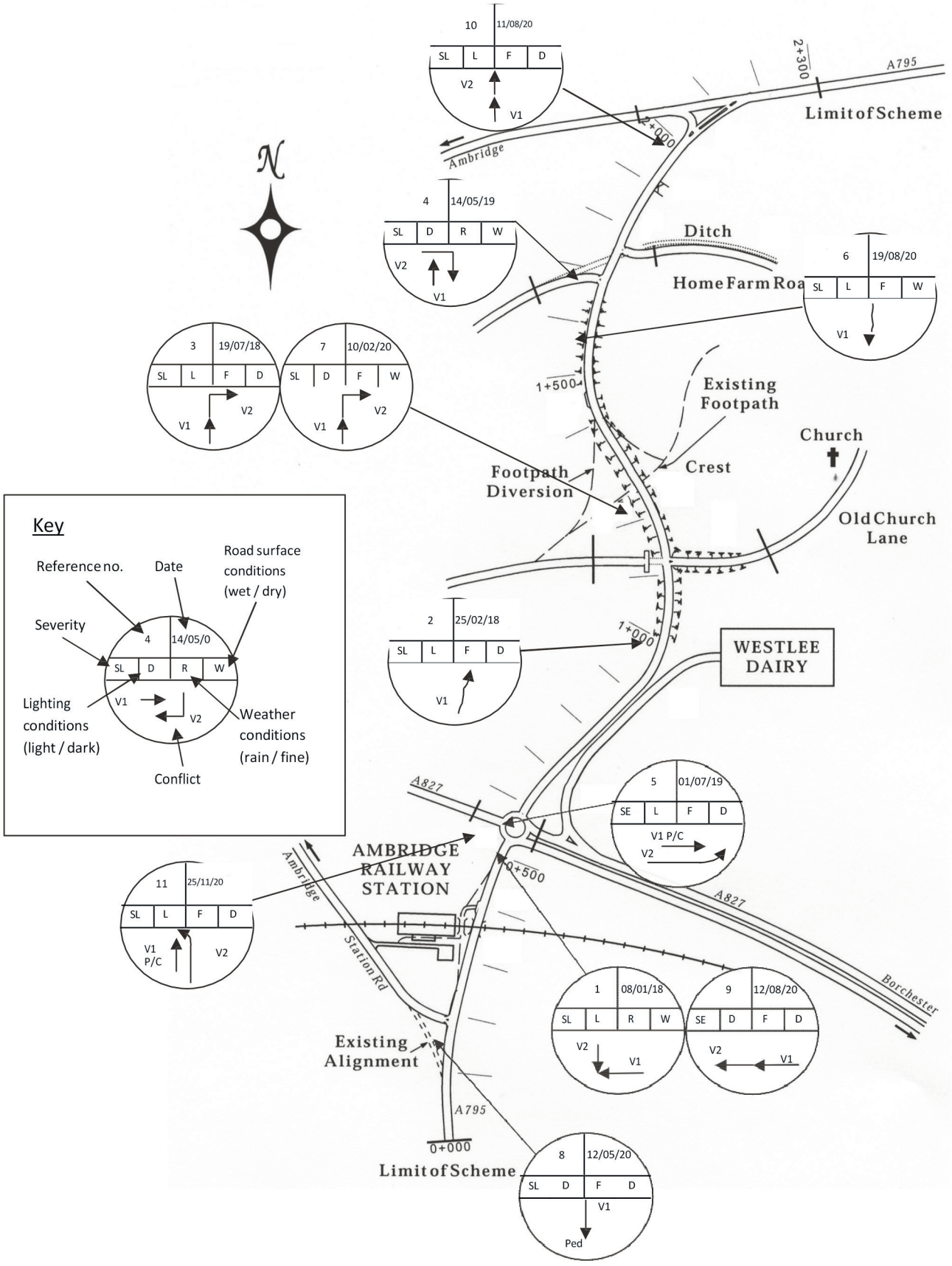
7.1.2. The study has shown that there are a number of specific road safety problems on the route and that there are several options for treatment. As all the measures considered give a high First Year Rate of Return it is recommended that all are considered for implementation.

Appendix I – Collision Record 1st December 2017 to 30th November 2020

Reference:	1	2	3	4	5	6	7	8	9	10	11
Collision No.	T39195	T12495	T56395	T32196	T22396	T34596	T43196	T55296	T11297	T37897	T56797
Year	2018	2018	2018	2019	2019	2019	2020	2020	2020	2020	2020
Month	January	February	July	May	July	August	February	May	August	August	November
Date	8	25	19	14	1	19	10	12	12	11	25
Day	Friday	Wednesday	Friday	Sunday	Saturday	Saturday	Saturday	Saturday	Monday	Friday	Saturday
Time	10:40:00	09:10:00	13:15:00	19:25:00	16:10:00	12:15:00	15:15:00	21:20:00	16:45:00	11:15:00	17:00:00
Severity	Slight	Slight	Slight	Slight	Serious	Slight	Slight	Slight	Serious	Slight	Slight
Dark/Light	Light	Light	Light	Dark	Light	Light	Light	Dark	Dark	Light	Light
Weather	Rain	Fine	Fine	Rain	Fine	Fine	Rain	Fine	Fine	Fine	Fine
Road Surface	Wet	Dry	Dry	Wet	Dry	Wet	Wet	Dry	Dry	Dry	Dry
No. Vehicles	2	1	2	2	2	1	2	1	2	2	2
Vehicle 1	Car	M/C	Car	M/C	P/C	Car	Car	Car	Car	Car	P/C
Vehicle 2	Van		Car	Car	Car		Van		Van	Car	Car
Vehicle 3											
No. Casualties	1	1	2	1	1	1	1	1	2	1	1
Casualty 1	Driver V1 Male 25	Rider V1 Male 34	Passenger V2 Female 54	Rider V1 Male 27	Rider V1 Male 54	Passenger V2 Female 65	Driver V2 Male 32	Pedestrian V1 Male 22	Driver V1 Male 23	Driver V1 Male 72	Rider V1 Female 48
Casualty 2			Driver V1 Male 43						Driver V2 Male 44		
Causation	Veh 1 failed to give way and pulled out across path of veh. 2	Rider lost control of machine on oil patch	Veh. 2 waiting to turn right into Lay-by, veh 1 skids into rear	Veh 2 turns right out from junction in path of motor cycle	V2 exits rbt to A795 across path of P/C V1 negotiating cir/cway	Veh. 1 lost control – distracted by passenger	Veh. 1 skids into rear of Veh. 2 turning right into lay-by	Ped. drunk in road hit by car	Veh 1 runs into the back of Veh 2 on approach to junction	Veh 1 runs into the back of Veh 2 on approach to junction	V2 exits rbt to A827 across path of P/C V1 negotiating cir/cway
Manoeuvre											
Location	A827/A795 Rbt	N/B approach to Old Church Lane	S/B lay-by north of Old Church Lane	A795/Home Farm Road Junction	A827/A795 Rbt	South of Home Farm Road	S/B lay-by north of Old Church Lane	South of Station Road	A827/A795 Rbt	A795 Ambridge Rd junction	A827/A795 Rbt

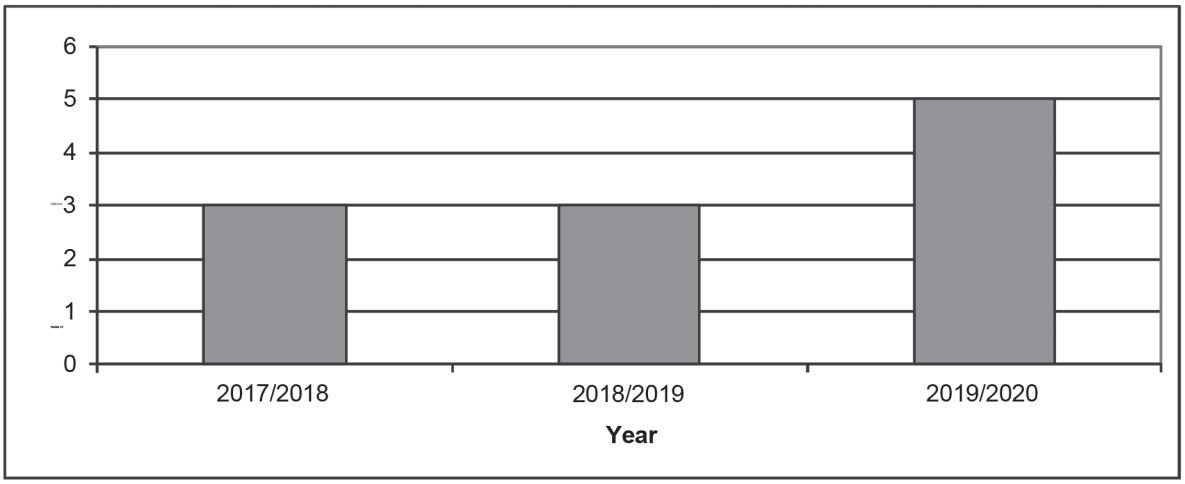
Appendix II – Collision Plot 1st December 2017 to 30th November 2020

