

LOCAL ROAD SAFETY AUDIT PROCEDURES

THE SHEFFIELD PROCEDURE FOR DOCUMENTING RESPONSES AND COMMENTS IN ROAD SAFETY AUDIT REPORTS

NOTE

TO THE INSTITUTE OF HIGHWAY ENGINEERS

**DEVELOPMENT SERVICES
TRANSPORT AND HIGHWAYS - ROAD SAFETY**
Safety Audit Ref: TE/16-500
Date: 6 APRIL 2010

L Sturch MRTPI
Director of Development Services
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Sheffield *where everyone matters*



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LOCAL ROAD SAFETY AUDIT PROCEDURES

THE SHEFFIELD PROCEDURE FOR DOCUMENTING RESPONSES AND COMMENTS IN ROAD SAFETY AUDIT REPORTS

NOTE TO THE CHARTERED INSTITUTION OF TRANSPORT AND HIGHWAYS AND THE SOCIETY OF ROAD SAFETY AUDITORS

1.0 Introduction

- 1.1 This Note is to illustrate the Sheffield Procedure for documenting Road Safety Audit Responses and Comments in Audit Reports. The Procedure has been developed in Sheffield and tried and tested on one of the largest Road Safety Audits ever undertaken by the Road Safety Team of the City Council's Transport and Highways Division.

2.0 Purpose

- 2.1 The purpose of this simple method of documentation is to minimise the Audit paper trail and have one comprehensive document at the Final Audit Report Stage, that is easy to understand and quicker to reference by the Audit Teams, Client or Design Teams and any other parties involved. It will have particular benefits for Auditors working to their own Authority's Local Road Safety Audit Procedures and dealing directly with the Design Teams but could also be commended as a recognised Procedure to the Highways Agency as part of the National Road Safety Audit Standard DMRB HD 19/03, where there is a requirement to send a draft report to the Project Sponsor and not via the Design Teams. It could also benefit Local Authorities with limited staff resources by enabling them to carry out more effective Road Safety Audits.

3.0 Background

- 3.1 Following the publication of the Highways Agency Road Safety Audit Standard HD 19/03 in 2003 and the subsequent adoption of the "Ambridge" style Road Safety Audit Report format illustrated at Annexe E of HD 19/03, the method of documenting Responses and Comments in Road Safety Audit Reports was reviewed in Sheffield to minimise the paper-trail of letters, memoranda and printed e-mails to make Reports simpler and more comprehensive, easier to understand and quicker to reference.
- 3.2 In July 2004, the Road Safety Team of Sheffield City Council's Transport and Highways Division commenced the Stage 2 Road Safety Audit of the Northern Section of the Sheffield Inner Relief Road. This was a £65M project comprising 1.4 kilometres of new dual carriageway, 17 signalised junctions, a new river crossing, a new railway bridge, facilities to assist pedestrians and cyclists and also public transport improvement measures.

- 3.3 The scale of the project and the envisaged design changes throughout the project, dictated that the documentation of all Audit issues, including Audit Responses from the Clients or Design Teams and the subsequent Road Safety Audit Team Comments, would be critical throughout the Stage 2 Audit.
- 3.4 The Final Stage 2 Audit Report would need to be a document that was easily navigable by the Design Teams and the Audit Team carrying out a Stage 3 Audit at a later date and also easy to understand by any third parties including the Police who could be involved in potential future investigations or litigation.

4.0 Method

- 4.1 The Design Teams involved in the project were asked by the Road Safety Audit Team Leader to send all Design Team Responses to problems raised in the Stage 2 Audit electronically, by inserting their Responses at the appropriate point in the report and then emailing a copy of the report back to the Road Safety Audit Team Leader. Any Audit Team Comments would then follow in the same format. Whilst this method of documentation had been used to some extent at the previous Stage 1 Audit undertaken in 2002, the Stage 1 Audit Report was not particularly lengthy and was in the previously adopted format, prior to the “Ambridge” style as illustrated in HD 19/03. Given that this would possibly be the largest Stage 2 Road Safety Audit ever undertaken on a single new highway project in Sheffield and it would also be the first time that the “Ambridge” style Audit Report had been used by the Audit Team, it was agreed by all parties involved that this Stage 2 Road Safety Audit would be an ideal opportunity to trial the new procedure for documenting Audit Responses and Comments in a report.
- 4.2 The Final Stage 2 Road Safety Audit Report for the Northern Section of the Sheffield Inner Relief Road, including the Design Team Responses and Feedback, Road Safety Audit Team Comments and an Appendix to the Report, resulted in a 400 page document. Given that this report would be much too large and complex to include with this Note, a simpler and shorter Stage 1 Road Safety Audit Report on a less complex scheme in Sheffield is included at Appendix A to illustrate the Sheffield Procedure for documenting Audit Responses and Comments.