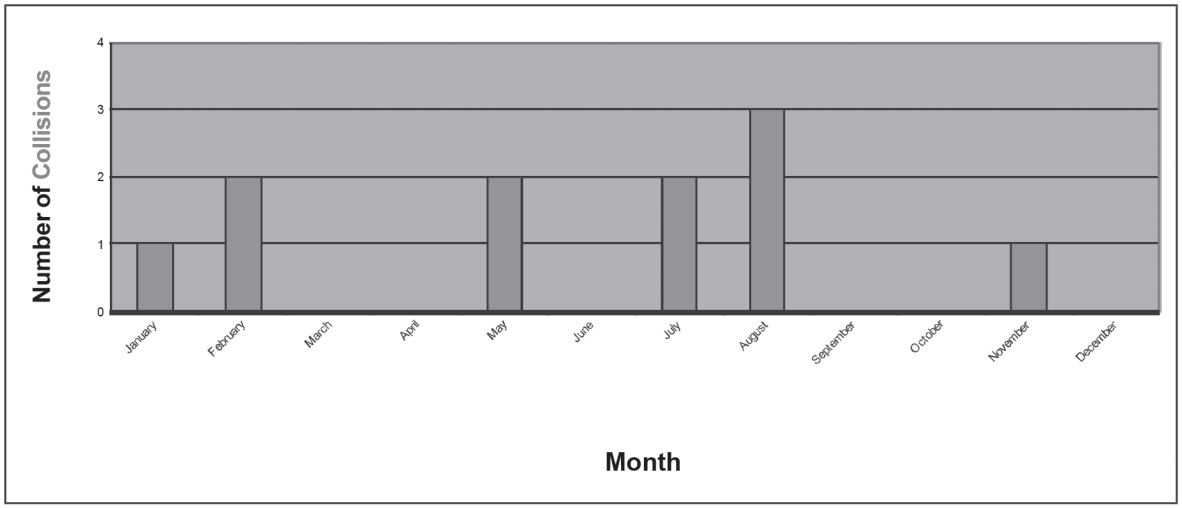
AMBRIDGE BYPASS

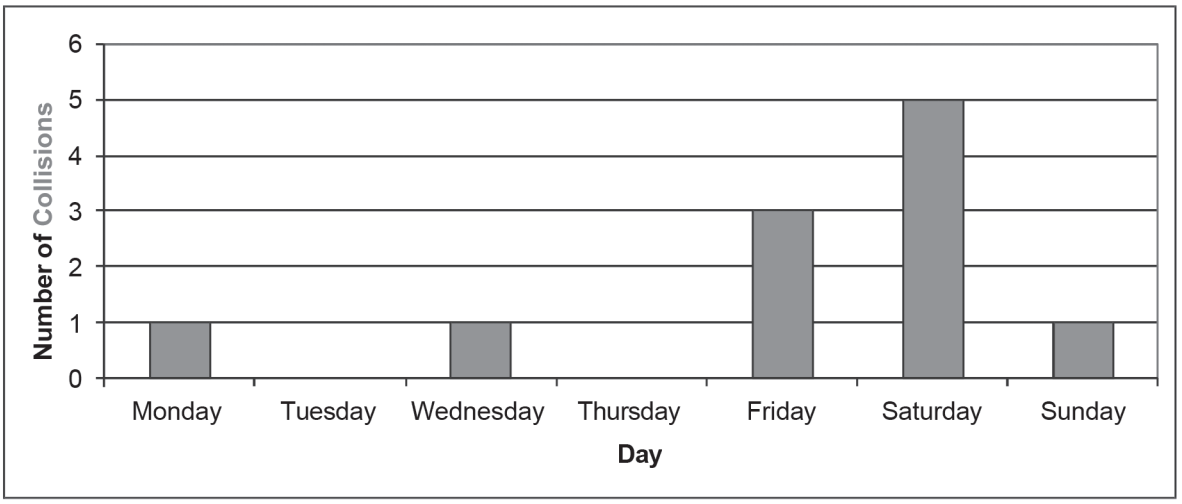


Appendix III – Collision Frequency by Year, Month & Day of Week

Ambridge Bypass from 01/12/2017 to 30/11/2020

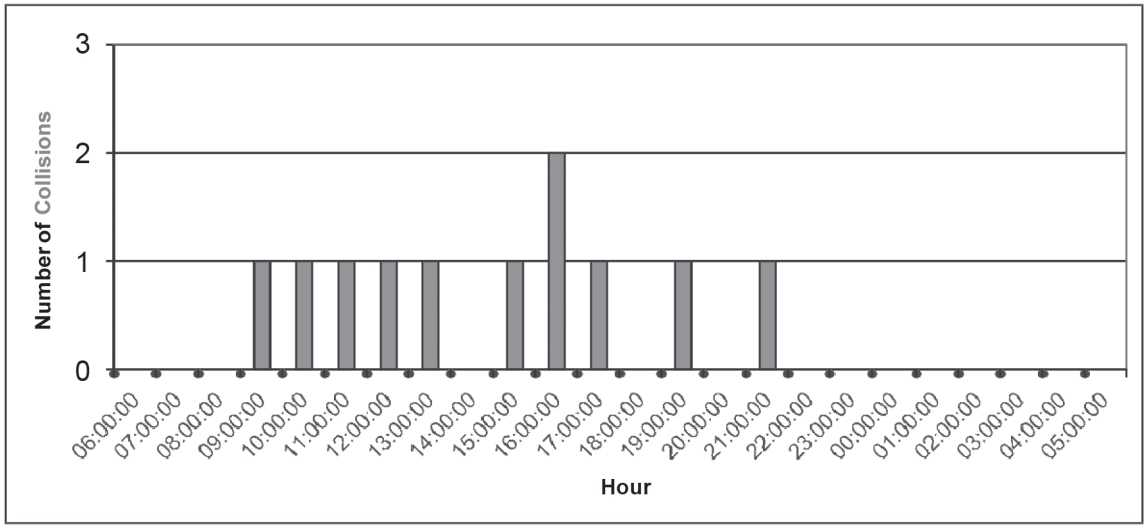


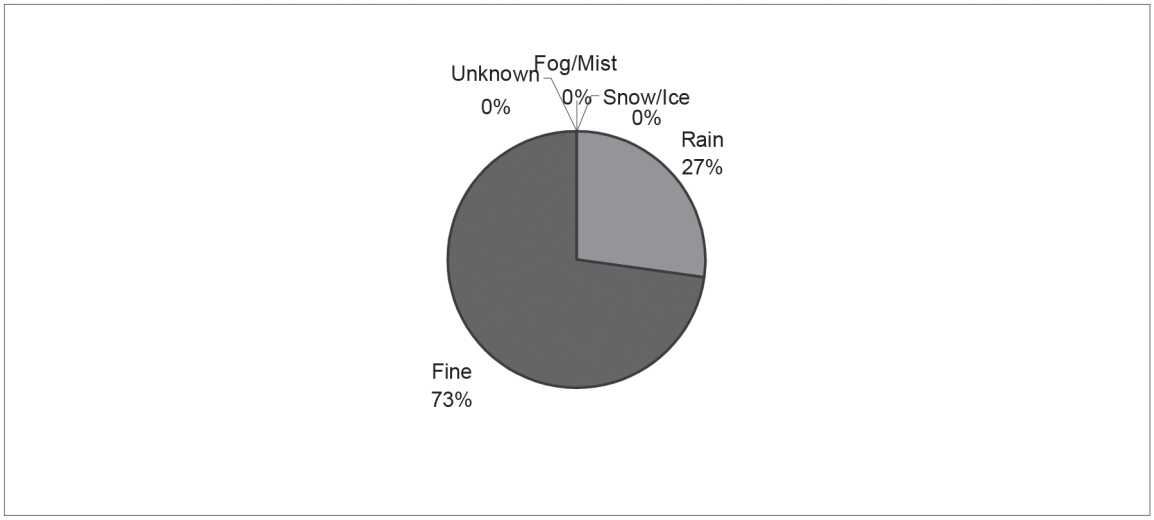


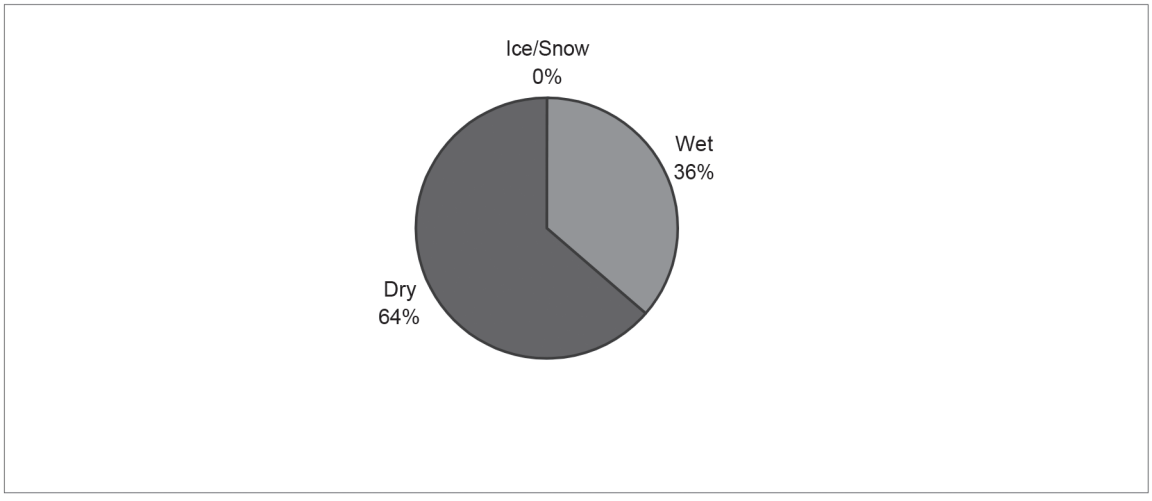


Appendix IV – Collision Frequency by Hour of the Day, Weather Conditions & Road Surface Conditions

Ambridge Bypass from 01/12/2017 to 30/11/2020

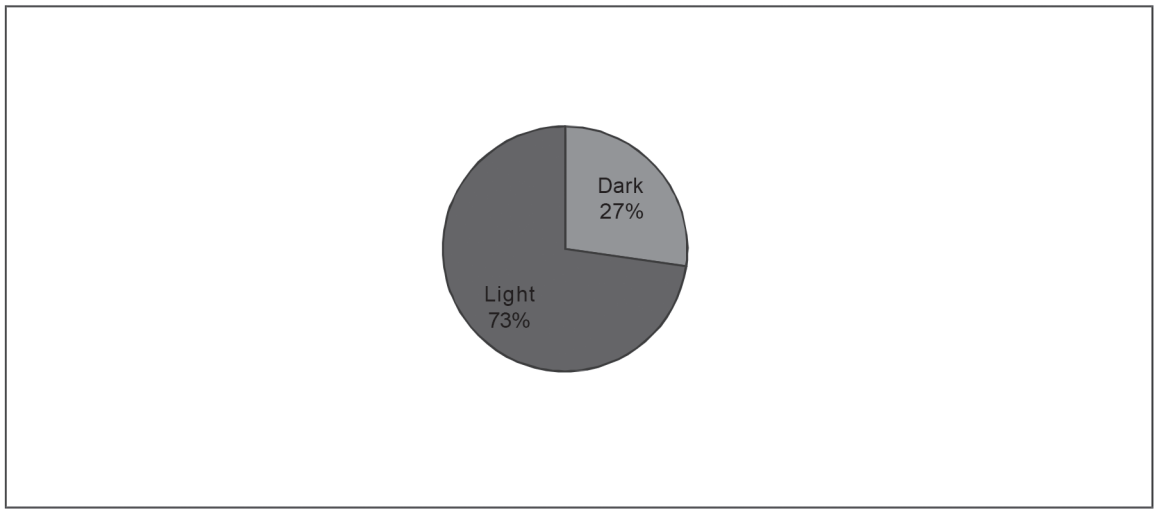






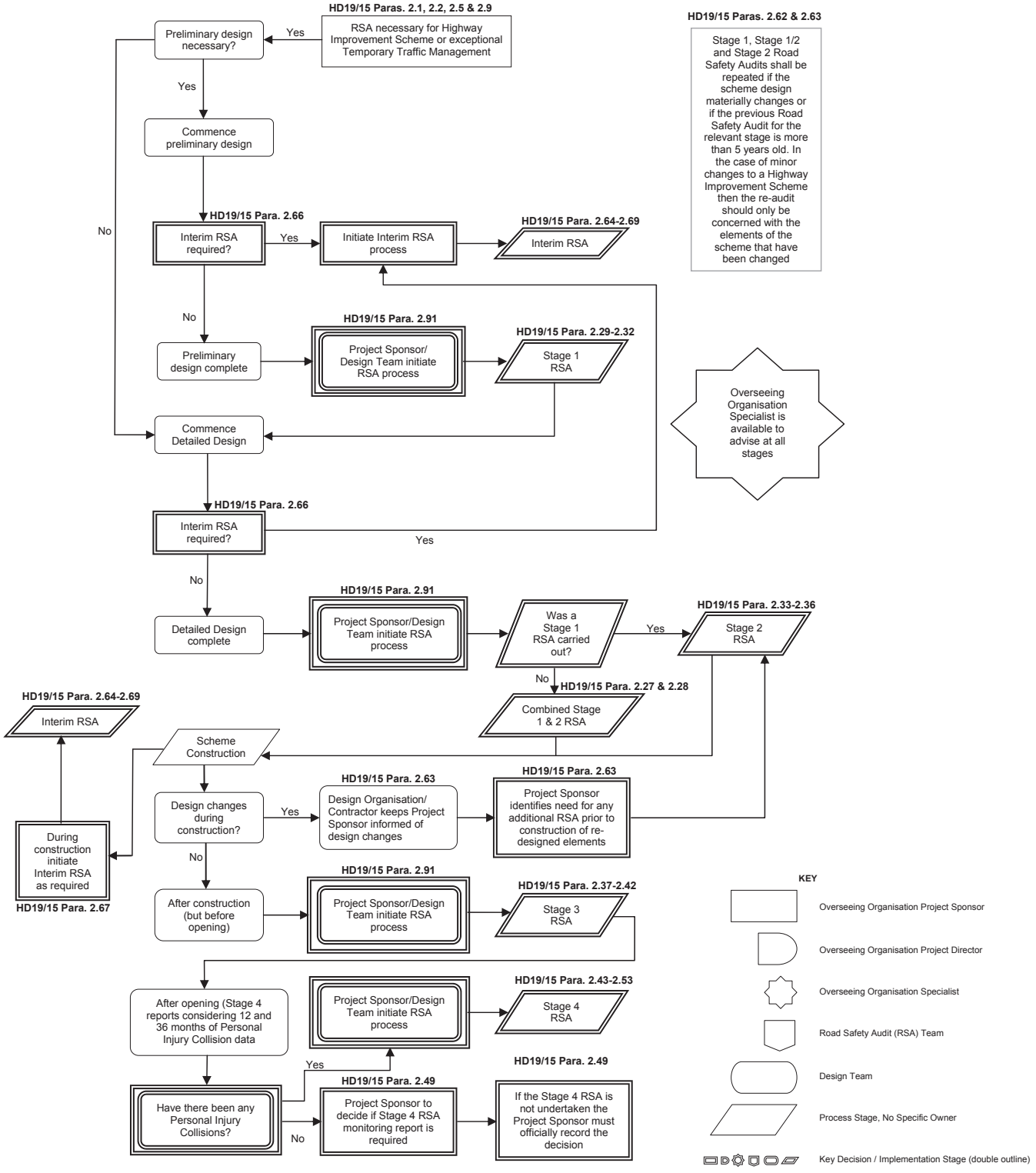
Appendix V – Collisions by Light Conditions