5.0 Conclusion

- 5.1 Since first trialling the Sheffield Procedure in the format of the “Ambridge” style Road Safety Audit Report as illustrated in HD 19/03, this Procedure has been adopted for all Road Safety Audits. It has been recognised by the City Council’s in-house Design Teams as a major breakthrough in breaking down the barriers that previously existed between the Design Teams and the Road Safety Audit Teams and establishes a clear line of communication that generally leads to a better understanding between the teams involved and results in Audit issues generally being resolved more quickly.

- 5.2 In addition, the Sheffield Procedure results in Audit issues being easier to understand by any third parties including the Police who could be involved in potential future investigations or litigation.
- 5.3 Whilst the Sheffield Procedure is seen as being particularly relevant to Road Safety Auditors in Local Authorities who are following Chapter 8 of the CIHT Road Safety Audit Guidelines - *How to Develop a local Procedure and Policy* it could nevertheless be developed as Best Practice Nationally as part of the present Highways Agency National Road Safety Audit Standard DMRB HD 19/03 or any future revised National Road Safety Audit Standard.

6.0 Recommendations

- 6.1 That the Sheffield Procedure for documenting Audit Responses and Comments be considered by the Institute of Highway Engineers [IHE] as an acceptable and workable Procedure, and subject to their consideration and acceptance for this Procedure to be commended as Best Practice for Road Safety Auditors as a Local Procedure or otherwise and possibly included on the IHE website.
- 6.2 That subject to acceptance by IHE, for details of the Sheffield Procedure to be passed to the Highways Agency for possible inclusion in any future updated version of the current National Road Safety Audit Standard DMRB HD 19/03, as a further development of the "Ambridge" style Road Safety Audit Report that is now used by the majority of Road Safety Auditors in both local authorities and private practices..

7.0 Statement

I certify that this method of documenting Road Safety Audit Responses and Road Safety Audit Team Comments was developed in Sheffield in 2004 for use on a major highway project and has subsequently been adopted for all other Audits carried out by the Council's Road Safety Audit teams. To my knowledge, this method has not been used elsewhere in the country by other Road Safety Practitioners.

ROAD SAFETY AUDIT TEAM LEADER [author of this Note]

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Signed



Dated 1 April 2010

APPENDIX A

Illustrative Example Of Sheffield Procedure For Documentation Of Audit Responses And Comments

Final Stage 1 Road Safety Audit Report

[For illustration purposes only]

ROAD SAFETY AUDIT REPORT

SHEFFIELD BUS RAPID TRANSIT NORTH - JUNCTION IMPROVEMENTS

STAGE 1 ROAD SAFETY AUDIT [PRELIMINARY DESIGN]

FINAL REPORT

INCLUDING:

DESIGN TEAM RESPONSE [1] 13.11.09

RSA TEAM COMMENTS [1] 30.11.09

DESIGN TEAM RESPONSE [2] 20.01.09

RSA TEAM COMMENTS [2] 26.02.10

DESIGN TEAM RESPONSE [3] 11.03.10

RSA TEAM COMMENTS [3] 19.03.10

1.0 INTRODUCTION

- 1.1 This report results from a Stage 1 Road Safety Audit carried out on the preliminary design of the BRT North – Junction Improvements Scheme at the request of C Galloway, Transport and Highways, Traffic Management, Sheffield City Council, by memorandum dated 29 September 2009. This is the first formal Safety Audit of these proposals.

The Audit Team Membership approved by C Galloway for this Stage 1 Safety Audit was:

John Moseley	[Audit Team Leader for this Audit] Principal Road safety Engineer Transport and Highways Development Services Sheffield City Council
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Dean Barker	[Audit Team Member for this Audit] Consultant Road Safety Engineer
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- 1.2 The Audit was undertaken in accordance with the Sheffield City Council Road Safety Audit Standard 2005 and comprised an examination of the drawings and documents provided, as detailed at Appendix A, and a brief site visit.
- 1.3 The Audit Team has examined and reported only on the road safety implications for the scheme as presented, and has not examined or verified the compliance of the designs to any other standards or criteria.
- 1.4 Unless general to the scheme, all problems' and recommendations' locations have been referenced on the Problem Location Drawings TE/16-376/BN729/ST1/01 to 04 included at Appendix B.
- 1.5 The Stage 1 Road Safety Audit was completed on 10 November 2009.

2.0 SCHEME DESCRIPTION

- 2.1 These specific improvements form part of the BRT North Route, which runs between the two district centres through the Wicker, Attercliffe, Carbrook, Meadowhall and Templeborough. The proposed route also includes a new link road beneath the M1 Tinsley viaduct connecting Sheffield Road to Meadowhall Way, to help traffic and improve access to existing and new developments. NB. At existing signal controlled junctions and pedestrian/cycle facilities along the route, virtual bus priority will be implemented which will enable the BRT buses to pass seamlessly through them without delay.

3.0 NOTES FOR THE DESIGN TEAM - UNRESOLVED ISSUES

- 3.1 In accordance with the Arbitration Procedure [outlined in the Sheffield City Council Road Safety Audit Standard 2005], after the Design Team has given due consideration to the problems raised by the Audit Team [and meetings have taken place between the Design Team and the Audit Team] any changes made to the design shall be submitted to the Audit Team for that part of the scheme to be re-audited.
- 3.2 Items in the Audit report that are not acted upon, either because they are felt to be outside the terms of reference of the project or deemed not appropriate by the Design Team should be included in an Exception Report. The Exception Report should be prepared by the Design Team, on behalf of the Project Sponsor, giving the reasons for rejection together with any alternative solutions and sent to the Arbiter with a copy to the Audit Team.
- 3.2 The Arbiter is to be the Head of Transport and Highways or his nominees.

4.0 ITEMS RAISED IN THIS [STAGE 1] SAFETY AUDIT

ATTERCLIFFE COMMON / CLAY STREET JUNCTION

Problems apply to drawing TM-BN729-C4-1.1

4.1 PROBLEM

Location: 4.1 on Plan TE/16-376/BN729/ST1/01 at Appendix B – Attercliffe Common southwest bound commencement of bus-lane

Summary: Nearside splay / narrowing at start of bus-lane may lead to increased risk of lane-change related accidents as a result of preceding junction arrangement

The above bus-lane is proposed to be formed to the southwest of the existing Coleridge Road junction. On the southwest approach to this signal controlled junction, two lanes are formed for general traffic marked as *Ahead-only* and *Ahead & right*. This encourages two lanes of traffic to pass through the junction southwest bound, where ample carriageway width is currently available for the two lanes to merge into a one beyond the junction.

Under the proposed layout, the two lanes of traffic would be forced to merge into a single lane much more quickly, over the 60m or so that would be available to the southwest of the junction prior to the commencement of the bus-lane. Furthermore, on the opposing, northeast bound approach to the Coleridge Road junction traffic also forms two *Ahead* lanes, with vehicles moving towards the offside (and the opposing flow) in the vicinity of where southwest bound vehicles would be merging into a single lane.

The Audit Team is concerned that these factors could lead to an increased likelihood of collisions between the two southwest bound lanes as they are forced to merge into one, with an additional possibility of collisions between the opposing flows in this area. The layout of the centre line due to the slight bend in horizontal alignment here exacerbates the risk.

RECOMMENDATION

Relocate the commencement of the bus-lane to be on the southwest bound approach to the Coleridge Road junction.

Rather than forming two southwest bound *Ahead* lanes through the junction, form a nearside bus-lane on the junction approach at the point where the two lanes are presently formed. Force all general traffic into a single lane to the offside of the bus-lane, and provide a short break at the junction for left-turning vehicles entering Coleridge Road.

In order to resume the bus-lane immediately to the leaving side of the junction, reduce the northeast bound approach to Coleridge Road to be a single lane layout.

DESIGN TEAM RESPONSE [1]

The proposed bus lane mimics the arrangement that was in place a few years ago. As far as I'm aware this did not lead to any accidents of the type described. It would be useful to see the accident statistics during the time when the bus lane was in place, could you make these available for analysis during detailed design? Because of the limited distance between the pelican crossing north east of Coleridge Road and the need to terminate any bus lane before the Coleridge Rd junction it would not be practical to place a bus lane here. An alternative would be to restrict the nearside lane to left turners with buses allowed to go ahead. This would remove the merge. This will need to be modelled and subject to no significant reduction in capacity I will submit a revised proposal at stage 2.