Ambridge Bypass from 01/12/2017 to 30/11/2020

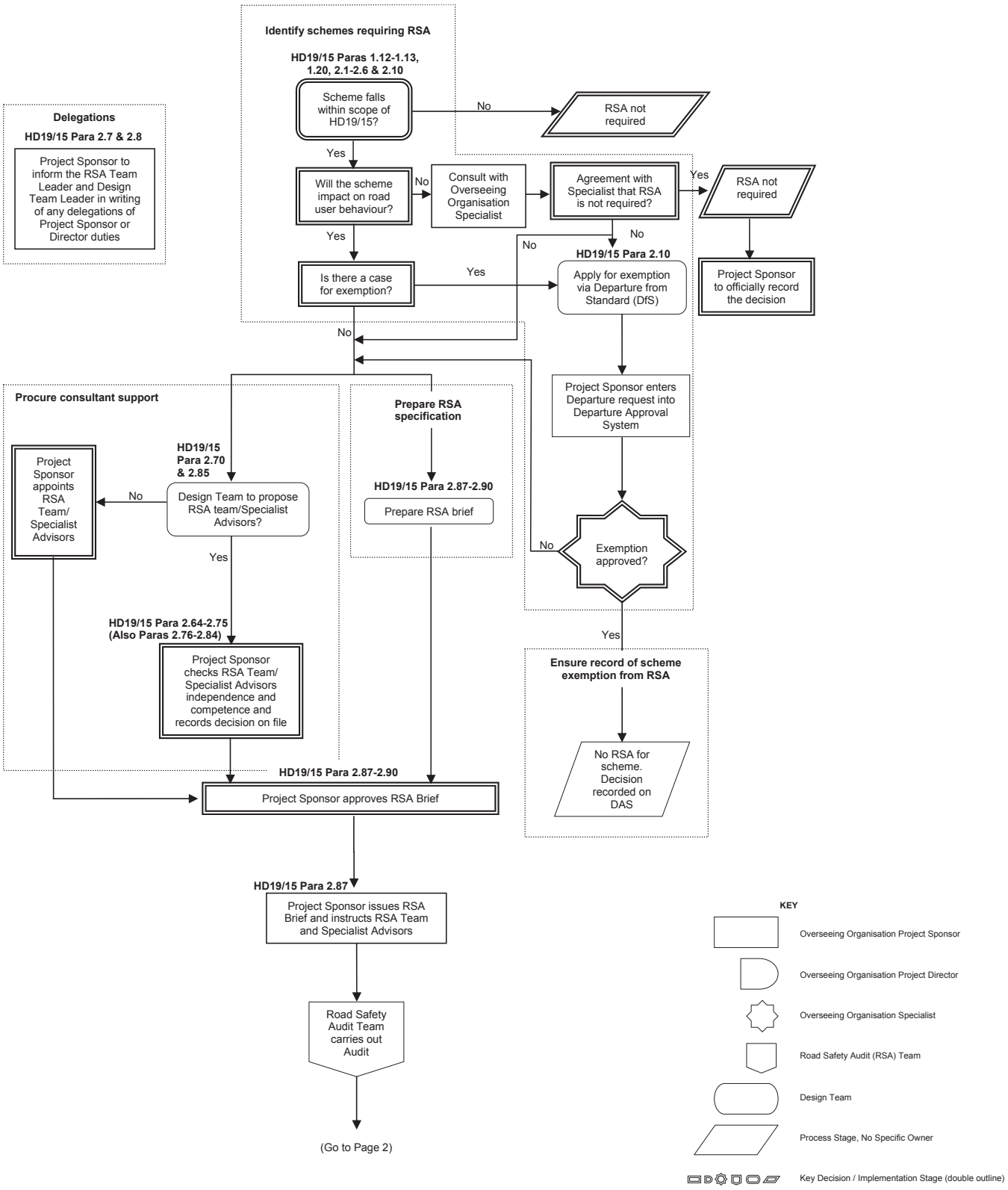


ANNEX I: ROLES AND RESPONSIBILITIES FLOW CHARTS

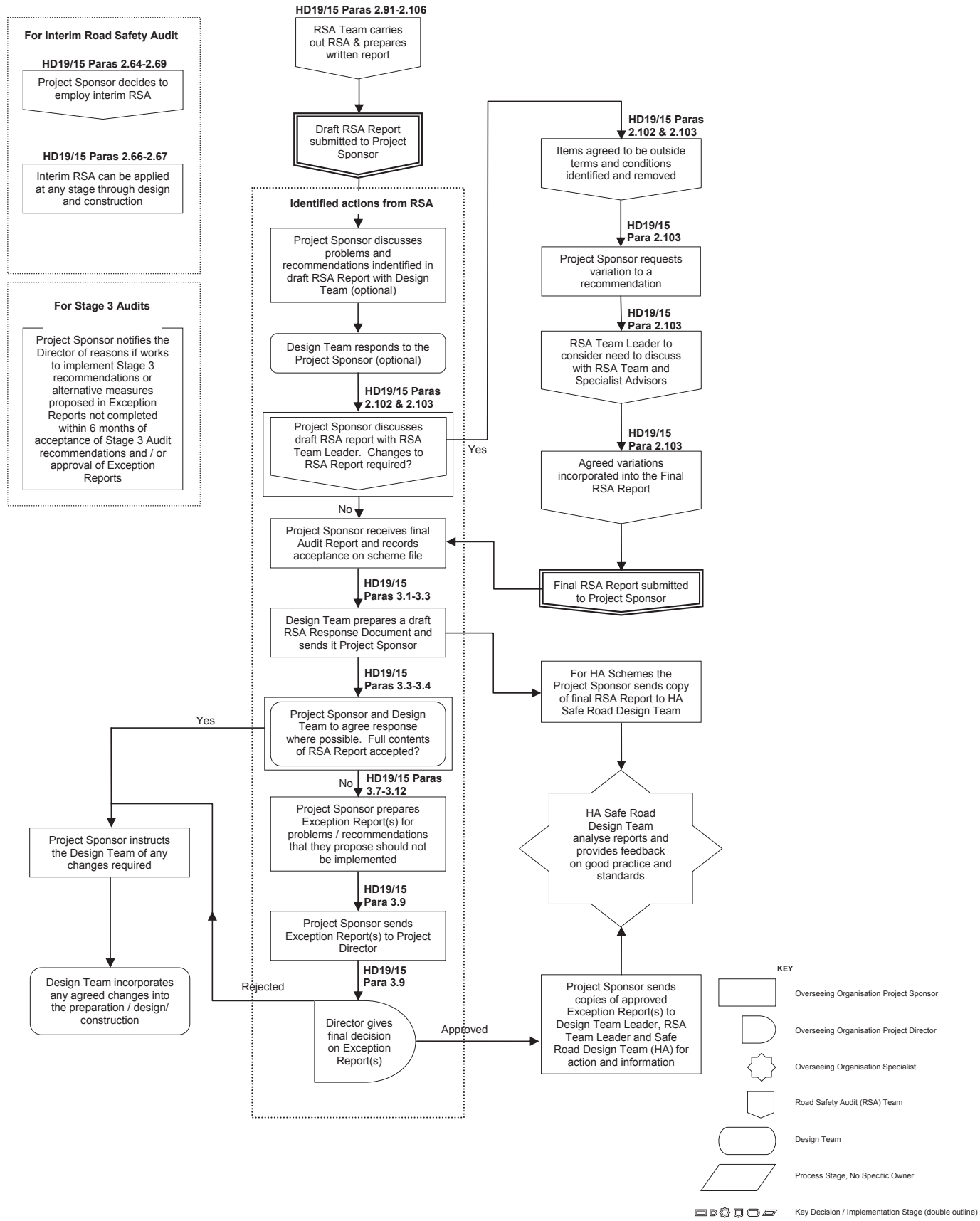
STAGES OF ROAD SAFETY AUDIT



ROAD SAFETY AUDIT PROCESS (1)



ROAD SAFETY AUDIT PROCESS (2)



ANNEX J: ROAD SAFETY AUDITOR CERTIFICATE OF COMPETENCY REQUIREMENTS

Introduction

J1. This Annex provides guidance and requirements for organisations wishing to offer a Road Safety Auditor Certificate of Competency and how practicing Road Safety Auditors may attain Certificate of Competency in Road Safety Audit.

J2. The information in this Annex supplements the advice and requirements contained in Section 2 of the main body of HD 19/15 and must be read in conjunction with the Standard.

Extent of Road Network where the Certificate of Competency is required

J3. The content of this Annex applies to all Road Safety Audits undertaken on the motorway and trunk road network in England, Northern Ireland, Scotland and Wales. It is also commended for use on the other areas of the Trans European Road Network (TERN) in the UK.

Who will require the Certificate of Competency?

J4. At least one Member of the Road Safety Audit Team (either the Road Safety Audit Team Leader or an Audit Team Member) undertaking Road Safety Audit on the motorway and trunk road network, must hold a Certificate of Competency in accordance with this Standard.

J5. The Certificate of Competency requirements must be applied to all stages of Road Safety Audit, including Interim Road Safety Audit and Stage 4 monitoring Road Safety Audits. Consequently, it is required that Road Safety Audit Teams at Stage 1, Stage 2, Combined Stage 1 & 2, Stage 3, Stage 4 and Interim Road Safety Audit, all include at least one Road Safety Audit Team Member that holds a Certificate of Competency.

Road Safety Auditor Certificate of Competency Requirements

J6. The Certificate of Competency requirements are consistent with the Road Safety Audit Team Training, Skills and Experience guidance contained in paragraphs 2.76 to 2.83 of this Standard. A Certificate of Competency in Road Safety Audit can only be awarded after a Road Safety Auditor has demonstrated sufficient training and experience in the field of Road Safety Audit.

J7. There are two routes through which a Road Safety Auditor may obtain a Certificate of Competency: A Portfolio of Evidence route or a Training Course route. It is envisaged that either route may count towards the two days annual Continuing Professional Development (CPD) recommended in paragraph 2.83 of this Standard. The routes are described below:

Portfolio of Evidence Route

J8. A Certificate of Competency in Road Safety Audit may be obtained by a candidate demonstrating that their existing training, skills and experience meet with paragraphs 2.76 to 2.83 of this Standard for a Road Safety Audit Team Member or Audit Team Leader.

J9. A candidate must also demonstrate an appropriate knowledge and understanding of the core modules set out in the outline training curriculum (see paragraph J29 of this Annex to HD 19/15).

J10. Appropriate knowledge and understanding of the core modules set out in the outline training curriculum may be demonstrated by a candidate submitting a Portfolio of Evidence to an appropriate professional organisation or company.

J11. In summary, the Portfolio of Evidence must include:

a) Details of how the candidate meets the Road Safety Audit Team training, skills and experience guidance contained in paragraphs 2.76 to 2.83 of this Standard, including:

- All training undertaken, including dates and locations of courses attended.
- Details of their Collision Investigation and Road Safety Engineering experience, focusing on work undertaken on the Strategic Road Network or comparable roads.
- Details of CPD undertaken in the last 12 months, to meet the guidance identified in paragraph 2.83 of this Standard.
- Details of all Road Safety Audits undertaken in the last 24 months as Road Safety Audit Team Member, Audit Team Leader, or Observer, including date of the Road Safety Audit, role of the candidate and scheme details. This information must focus on Road Safety Audits undertaken on the Strategic Road Network or comparable roads.

b) Example Road Safety Audit Reports with details of the candidate's contribution to the Road Safety Audit process and production of the Road Safety Audit Reports.

c) A Witness Statement from an appropriate person vouching for the content of the candidate's portfolio submission. This witness must hold a recognised qualification in the field of Road Safety, Civil Engineering or Transportation Planning or hold a senior professional position within a relevant company or organisation.

d) The Portfolio of Evidence must demonstrate that the candidate has an acceptable level of understanding of the core modules identified in the outline training curriculum in paragraph J29 of this Annex to HD 19/15.