RSA TEAM COMMENTS [1]

The alternative option to restrict the nearside lane to left turners with buses allowed to go ahead [to remove the merge] as suggested by the Design Team is acceptable at this stage. Confirmation will be needed from the Design Team whether or not this proposal is being progressed to detailed design [subject to no significant reduction in capacity] before the Stage 1 Audit can be closed. If the option is to be progressed, details will be examined at Stage 2 of the Audit. Alternatively, if the option is not to be progressed because of capacity then an Exception Report will be needed in respect of this item before the [Stage 1] Audit can be closed.

Any accident details in connection with the previous bus lane [for a respective time period or before and after dates] should be requested from Lewis Hill in the Road Safety Team.

DESIGN TEAM RESPONSE [2]

Confirmation is given that this proposal, restricting the nearside lane to left turners with buses being allowed to go ahead, will be progressed at detailed design [subject to no significant reduction in capacity].

RSA TEAM COMMENTS [2]

Whilst the revised proposals are generally acceptable at this Stage 1 Audit, the Design Team does not make it clear if there would be any reduction in capacity resulting from modelling at this stage - see Design Team Comments [1]. The RSA Team feels that it would be better to determine this now at the preliminary design stage rather than waiting until detailed design and having to review at Stage 2 of the Audit - as understood from the Design Team Response [2].

The Design Team is requested to clarify this issue before consideration can be given to closing the Stage 1 Audit without an Exception Report being provided.

DESIGN TEAM RESPONSE [3]

Confirmation is given that this proposal, restricting the nearside lane to left turners with buses being allowed to go ahead, will be progressed at detailed design.

RSA TEAM COMMENTS [3]

This is acceptable and addresses the concerns of the RSA Team. The revised proposals can be examined at the Stage 2 Audit.

4.2 PROBLEM

Location: 4.2 on Plan TE/16-376/BN729/ST1/01 at Appendix B – Attercliffe Common southwest bound approach to existing NMU crossing

Summary: Provision of bus-lane may lead to increased likelihood of blocked visibility to nearside primary signal head

The proposed layout will result in a southwest bound bus-lane passing through the existing controlled crossing located to the southwest of the Howden Road junction, with two lanes formed. The presence of buses to the nearside of general traffic could block forward views to the nearside primary signal head on the approach to the crossing, and of waiting pedestrians (depending upon vehicle positioning). The forward views of drivers in the general traffic lane would be taken away from the primary signal head regardless of the presence of buses. If stationary buses were present in the bus-lane at the stop-line, drivers waiting in the offside lane would find it far more difficult to view the primary signal aspect away to their nearside.

The Audit Team is concerned that operational safety of the crossing could be adversely affected by the bus-lane for the reasons given, and that the likelihood of pedestrian accidents could increase as a result.

RECOMMENDATION

Take measures to increase the conspicuity of the signals for southwest bound drivers both on the approach to, and at the crossing.

Provide high visibility aspects, a far-sited nearside secondary signal head, and/or a duplicate (high mounted) nearside aspect.

DESIGN TEAM RESPONSE [1]

Noted, will be included in detailed design and proposals submitted at the Stage 2 Audit.

RSA TEAM COMMENTS [1]

Accepted.

ATTERCLIFFE COMMON / CARBROOK STREET JUNCTION

Problems apply to drawing TM-BN729-C4-2.1

4.3 PROBLEM

Location: Not referenced on plan at Appendix B – Attercliffe Common Junction with Carbrook Street

Summary: Mixed controlled / non-controlled provision within same junction increases risk for users

The bus-only right-turn from Carbrook Road to Attercliffe Common is the only movement at the above junction proposed to be traffic signal controlled. The left-turn out of and left-turn in to Carbrook Road would continue to run as priority controlled junctions. Mixed signal / priority control within a single junction increases the likelihood of driver confusion about priorities, and can increase the likelihood of collisions.

Additionally, under the new layout pedestrians walking along Attercliffe Common would have the opportunity to safely cross the bus-only right-turn stream from Carbrook Street in the centre of the side-road junction (at times when buses were held). Such a safe opportunity would not exist at the other two crossings. Furthermore, this mixed arrangement for pedestrians could confuse more vulnerable users increasing the risk of headless crossing movements (e.g. by the elderly / disabled).

The site visit revealed that the current uncontrolled pedestrian crossing of the Attercliffe Common left-turn to Carbrook Street stream was difficult. Drivers diverge left from Attercliffe Common at speed into Carbrook Street; forward visibility of these approaching vehicles is limited, and speeds are difficult to judge as the vehicles approach around the sweeping bend.

RECOMMENDATION

Preferably signalise all movements at the junction and provide controlled pedestrian crossings of all legs. 'Free' crossings of the two Attercliffe Common carriageways could be incorporated via the central reservation (if demand exists here).

DESIGN TEAM RESPONSE [1]

These signals are provided so Sheffield BRT vehicles travelling to Rotherham can join Attercliffe Road. The frequency of the service is 10 minutes increasing to 5 minutes in the peak periods. Signalising all movements and incorporating pedestrian signals will affect the capacity of Attercliffe Road significantly. The pedestrian footfall in this area is low and the cost of providing pedestrian facilities will disproportionately increase costs significantly. The existing flows left from Carbrook street are very low, allowing them to turn on a give way is a more proportionate response.

For these reasons I do not feel that signalling the pedestrian crossings is necessary and that the existing situation will not be made worse.

RSA TEAM COMMENTS [1]

Whilst there are no recorded injury accidents involving pedestrians at this junction, pedestrians crossing from the western side of Carbrook Street are nevertheless vulnerable because of the speed of left turners into Carbrook Street.

DESIGN TEAM RESPONSE [2]

Even though the initial junction design did not make this situation any worse, a revised layout, see plan TM-BN729-C4-2.1B, has been produced that provides a left turning lane from Attercliffe Common into Carbrook Street. This should reduce the speed of turning vehicles through a tighter radius of turn and allow pedestrians to more easily determine whether vehicles are intending to turn left or not when deciding to cross.

RSA TEAM COMMENTS [2]

This is now accepted.

As an absolute minimum, signalisation of the left-turn from Attercliffe Common to Carbrook Street should be introduced, with an associated controlled NMU crossing point for this dangerous crossing movement. At times when the bus right turn from Carbrook Street is running, there will only be enough space for a single northeast bound vehicle to wait at the Attercliffe Common stop-line before the left-turn to Carbrook Street becomes blocked. In light of this, adverse capacity implications from providing signal control for this left-turn would be very limited.

DESIGN TEAM RESPONSE [1]

It is not proposed to materially change the existing pedestrian crossing from that which operates currently in the new design, i.e. existing kerb lines and dropped crossings on the splitter island and nearside kerb will remain as is. The provision of a signalled crossing as mentioned above will increase the time when Attercliffe Road traffic is held at red and will affect capacity of the link significantly. I accept that it is difficult to cross from the western side of Carbrook Street, but the few pedestrians that do so take extra care and have few problems. For these and the reasons given above I do not propose to incorporate formal pedestrian facilities into the junction at this time.

RSA TEAM COMMENTS [1]

If the recommendation in this report option cannot be progressed, an Exception Report will be needed in respect of this item before the [Stage 1] Audit can be closed.

DESIGN TEAM RESPONSE [2]

The revised layout, see plan TM-BN729-C4-2.1A, improves the existing crossing facility by reducing vehicle speeds and making the intention of drivers clearer. The frequency of the BRT service would change the signals every 10 minutes but if signalled crossings were provided this would increase the frequency of traffic being stopped on Attercliffe Road and significantly affect capacity. Given that the situation will in fact be improved in safety terms for pedestrians crossing Carbrook Street the revised arrangement I suggest that this be taken forward to detailed design.

RSA TEAM COMMENTS [2]

After further consideration, the revised layout is now accepted by the RSA Team, in view of the circumstances outlined by the Design Team.

4.4 PROBLEM

Location: 4.4 on Plan TE/16-376/BN729/ST1/02 at Appendix B – Attercliffe Common Junction with Carbrook Street

Summary: Right-only cycle-lane layout could be misread / dangerous

There is a short length of cycle lane proposed to the offside of the left-turn stream from Carbrook Road to Attercliffe Common, intended to encourage cyclists to access the off-carriageway shared use footway to the southwest of the junction. A right-turn arrow is proposed towards the end of the lane, indicating to cyclists the need to enter the traffic-island and cross through the junction mouth. Due to the close proximity of the arrow to the main Attercliffe Common carriageway, there is a concern that cyclists may interpret the arrow as instructing them to turn right into Attercliffe Common into the opposing flow, with inherent risk. Furthermore, cyclists may interpret the arrow as an instruction to turn right through the central reservation gap, in conflict with buses and other traffic streams.