J12. The Portfolio of Evidence, signed by the candidate, must be submitted to an independent professional organisation or company who have had their certification process accepted by the Highways Agency on behalf of all the Overseeing Organisations as outlined in paragraphs J20 and J21 of this Annex to HD 19/15. This professional organisation or company will be responsible for reviewing candidate's submissions and where appropriate, issuing the Certificate of Competency in Road Safety Audit.

Training Course Route

J13. A Certificate of Competency may also be obtained by a candidate undertaking an appropriate structured training course.

J14. The training course must conform to the following requirements:

a) It must be provided by an organisation or company independent from the candidate's employer.

b) It must cover the core modules set out in the outline training curriculum in paragraph J29 of this Annex to HD 19/15.

c) It must have had Highways Agency approval as detailed in paragraph J20 of this Annex to HD 19/15.

J15. Prior to completion of the training course and issue of a Certificate of Competency, the candidate must submit the following to the training provider:

d) Evidence signed by the candidate, of how they meet the guidance in paragraphs 2.76 to 2.83 of this Standard in terms of training, skills and experience for a Road Safety Audit Team Member or Audit Team Leader. This information must focus on work undertaken on the Strategic Road Network or comparable roads.

e) Example Road Safety Audit Reports with details of the candidate's contribution to the Road Safety Audit process and production of the Road Safety Audit Reports.

f) A Witness Statement, from an appropriate person which vouches for the content of the above submissions. This witness must hold a recognised qualification in the field of Road Safety, Civil Engineering or Transportation Planning or hold a senior professional position within a relevant company or organisation.

J16. The independent course provider must verify that candidates meet the training, skills and experience guidance in paragraphs 2.76 to 2.83 of this Standard for a Road Safety Audit Team Member or Audit Team Leader prior to issue of a Certificate of Competency in Road Safety Audit.

J17. The course provider must also assess candidates regarding their understanding of the content of the training course.

J18. Where a candidate has demonstrated to the training provider that they meet the training, skills and experience guidance in paragraphs 2.76 to 2.83 of this Standard for a Road Safety Audit Team Member or Audit Team Leader and has understood the content of the training course, the training provider will be responsible for issuing the Certificate of Competency in Road Safety Audit.

Certificate of Competency Validity Period

J19. The Certificate of Competency will not have a finite validity period, nor is it intended that holding a Certificate of Competency will require a mandatory membership of an organisation. However, Road Safety Auditors should demonstrate CPD and continued Road Safety Audit experience in accordance with paragraphs 2.83 of this Standard, subsequent to the award of the Certificate of Competency.

Assessment/Authorisation of Certificate of Competency

J20. Organisations wishing to offer a Certificate of Competency, to meet the requirements of this Standard, must have had their assessment and certification process reviewed and accepted in writing, by an appropriate member of the Highways Agency Safer Roads - Design Team. The Highways Agency is responsible for reviewing organisations wishing to offer a Certificate of Competency for the trunk road and motorway network in England and on behalf of the other Overseeing Organisations. Once accepted, the awarding organisation must not significantly change the review process leading to the issue of the Certificate of Competency, unless they have agreement to the change in writing, from the Highways Agency.

J21. The Highways Agency and the other Overseeing Organisations have a duty to ensure that the quality and consistency of the detailed training curriculum, assessment and certification process, is appropriate. Therefore the representatives from the Highways Agency and other Overseeing Organisations may wish to review a selection of Portfolio of Evidence submissions where a Certificate of Competency has been awarded or are about to be awarded. Alternatively, a member of the Highways Agency or one of the other Overseeing Organisations may periodically attend a training provider's course, as an observer, to review the Training Course Route process.

Certificates of Competency awarded before the entry into force of the EC Directive 2008/96/EC or Certificates awarded in other European Union Countries outside the UK

J22. The EC Directive 2008/96/EC states that certificates awarded before the implementation of the Directive shall be recognised. In addition, Certificates of Competency in Road Safety Audit awarded in other European Union countries outside the UK may be acceptable.

J23. Where a Road Safety Auditor holds a Certificate of Competency awarded before a process was agreed by the Highways Agency or other Overseeing Organisations, then details of the training curriculum and assessment process met for the prior award of the Certificate of Competency, must be provided to the Overseeing Organisation Specialist for consideration. If a Road Safety Auditor holds a Certificate of Competency awarded in another European Union country outside the UK, they must provide details of the training curriculum and the assessment process met.

J24. Before submitting the details of their previously awarded Certificate of Competency in Road Safety Audit to the Highways Agency, Road Safety Auditors must be satisfied that the training curriculum which led to the award of the Certificate of Competency covers all the core modules identified in the outline training curriculum in paragraph J29 of this Annex to HD 19/15. A Certificate of Competency awarded, based on a training curriculum that varies significantly from the outline training curriculum identified in paragraph J29 of this Annex to HD 19/15, will not be accepted by the Highways Agency.

J25. In addition, Road Safety Auditors must provide evidence to demonstrate that they meet the guidance and requirements in paragraphs 2.76 to 2.83 of this Standard in terms of relevant training, skills and experience for a Road Safety Audit Team Member or Road Safety Audit Team Leader. The candidates training, skills and experience must be verified by a Witness Statement, from an appropriate person. This witness must hold a recognised qualification in the field of Road Safety, Civil Engineering or Transportation Planning or hold a senior professional position within a relevant company or organisation.

Training Curriculum

J26. As detailed in paragraphs J9 to J18, a Certificate of Competency in Road Safety Audit may be awarded either by the Portfolio of Evidence Route or alternatively through the Training Course Route. The Training Course Route, through its content, and the Portfolio of Evidence Route through the assessment of the candidate's experience, must cover the core modules in the training curriculum in Figure J1.

J27. The training curriculum is only intended to be an outline requirement and it is the responsibility of those who provide a Certificate of Competency in Road Safety Audit, to submit their detailed course curriculum or application assessment process to the Highways Agency Specialist for acceptance.

J28. It is envisaged that a training course to cover the core modules in the training curriculum in Figure J1, will be of the order of two days duration.

J29. The outline training curriculum in Figure J1 is intended to complement the guidance within Chapter 2 of this Standard, which indicates that appropriate candidates for Road Safety Audit Teams are individuals whose current employment involves Collision Investigation and Road Safety Engineering. However, there will be some flexibility when the Highways Agency reviews an organisation's detailed training curriculum or application assessment process, as it is recognised that experienced Road Safety professionals may have developed their careers from different backgrounds. It is expected that the organisation's detailed training curriculum would cover recent developments and areas for improvement, relating to the core modules in Figure J1. Organisations detailed training curriculum and assessment processes should be set at an appropriate level for both Road Safety Audit Team Members, as well as Road Safety Audit Team Leaders.

Figure J1 – Outline Training Curriculum

Core Module		Example Module Content
1	Road Safety Legal Issues, Legislation and Policy	Review of the reasons why Road Safety Audit is undertaken, in terms of the 1980 Highways Act, 1988 Road Traffic Act and Roads (Scotland) Act 1984 where appropriate Introduction to the 2007 Road Death Investigation Manual The Corporate Manslaughter and Corporate Homicide Act 2007 The Manslaughter by Gross Negligence Common Law The EC Directive 2008/96/EC Road Safety Policies, targets and strategies

2	Collision Investigation	Understanding and applying collision investigation techniques Update on any developments in collision trends (The contents of this module must focus on the Strategic Road Network or comparable roads)
3	Road Safety Audit	This module should focus on areas for improvement and clarification of known potential issues. It should cover: Roles and Responsibilities Road Safety Audit administration and practice Road Safety Audit reporting (The contents of this module must focus on the Strategic Road Network or comparable roads)
4	Road Safety Engineering/Road Design	This module should cover the developments in Road Safety engineering and its influence on road design, with focus on the motorway and trunk road network. The EC Directive specifically requires training or experience in road design. Road Safety Auditors should have an understanding of the Highways Agency Design Manual for Roads and Bridges (DMRB) Design Standards, and how good design principles reduce collision risk. The module could include the following: Road/Junction Geometry and Design • Design Speed • Horizontal and vertical alignment, including cross sections, drainage, Stopping Sight Distances and adverse camber • Appropriateness of junction type • Visibility • Road surfaces, including the use of high friction surfacing Roadside Features • Passive infrastructure • Road Restraint Systems and guard railing • Landscaping • Highway lighting Facilities for vulnerable road users • Pedestrian/cycling/equestrian facilities • Mobility and visually impaired

ANNEX K:
ILLUSTRATIVE ROAD SAFETY AUDIT RESPONSE REPORT
A795 AMBRIDGE BYPASS ROAD SAFETY AUDIT STAGE 2

February 2016

PREPARED BY:
DLS Partnership (Highways Division)
12-14 Cathedral Close
Borchester
B01 6LZ

On behalf of:
The Highway Authority
1 Bentall Street
Borchester
BO1 8KZ

AUTHORISATION SHEET

Project: A795 Ambridge Bypass

Report Title: Stage 2 Road Safety Audit Response Report

PREPARED BY:

Name: Laurie Driver

Position: Design Team Leader

Signed: Laurie Driver

Organisation: DLS Partnership

Date: 10th February 2016

APPROVED BY:

Name: Elaine Gain

Position: Project Sponsor

Signed: Elaine Gain

Organisation: The Highway Authority

Date: 10th February 2016

Route Number: A795

Road Name: Ambridge Bypass

Scheme: A795 Ambridge Bypass Road Safety Audit:

Road Safety Audit: Stage 2

1. INTRODUCTION

1.1. This Road Safety Audit Response Report relates to the Stage 2 Road Safety Audit Report for the A795 Ambridge Bypass Scheme. The Stage 2 Road Safety Audit Brief comprised of a set of drawings assembled by the Design Team for the scheme and sent by the Overseeing Organisation Project Sponsor (Elaine Gain) to the Road Safety Audit Team for examination. The Road Safety Audit Report was prepared and issued by the Road Safety Audit Team Leader, M Juan of Ewing and Barnes Partnership (Traffic and Collision Investigation Division).