RECOMMENDATION

Remove the currently proposed cycle-lane. Provide an alternative short length of advisory cycle lane within the bus-lane junction approach, adjacent to the offside traffic island (widen if necessary / possible). In advance of the stop-line, direct cyclists to their right onto the traffic island to a shared use area, and across to the south-western verge of the junction with other NMUs, to join the shared route beyond. Clear signage would be required to inform cyclists that they cannot use the central reservation gap beyond the bus-lane to cross Attercliffe Common.

DESIGN TEAM RESPONSE [1]

Noted and will be incorporated at detailed design and proposals submitted at the Stage 2 Audit.

RSA TEAM COMMENTS [1]

This is accepted.

Also, appropriate shared use signage / cycle symbols / tactile paving should clearly indicate to all NMUs new areas of shared use.

DESIGN TEAM RESPONSE [1]

Noted and will be incorporated at detailed design and proposals submitted at the Stage 2 Audit.

RSA TEAM COMMENTS [1]

This is accepted.

Moreover, a reverse route should be promoted from the shared route on Attercliffe Common into Carbrook Street.

DESIGN TEAM RESPONSE [1]

Noted and will be incorporated at detailed design and proposals, if necessary, submitted in stage 2. NB. Signing of the TPT route already exists and this will be maintained in the design.

RSA TEAM COMMENTS [1]

This is accepted.

DUNLOP STREET / CARBROOK STREET JUNCTION

Problems apply to drawing TM-BN729-C4-3.1

4.5 PROBLEM

Location: 4.5 on Plan TE/16-376/BN729/ST1/03 at Appendix B – Carbrook Street / Dunlop Street junction

Summary: Proposed junction layout could result in a risk of a number of accident types

The proposed layout is intended to give traffic travelling along Dunlop Street priority over traffic travelling along Carbrook Street. Site observation suggests that traffic volumes travelling along Carbrook Street are significantly higher than those travelling via Dunlop Street, and furthermore that vehicles travel at relatively high speeds along Carbrook Street through this area.

The new Carbrook Street northbound stream would by-pass the Dunlop Street junction via a short, straight-ahead slip-lane, forming a 'left-turn' priority junction with no deflection at the *Give-way* line. There is a concern that under the new layout vehicles travelling north along Carbrook Street past this area would fail to *Give-way* at the end of the slip-lane due to the alignment of the junction, with a risk of high speed overshoot accidents.

Moreover, under the new layout vehicles travelling south along Carbrook Street wishing to continue to Attercliffe Common would be forced to negotiate a tight bend to the left prior to accessing a new priority junction at Dunlop Street. This bend would be hazardous due to its alignment and limited forward visibility to it around the preceding bend, particularly when it is initially introduced and drivers are unfamiliar.

The priority junction beyond has been shown with a layout that could be difficult to negotiate for right-turners. The layout would bring traffic to the junction at an angle biased for executing left turns; right turners would be forced to swing wide into Dunlop Street with an inherent risk over running the opposing carriageway.

RECOMMENDATION

Remove the proposed slip-lane and force northbound drivers to negotiate the bend to the right, and then to turn left into Carbrook Street at the junction to the east of the proposed slip-lane. This junction mouth should be widened and the radii increased to accommodate this manoeuvre, and the right-turn from Carbrook Street southbound.

DESIGN TEAM RESPONSE [1]

Unfortunately this is used by articulated lorries, delivering and picking up from Howco. Whilst noting your concerns it may be difficult to resolve in practice. An alternative would be to ban the right turn into Carbrook Street from Dunlop Street, thereby removing the conflict. This will be looked at during detailed design and revised proposals will be submitted at the Stage 2 Audit.

RSA TEAM COMMENTS [1]

Banning the right turn into Carbrook Street alone from Dunlop Street, for consideration at Stage 2 of the Audit, is not accepted as a suitable response at this [Stage 1] Audit. No evidence has been supplied in the form of Auto-track drawings to show that the recommended option for re-aligning the junction is not feasible. Such a layout would reduce the outlined conflicts associated with the 'left-turn' priority at the junction for traffic from Attercliffe Common and would also possibly permit all movements involving articulated vehicles.

The Design Team is therefore requested to further investigate the feasibility of the recommended layout for the junction and subject to the option being feasible, submit revised details of the junction for examination before consideration can be given to closing this [Stage 1] Audit. Alternatively, if the option is not feasible then copies of any Auto-track drawings should be sent to the RSA Team to confirm this. If for any other reason the recommended option cannot be progressed, an Exception Report should be submitted to the RSA Team before the Stage 1 Audit can be closed.

DESIGN TEAM RESPONSE [2]

A new alignment/layout of the junction, see plan TM-BN729-C4-3.1A, has been developed that addresses all the issues raised above. The intention is to take this forward to detailed design.

RSA TEAM COMMENTS [2]

This is accepted.

Provide extensive signing / marking measures to clearly communicate the new layout / priorities to drivers on Carbrook Street. Consider using advanced local advanced direction signs on Carbrook Street of a map-type layout, depicting the new junction layout / bends in alignment. Provide appropriate temporary new layout warning signs following completion.

DESIGN TEAM RESPONSE [1]

Noted and will be incorporated at detailed design and proposals submitted at the Stage 2 Audit.

RSA TEAM COMMENTS [1]

This is accepted.

DUNLOP STREET / WEEDON STREET JUNCTION

Problems apply to drawing TM-BN729-C4-4.1

4.6 PROBLEM

Location: Not referenced on plan at Appendix B – Scheme Limits

Summary: Excessive on-street parking throughout area could increase risk of a number of accident types

The Stage 1 Audit site visit revealed that on-street parking is prevalent along the southern verge of Weedon Street throughout the limits of the proposals. There are also bus-stops located on Weedon Street within the scheme limits. The proposals include the provision of traffic islands associated with the traffic signals, and central hatched ladder markings extending to/from these islands with sheltered right-turn lanes for side roads. This would effectively narrow the through lanes on Weedon Street down to as low as 3m.

The Audit Team is concerned that parking would lead to vehicles being forced to encroach into the central hatched areas and right-turn lanes, with associated risk. Parking in close proximity to the islands could block the junctions, and/or inhibit views of pedestrians crossing through the islands. Conflicts between stationary buses and vehicles travelling through the junctions may also occur.

RECOMMENDATION

Provide extensive waiting / loading restrictions to ensure the new layout can operate safely. Consider the on-street bus-stops in the context of junction operation under detailed design.

DESIGN TEAM RESPONSE [1]

Noted and will be incorporated at detailed design and proposals submitted at the Stage 2 Audit.

RSA TEAM COMMENTS [1]

This is accepted.

End of Problems identified and Recommendations offered in this Stage 1 Safety Audit

5.0 Audit Team Statement

I certify that this Audit has been carried out in accordance with the Sheffield City Council Road Safety Audit Standard 2005.

AUDIT TEAM LEADER FOR THIS AUDIT

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DEL
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Signed:



Dated: 19 March 2010

AUDIT TEAM MEMBER [author of this report]

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Consultant Road Safety Engineer
Transport and Highways
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Appendix A

Audit Brief, drawings and documents

Document Reference: Memorandum dated 29 September 2009. Audit Brief included.

List of Information considered in this Stage 1 Safety Audit;

Preliminary Design G.A. Drawings: -

- TM-BN729-C4-1.1 Attercliffe Common / Clay Street
- TM-BN729-C4-2.1 Attercliffe Common / Carbrook Street
- TM-BN729-C4-3.1 Carbrook Street / Dunlop Street
- TM-BN729-C4-4.1 Weedon Street / Dunlop Street

Other Documents: -

- Safety Audit Brief from Chris Galloway : - Principal Engineer; Traffic Management (See following page for details)
- TM-BN729-C4-3-1A Revised proposals supplied 20 January 2010
- TM-BN729-C4-2-1A Revised proposals supplied 20 January 2010

BUS RAPID TRANSPORT (BRT) SCHEME
NORTHERN ROUTE – SECTION FROM ROTHERHAM BOUNDARY TO THE WICKER

ROAD SAFETY AUDIT STAGE 1
AUDIT BRIEF

1. **Drawing** – see below
2. **History** – The proposals form part of the BRT scheme, which is an exciting idea to improve public transport between Sheffield and Rotherham. BRT is all about providing an enhanced travel system, which is very comfortable, reliable, affordable and quick. The BRT buses would only stop at a limited number of places along the route making the journey between Rotherham and Sheffield quicker and more convenient.