1.2. The proposed scheme incorporates the provision of 2.3km of 7.3m wide single carriageway between Station Road (to the south of the A827) and Ambridge Road to the north-east of Ambridge village. The scheme includes the provision of 5 priority junctions and a roundabout at the A827 dual carriageway junction. The improvement also encompasses the provision of two lay-bys, the diversion of a footpath and the stopping-up of Old Church Lane.

1.3. The Design Team have carefully considered the problems and recommendations in the Stage 2 Road Safety Audit Report. This Road Safety Audit Response Report includes all of the problems and recommendations raised by the Road Safety Audit Team, as well as the Design Team's response to these issues.

2. KEY PERSONNEL

2.1. **Overseeing Organisation**
Project Director – Anne Teeskid (The Highway Authority, Divisional Director)
Project Sponsor – Elaine Gain (The Highway Authority, Project Sponsor)

2.2. **Road Safety Audit Team**
Road Safety Audit Team Leader – M Juan (Ewing and Barnes Partnership: Traffic and Collision Investigation Division)
Road Safety Audit Team Member – Hugh Turner (Ewing and Barnes Partnership: Traffic and Collision Investigation Division)
Road Audit Team Member – A Rhodes (Road Safety Engineering Consultant)

2.3. **Design Organisation**
Design Team Leader – Laurie Driver (DLS Partnership: Highways Division)

3. ITEMS RAISED AT THE STAGE 2 ROAD SAFETY AUDIT

3.1. GENERAL

3.2. PROBLEM

Locations: A and N (drawing AMB956789A-1200-02 Rev C) – Adjacent to the Ambridge railway station.

Summary: Risk of a collision between a pedestrian and a vehicle due to potential shortcut to Bus Stop.

A cross-section Departure from Standard (in that there is no room for provision of a footway) on the existing railway bridge at location A has been reported. The departure has been introduced since the Stage 1 Road Safety Audit. Although pedestrians have been re-routed to cross the railway using the renovated station footbridge they may still be tempted to use the road bridge as this will provide a much shorter route to the adjacent Bus Stop (location N). Pedestrians using the road bridge would have to walk on the carriageway and therefore there would be an increased risk of a collision between a vehicle and a pedestrian.

RECOMMENDATION

It is recommended that the Bus Stop currently on the bypass is relocated to Station Road. In addition, it is recommended that pedestrian deterrent paving is provided on the verges on the immediate approaches to the bridge (both sides).

DESIGN TEAM RESPONSE

Disagree – It is considered inappropriate by the Design Team to relocate the Bus Stop from the proposed location. Station Road would be an inappropriate road to use for bus routes due to the narrow carriageway width and buses would have to travel along other inappropriate roads to reach their destinations if their routes were diverted along Station Road.

In addition, pedestrians would only have to walk a slightly longer distance to the proposed Bus Stop by using the footbridge, rather than the road bridge. Sufficient directional signing for pedestrians between the Railway Station and the Bus Stop, as well as the provision of pedestrian deterrent paving (as recommended), is considered sufficient by the Design Team in order to encourage pedestrians to use the footbridge, rather than walking on the carriageway across the road bridge.

3.3. PROBLEM

Locations: B and C (drawing AMB956789A-1200-02 Rev C) – Northern verge of Home Farm Road.

Summary: Open ditch is a potential hazard to an errant road user and could increase the severity of a collision.

An open ditch is proposed to run along the side of Home Farm Road on the outside of the bend. This ditch is the main outfall for the storm water drainage from much of the bypass and in places is more than 1.5m deep. It is likely to carry substantial quantities of water following heavy rainfall and represents a danger to errant motorists and cyclists. This problem could increase the severity of a collision involving a vehicle or cyclist leaving the carriageway in this location.

RECOMMENDATION

It is recommended that an appropriate safety fence is provided at the back of the grass verge between location B and location C.

DESIGN TEAM RESPONSE

Agreed – A safety fence will be provided in this location.

3.4. PROBLEM

Locations: D and E (drawing AMB956789A-1200-02 Rev C) – Lay-bys north of Old Church Lane.

Summary: Lay-by positions provide an increased risk of shunt and right turn collisions as road users may attempt to access them from the opposite traffic lane.

Drivers travelling north will reach the lay-by at location D on their right, before the lay-by at location E on their left. Similarly, vehicles travelling south will reach the lay-by at E on their right first. Since the lay-bys are not inter-visible and there are no advance signs, drivers could be tempted to cross the carriageway to use the first lay-by that they reach. This problem would increase the number of right turning manoeuvres and therefore increase the potential for collisions between right turning vehicles and vehicles travelling ahead in the opposite direction. It could also increase the likelihood of shunt collisions involving vehicles running into the back of other vehicles waiting to turn right into the lay-by.

RECOMMENDATION

It is recommended that the lay-bys are repositioned so that drivers encounter a lay-by on their nearside first. When relocating the lay-bys ensure that adequate visibility is provided for a driver both entering and leaving the facility. In addition, provide advance signing of both facilities.

DESIGN TEAM RESPONSE

Agreed – The proposed southbound lay-by on this link will be relocated to a position further north (in the vicinity of Location E as shown on the Problem Location Plan) and the proposed northbound lay-by will be relocated to a position further south (in the vicinity of Location D as shown on the Problem Location Plan). These lay-bys will be positioned so that they are not located on the inside of a left hand curve with a radius less than 1,440m for a 100 kph Design Speed (as recommended in TD 69).

3.5. PROBLEM

Location: F (drawing AMB956789A-1200-02 Rev C) – Junction between Old Church Lane and the bypass.

Summary: Downhill gradient and limited visibility on side road approach increases the risk of overshoot type collisions.

The realigned section of Old Church Lane where it meets the bypass has a downhill longitudinal gradient of 7% and limited forward visibility. There is danger of traffic failing to stop at the give way line and skidding into the bypass in bad weather conditions. This feature could result in vehicles on Old Church Lane overrunning the give way line and colliding with through traffic on the bypass.

RECOMMENDATION

It is recommended that the realigned section of Old Church Lane is provided with high friction surfacing and additional signs to warn traffic of the give way junction ahead.

DESIGN TEAM RESPONSE

Agreed – A 50m length of high friction surfacing will be installed on the immediate approach to the give way line on Old Church Lane. A ‘give way ahead’ advance warning traffic sign, in line with diagram number 501 of the document *Traffic Signs Regulations and General Directions* (TSRGD), will also be provided on this approach (supplemented with a “Give Way 50 yds” sign plate).

3.6. PROBLEM

Location: G (drawing AMB956789A-1200-02 Rev C) – On the bypass midway between Old Church Lane and Home Farm Road adjacent to the northbound lane.

Summary: Unprotected embankment could increase the severity of a collision involving an errant vehicle in this location.

The safety fence on the west side of the bypass between chainage 1+550 and 1+650 leaves some embankment unprotected. This could increase the severity of a collision involving a vehicle or cyclist leaving the carriageway.

RECOMMENDATION

It is recommended that the safety fence is extended back to chainage 1+500.

DESIGN TEAM RESPONSE

Agreed – This safety fence will be extended to chainage 1+500.

3.7. PROBLEM

Locations: H to I (drawing AMB956789A-1200-02 Rev C) – On the bypass adjacent to the Westlee Dairy.

Summary: Headlights of vehicles on the parallel Westlee Dairy access road could distract and disorientate drivers on the bypass, potentially resulting in drivers losing control of their vehicles.

The access road to the Westlee Dairy Depot runs parallel to the bypass for about 250m. The Road Safety Audit Team understands that there is considerable vehicular activity on this road at night. The headlights of traffic using this road could be very confusing when viewed from the bypass. This could distract and disorientate drivers on the bypass to the extent they lose control of their vehicles.

RECOMMENDATION

It is recommended that an earth bund, solid fence or similar screen is provided adjacent to the Westlee Dairy boundary.

DESIGN TEAM RESPONSE

Agreed – An appropriate screen will be provided between the bypass and the Westlee Dairy access road in this location.

3.8. PROBLEM

Location: Q (drawing AMB956789A-1200-02 Rev C) – Entrance to the electricity sub-station north of Home Farm Road.

Summary: No provision for service vehicles to stop off the bypass when accessing the sub-station. This could result in parked service vehicles being struck by other road users.

The entrance gates to the electricity sub-station at chainage 1+900 (location Q) are located such that drivers wishing to enter the compound would have to park on the bypass whilst they unlock the gate. This could result in a vehicle travelling on the bypass colliding with the parked vehicle. It could also encourage vehicles to overtake parked vehicles increasing the risk of head-on collisions.

RECOMMENDATION

It is recommended that the gates are relocated further back from the edge of the carriageway. If, however, the location of equipment in the compound precludes the relocation of the gates, it is recommended that a lay-by or hardstanding area is provided to allow vehicles to wait off the road while the gates are being opened or secured.

DESIGN TEAM RESPONSE

Agreed – The access gates for the compound will be set back further from the carriageway in order to allow a service vehicle to park up off the carriageway while an operative unlocks and opens the gates.

3.9. THE ALIGNMENT

3.10. PROBLEM

Location: J to L (drawing AMB956789A-1200-03 Rev B) – Crest to the north of Old Church Lane.

Summary: Proposed hazard road marking is not sufficient to discourage drivers from overtaking in this area, therefore this could increase the potential for overtaking collisions.

The entire length of the bypass between the Ambridge Road Junction (location J) and the Bull Roundabout (location L) is marked with hazard road markings (to Traffic Signs Regulations and General Directions diagram 1004.1) indicating the lack of full overtaking sight distance. It is considered that the meaning of this road marking is not well understood by the general public and there is no indication that the visibility reduces appreciably over the crest at chainage 1+250. This problem could increase the potential for collisions involving inappropriate overtaking.

RECOMMENDATION

It is recommended that 1m carriageway hatch road markings (to Traffic Signs Regulations and General Directions diagram 1013.1B) are provided over the crest. The use of this road marking should be coordinated with recommendation 3.13 below.

DESIGN TEAM RESPONSE

Agreed – 1m wide carriageway hatch road markings will be provided in the centre of the bypass between locations J and L (except for the locations described in the Design Team Response for Problem 3.13).

3.11. THE JUNCTIONS

3.12. PROBLEM

Location: L (drawing AMB956789A-1200-02 Rev C) – North from the Bull Roundabout.

Summary: Confusion over the layout of road north of the roundabout may result in inappropriate overtaking which could lead to head-on conflicts.

Road users originating from the existing dual carriageway A827 Borchester Road (which has a mature Quickthorn hedge in the central reserve) and turning onto the new bypass (northbound) may be confused into thinking that the new bypass is a dual carriageway, particularly as the old field hedge to

the west could be assumed to be in a central reserve and concealing a northbound carriageway. Traffic on the access road to the Westlee Dairy could further confuse road users in this location unless the recommendation at paragraph 3.7 above is implemented. This problem could increase the potential for collisions involving vehicles overtaking in an inappropriate location.

RECOMMENDATION

It is recommended that the splitter island and associated hatch markings shown on drawing AMB956789A-1200-02 Rev C are redesigned to emphasise that the bypass is a single carriageway. In addition, it is recommended that two-way traffic signs (to diagram number 521 of The Traffic Signs Regulations and General Directions) are provided on the northbound bypass immediately after the roundabout.

DESIGN TEAM RESPONSE

Agreed – An advance 'two way traffic' warning sign (to TSRGD diagram number 521) will be installed on the northbound bypass exit from the A827 roundabout. An appropriate roundabout splitter island with hatched road markings (to TSRGD diagram number 1040) will be provided on the northern bypass arm of the A827 roundabout.

3.13. PROBLEM

Location: J (drawing AMB956789A-1200-03 Rev B) – Northbound approach to Ambridge Road Junction.

Summary: The road layout on the approach to the junction does not discourage overtaking on this straight downhill section of the bypass, therefore this could increase the potential for collisions involving overtaking vehicles.

The approach to this junction along the proposed bypass from the south is via a straight downhill section of about 1km length and traffic speeds are likely to be high. The necessity of making sure that overtaking manoeuvres are completed in good time, before the central reserve at the junction commences, was flagged at the Stage 1 Road Safety Audit. The current design does not adequately address this issue. As a result there is a potential for overtaking collisions and side impact collisions as overtaking vehicles abruptly move back into the northbound lane before the junction.

RECOMMENDATION

(a) It is recommended that a continuous prohibitory double white line road marking to diagram 1013.1 is provided from the southern end of the central reserve (location M drawing AMB956789A-1200-03 Rev B) for a distance of about 340m uphill (FOSD/4 before the nosing), to replace the proposed hazard road marking. This will force drivers into a single lane well before the junction. Coordination with the recommendation in paragraph 3.10 above is recommended.

(b) It is recommended that the advanced direction sign ADS6 is repositioned approximately 150m from the junction to warn traffic travelling at higher speeds.

(c) It is recommended that "SLOW" carriageway road markings are provided on the approaches to the junction from both the north and south direction to moderate speeds through the junction.

(d) It is recommended that hatching is provided within the hard strip to further discourage drivers from attempting to overtake in the short single lane dual carriageway section through the junction.

DESIGN TEAM RESPONSE

Agreed – Double white line road markings will be provided on the bypass for a 340m length south of location M. An appropriate transition with the proposed 1m wide hatch road markings (see Problem 3.10) will be provided. The advance direction sign ADS6 will be relocated on the bypass to a position approximately 150m from the Ambridge Road junction.

"SLOW" road markings will be provided on all of the approaches to the Ambridge Road junction with the bypass and hatching road markings will be provided within the hard strip adjacent to the short section of single lane dualling at the junction.

3.14. NON-MOTORISED USERS (NMUs)

3.15. PROBLEM

Locations: O and P (See drawing AMB956789A-1200-02 Rev C) – Former line of the footpath at the crest to the north of Old Church Lane.

Summary: The former footpath alignment may still attract pedestrians to cross at a location with limited visibility. This could result in an increased potential for a collision between a vehicle and pedestrian.

The scheme allows for the diversion of Footpath No. 12 so that it crosses the bypass away from the crest curve at location K. The old route may, however, be more attractive to pedestrians. This could result in a collision between a vehicle and pedestrian due to the reduced visibility at the crest curve.

RECOMMENDATION

It is recommend that the landscaping is modified with heavy planting to block the old route at the edge of the bypass (location O) and remove the old stile at the field boundary (location P) and replace with solid wall to match existing.

DESIGN TEAM RESPONSE

Agreed – The recommendations of the Stage 2 Road Safety Audit Team, to modify the landscaping, remove the old stile and provide a solid wall will be implemented in order to discourage pedestrians from crossing the carriageway in this location.

3.16. PROBLEM

Location: Throughout the length of the bypass.

Summary: The proposed raised ribbed edge line road marking may be potentially hazardous to cyclists at junctions.

It is not uncommon for cyclists to use the marginal strip provided along busy bypasses to avoid being intimidated by other vehicles. The drawings indicate that road markings to Diagram 1012.3, raised ribbed road markings, will be used as edge line road markings. These road markings may cause difficulties for cyclists entering or leaving the marginal strip near junctions and result in cyclists losing control of their bicycle.

RECOMMENDATION

It is recommended that road markings to Diagram 1012.3 are replaced by those to Diagram 1012.1 for a length of 20m on the approach and exit sides of any junction.

DESIGN TEAM RESPONSE

Agreed – Road markings to TSRGD diagram number 1012.1 will be provided for 20m on the approach and exit sides of the various junctions.

3.17. SIGNING AND LIGHTING

3.18. PROBLEM

Location: L (drawing AMB956789A-1200-02 Rev C) – westbound approach to the Bull Roundabout.

Summary: The proposed positioning of a lighting column could increase the risk of errant vehicle colliding with the lighting column located in front of the safety fence.