As well as helping to meet existing travel needs, BRT North would help to support long term development strategies in the districts such as the [Rotherham Renaissance Masterplan](#), [Sheffield City Centre Masterplan](#), the [Lower Don Valley Masterplan](#) and the [River Don District Development](#).

The scheme is being developed jointly by Sheffield City Council, Rotherham Metropolitan Borough Council and South Yorkshire Passenger Transport Executive, and will be submitted to the Department for Transport early next year for funding approval. A period of public consultation on the scheme has recently drawn to close.

3. **Scheme details** – These specific plans form part of the BRT North Route, which runs between the two district centres through the Wicker, Attercliffe, Carbrook, Meadowhall and Templeborough. The proposed route also includes a new link road beneath the M1 Tinsley viaduct connecting Sheffield Road to Meadowhall Way, to help traffic and improve access to existing and new developments. NB. At existing signal controlled junctions and pedestrian/cycle facilities along the route, virtual bus priority will be implemented which will enable the BRT buses to pass seamlessly through them without delay.

4. **Proposals** –

- 4.1 **Meadowhall Drive/Weedon Street Junction (TM-BN729-C4-4-1)**

It is proposed to signalise this junction to allow priority for the BRT buses to be implemented. It involves widening the carriageway on Meadowhall Drive and improvement of the radii with Weedon Street. The signals will work in conjunction with the new signals proposed for the junction of Dunlop Street/Weedon Street to move the BRT buses quickly through the junctions.

4.2 Weedon Street/Access to Howco (TM-BN729-C4-4-1)

It is proposed to improve the radii on this access so that HGVs can turn into and out of the site without having to use the full width of Weedon Street. It is also proposed to restrict parking and loading along Weedon Street between the Meadowhall Drive and Dunlop Street junctions to keep the carriageway clear of any obstructions to the free flow of traffic.

4.3 Dunlop Street/Weedon Street Junction (TM-BN729-C4-4-1)

It is proposed to signalise this junction to allow priority for the BRT buses to be implemented. The signals will work in conjunction with the new signals proposed for the junction of Meadowhall Drive/Weedon Street to move the BRT buses quickly through the junctions.

4.4 Dunlop Street/Carbrook Street Junction (TM-BN729-C4-3-1)

It is proposed to realign the carriageway such that priority is given to the Carbrook Street/Dunlop Street route thereby providing an uninterrupted flow for the BRT buses. This means that traffic travelling south on Carbrook Street will have to give way. The western end of Webster Street will also be realigned such that traffic can only turn right onto Carbrook Street when emerging from it.

It is proposed to implement no waiting and loading restrictions throughout this section to keep it free of any obstructions.

4.5 Carbrook Street/Attercliffe Common Junction (TM-BN729-C4-2-1)

It is proposed to create a signalised right turning facility for buses only from Carbrook Street in to Attercliffe Common. All existing manoeuvres will be maintained for all vehicle types. No waiting and loading restrictions will be required on Carbrook Street between its junction with Dunlop Street and Attercliffe Common to keep it free of any obstructions.

4.6 Attercliffe Road/Clay Street Junction (TM-BN729-C4-1-1)

It is proposed to create pre-signals for buses in advance of the existing signals at Newhall Road. The bus lane previously removed will be reinstated between Collieridge Road and this facility to provide an unobstructed route into the pre-signals. This will also be where new bus stops for the BRT buses will be sited and signalised pedestrian facility is incorporated into the pre-signals.

To reduce conflicting movements and potential temporary obstructions to traffic travelling along Attercliffe Road/Common it is proposed to close off the ends of Clay Street and Fell Road.

5. Accident data – Accident data hasn't been considered.

6. **Previous RSA Reports** – The new link road and the junctions either end with Meadowhall Way and Sheffield Road have been submitted previously by Highways Design.

C J Galloway

Principal Engineer – Traffic Management
29th Sept 2009

Appendix B

Problem Location Drawings

List of Drawings:

- TE/16-376/BN729/ST1/01 Problem Locations Plan 1 of 4
(Attercliffe Common / Clay Street)
- TE/16-376/BN729/ST1/02 Problem Locations Plan 2 of 4
(Attercliffe Common / Carbrook Street)
- TE/16-376/BN729/ST1/03 Problem Locations Plan 3 of 4
(Carbrook Street / Dunlop Street)
- TE/16-376/BN729/ST1/04 Problem Locations Plan 4 of 4
(Weedon Street / Dunlop Street)