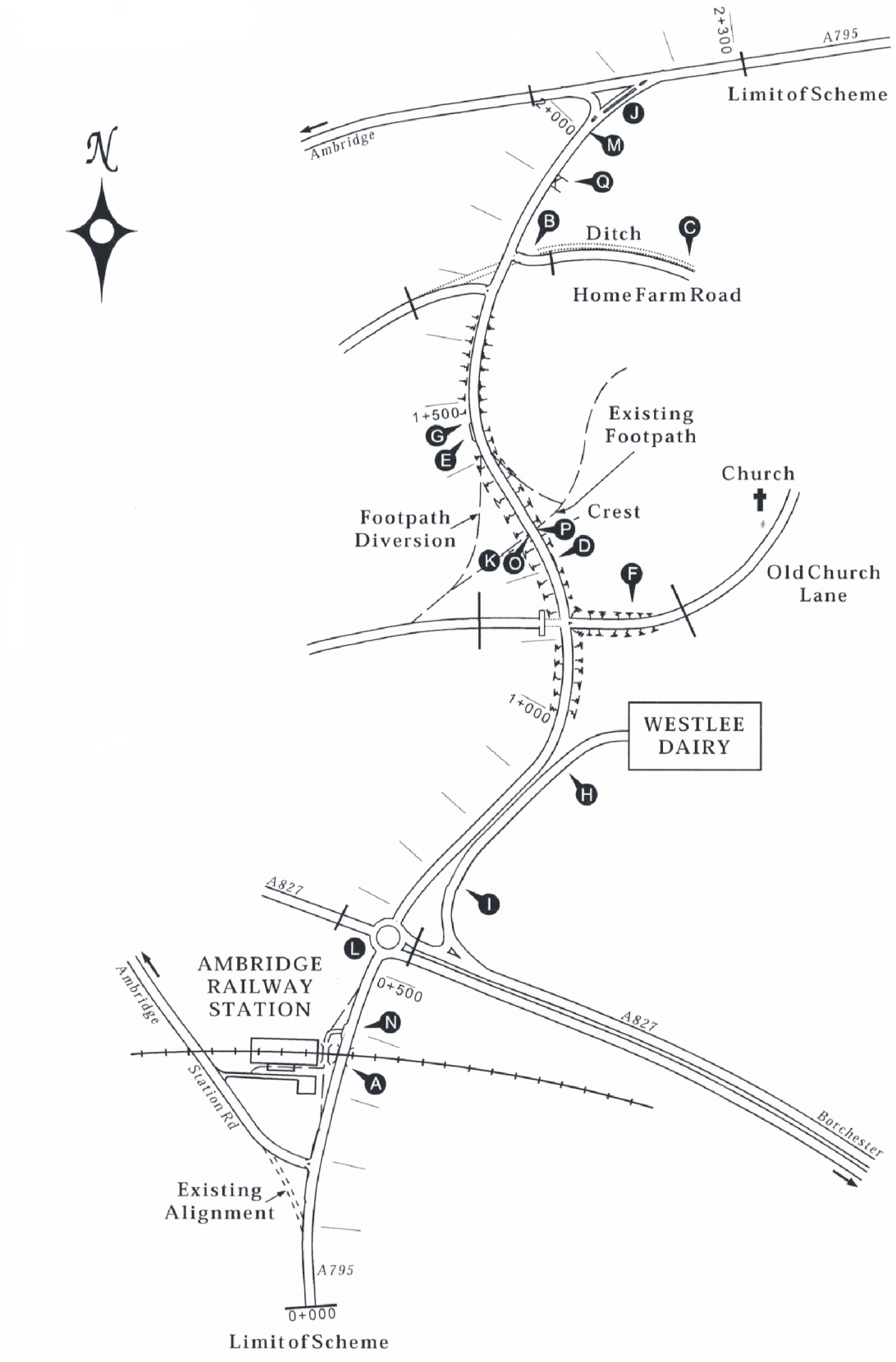
On the A827 Borchester Road dual carriageway approach to the Bull Roundabout a length of safety fence is proposed to protect a large advance direction sign in the nearside verge. The drawings provided show a lighting column approximately 60 metres from the roundabout, located in front of the proposed safety fence. An errant vehicle leaving the carriageway in this location could run along the length of the safety fence into the lighting column, therefore this could significantly increase the severity of a collision occurring in this location.

RECOMMENDATION

It is recommended that the proposed lighting column is relocated behind the length of safety fence.
DESIGN TEAM RESPONSE

Agreed – This lighting column approximately 60m from Bull Roundabout will be moved to a location behind the safety fence (beyond the working width of the barrier).

AMBRIDGE BYPASS



ANNEX L:
ILLUSTRATIVE EXCEPTION REPORT
A795 AMBRIDGE BYPASS
ROAD SAFETY AUDIT STAGE 2

February 2016

PREPARED BY:
The Highway Authority
1 Bentall Street
Borchester
BO1 8KZ

AUTHORISATION SHEET

Project:	A795 Ambridge Bypass
Report Title:	Stage 2 Road Safety Audit Exception Report

PREPARED BY:

Name:	Elaine Gain
Position:	Project Sponsor
Signed:	Elaine Gain
Organisation:	The Highway Authority
Date:	20th February 2016

APPROVED BY:

Name:	Anne Teeskid
Position:	Project Director
Signed:	Anne Teeskid
Organisation:	The Highway Authority
Date:	20th February 2016

Route Number: A795
Road Name: Ambridge Bypass
Scheme: A795 Ambridge Bypass
Road Safety Audit: Stage 2

1. INTRODUCTION

1.1. This Exception Report is in response to the Stage 2 Road Safety Audit Report for the A795 Ambridge Bypass Scheme. The Stage 2 Road Safety Audit Brief comprised of a set of drawings assembled by the Design Team for the scheme and sent by me (the Overseeing Organisation Project Sponsor) to the Road Safety Audit Team for examination. The Road Safety Audit Report was prepared and issued by the Road Safety Audit Team Leader, M Juan of Ewing and Barnes Partnership (Traffic and Collision Investigation Division).

1.2. The proposed scheme incorporates the provision of 2.3km of 7.3m wide single carriageway between Station Road to the south of the A827 and Ambridge Road to the north-east of Ambridge village. The scheme includes the provision of 5 priority junctions and a roundabout at the A827 dual carriageway junction. The improvement also encompasses the provision of two lay-bys, the diversion of a footpath and the stopping-up of Old Church Lane.

1.3. As Project Sponsor I have carefully considered the problems and recommendations in the Stage 2 Road Safety Audit Report and the Design Team's Road Safety Audit Response Report for each problem. As a result, I propose that the Recommendation to Problem 3.2 should not be implemented.

1.4. To determine the potential risks of not implementing this Recommendation, I have carried out a Risk Assessment in accordance with the principles contained in the DMRB Standard GD 04/12. This Risk Assessment is attached to this Exception Report.

1.5. Therefore, I have produced this Exception Report for consideration by the Project Director with the request that they sign the Exception Report and indicate their acceptance or rejection. If accepted and signed by the Director, the Exception Report will be copied and attached to every copy of the Stage 2 Road Safety Audit Report.

2. KEY PERSONNEL

2.1. Overseeing Organisation

Project Director – Anne Teeskid (The Highway Authority, Divisional Director)

Project Sponsor – Elaine Gain (The Highway Authority, Project Sponsor)

2.2. Road Safety Audit Team

Road Safety Audit Team Leader – M Juan (Ewing and Barnes Partnership: Traffic and Collision Investigation Division)

Road Safety Audit Team Member – Hugh Turner (Ewing and Barnes Partnership: Traffic and Collision Investigation Division)

Road Audit Team Member – A Rhodes (Road Safety Engineering Consultant)

2.3. Design Organisation

Design Team Leader – Laurie Driver (DLS Partnership: Highways Division)

3. EXCEPTION REPORT ON PROBLEM 3.2 OF THE STAGE 2 ROAD SAFETY AUDIT

3.1. ROAD SAFETY AUDIT REPORT SECTION: GENERAL

3.2. PROBLEM

Locations: A and N (drawing AMB936789A-1200-02 Rev C) – Adjacent to the Ambridge railway station.

Summary: Risk of collision between a pedestrian and a vehicle due to potential shortcut to Bus Stop.

A cross-section departure (in that there is no room for provision of a footway) on the existing railway bridge at location A has been reported. The departure has been introduced since the Stage 1 Audit. Although pedestrians have been re-routed to cross the railway using the renovated station footbridge they may still be tempted to use the road bridge as this will provide a much shorter route to the adjacent Bus Stop (location N). Pedestrians using the road bridge would have to walk on the carriageway and therefore there would be an increased risk of collision between a vehicle and a pedestrian.

RECOMMENDATION

It is recommended that the Bus Stop currently on the bypass is relocated to Station Road. In addition provide pedestrian deterrent paving on the verges on the immediate approaches to the bridge (both sides).

DESIGN TEAM RESPONSE – ROAD SAFETY AUDIT RESPONSE REPORT

It is considered inappropriate by the Design Team to relocate the Bus Stop from the proposed location. Station Road would be an inappropriate road to use for bus routes due to the narrow carriageway width, and buses would have to travel along other roads which have significant on-street parking and vertical traffic calming measures to reach their destinations if their routes were diverted along Station Road.

In addition, pedestrians would only have to walk a slightly longer distance to the proposed Bus Stop by using the footbridge rather than the road bridge. Directional signing for pedestrians between the Railway Station and the Bus Stop and pedestrian deterrent paving will be provided (as recommended in the Stage 2 Road Safety Audit), this is considered sufficient by the Design Team in order to encourage pedestrians to use the footbridge rather than walking on the carriageway across the road bridge.

The use of pedestrian guard rail has been considered as an alternative to pedestrian deterrent paving but this has been discounted as it could be considered a potential hazard to errant road users and pedestrians who do chose to use the road bridge may find themselves trapped on the wrong side of the guard railing.

PROJECT SPONSOR'S STATEMENT

I agree with the Design Team and consider the Road Safety Audit Recommendation to be inappropriate in terms of relocating the proposed location of the Bus Stop. The Design Team's proposal to encourage pedestrians to use the footbridge by providing directional signing and the Road Safety Audit Teams recommendation for pedestrian deterrent paving on the verges on both sides of the road bridge, should mitigate the risk identified by the Road Safety Audit Team to a level that is considered to be as low as reasonably practicable.

I propose that the Recommendation to relocate the bus stop suggested in Problem 3.2 in the Stage 2 Road Safety Audit is not implemented and that the Design Team's alternative proposals are implemented instead.

This Exception Report is presented to the Project Director for the final decision by:

Elaine Gain (Project Sponsor)

Signature: Elaine Gain

Date: 20th February 2016

PROJECT DIRECTOR'S COMMENTS AND FINAL DECISION

This Exception Report is/is not accepted by (delete as required):

Anne Teeskid
Project Director

Signature.....

Date.....