Bermuda Connection Project

Road Safety Audit Stage 2 Report

Warwickshire County Council

14 December 2017

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Table of contents

1. Introduction

This report includes the responses to the Stage 2 Road Safety Audit produced in connection to the Bermuda Connector Project. The RSA report is included in **Appendix A**.

2. Designer Responses

2.1. St Georges Way (SGW) shared cycle/footway link

Summary: Proposed width of shared cycle/footway too narrow

The proposed shared cycle/footway is designed to a 2.5m width which is below the standard identified in LTN 1/12. In addition, the provision of new streetlighting columns which appear to be located on this cycle/footway will also further reduce effective width at intervals.

It is recognised in section 3.1 (4) above that the proximity of Network Rail's boundary has caused issues for the design of the cycle/footway. However, the narrowness of the design may result in pedestrian and cyclist collisions on the shared footway or force pedestrians or cyclists into the carriageway with a potential for collisions with vehicles therein.

At the rail station, where the proposed shared footway ends, the width of the existing footway decreases further. This may lead to further conflict between pedestrians and dismounted cyclists leading to potential collisions or users being forced into the carriageway with a potential for collisions with vehicles.

Recommendation: It is recommended that the shared cycle/footway is designed so as to provide safe passage for all users.

Designers Response

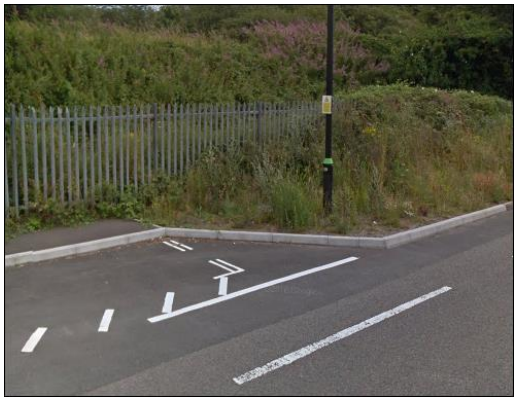
There are several constraints present on site that limit the availability of land to accommodate a shared cycle/footway to the standard minimum width. The current proposal is based on the maximum width available for a facility without impacting on the Network Rail boundary due to associated retaining wall works.

Atkins recognises that a shared cycle/footway needs to provide a safe passage for all users however to do so will require an additional cost and significant impact on programme.

As instructed by WCC, due to the proximity to the Network Rail boundary, the width of the of the cycleway has been reduced to 2.5m to remove any potential impact on the boundary by the works.

As part of a separate future scheme, the provision of an off-street car parking area for Bermuda Park Rail Station will be progressed separately. The potential delivery of this initiative will include the vast majority of the current on-street car parking spaces on St Georges specifically for the rail station being removed, which will enable the section of the shared cycle/footway to be widened further in front of the railway station; which will be implemented as part of the separate scheme.

2.2. SGW shared cycle/footway tie in to existing footway near Bermuda rail station



Summary: No details provided for access to/from carriageway to proposed shared cycle/footway.

The proposed shared cycle/footway ends just north and just south of the new Bermuda rail station. There are no details provided of how cyclists wishing to rejoin or leave the carriageway at this point may do so, e.g. via dropped kerbs at the termination of the shared route.

This increases the likelihood of those cyclists wishing to rejoin the carriageway falling off as they negotiate a full kerb. In addition any cyclists who have been on the carriageway but wishing to access the rail station may be forced to dismount to negotiate the kerb, thus delaying their exit from the carriageway and increasing the likelihood of vehicle/cyclist collisions.

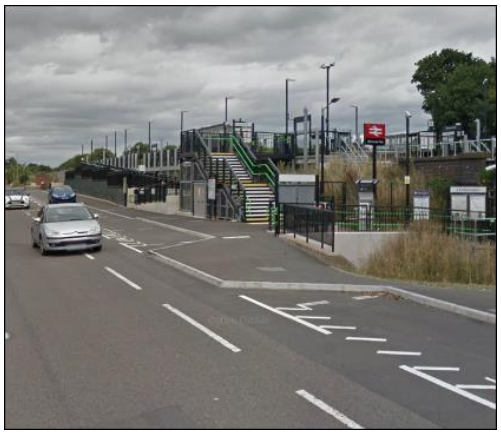
Recommendation: It is recommended that appropriate dropped kerb accesses are provided at suitable points close to the rail station to provide safe access to and egress from the carriageway.

Designers Response

Disagree. Atkins do not recommend on providing drop-down kerbs at this location as this might encourage northbound cyclists to swerve into the opposing carriageway lane of oncoming traffic.

The provision of an off-street car parking facility for Bermuda Park Rail Station is being progressed separately from this scheme. The potential delivery of this initiative will include the complementary provision of suitable pedestrian crossing facilities on St Georges Way to support pedestrian connectivity between the off-street car park and the rail station.

2.3. St Georges Way by Bermuda rail station



Summary: Lack of suitable crossing point for pedestrians and cyclists

The scheme does not appear to show any dropped kerb or uncontrolled crossing point, such as a pedestrian refuge, directly outside the exit from Bermuda rail station.

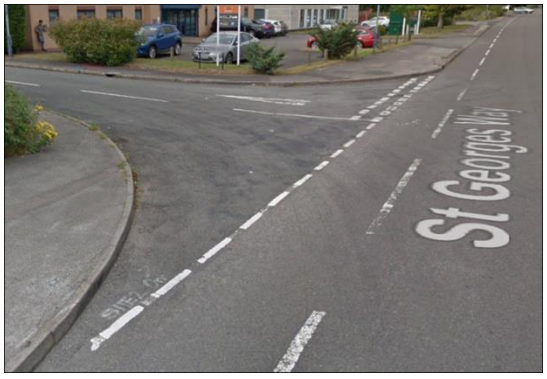
This may lead to pedestrians and/or cyclists choosing to cross at less suitable points, such as at or close to the various junctions which serve the industrial sites to the west of St Georges Way. As a result, an increase in vehicle/pedestrian collisions is likely.

Recommendation: It is recommended that a safe crossing point is identified close to the rail station to allow commuters and cyclists to safely cross St Georges Way.

Designers Response

The provision of an off-street car parking for Bermuda Park Rail Station is being progressed separately from this scheme. The potential delivery of this initiative will include the complementary provision of suitable pedestrian crossing facilities on St Georges Way to support pedestrian connectivity between the off-street car park and the rail station.

2.4. Various entrances to side roads on St Georges Way



Summary: Lack of suitable crossing points for pedestrians

The scheme does not appear to show any dropped kerbs on the entrances to the various side roads off the west side of St Georges Way. Burlington Road is one example.

This may lead to access difficulties for pedestrians with mobility and visibility issues and increase the likelihood of trips and falls.

Recommendation: It is recommended that safe crossing points are provided at the various roads and entrances which interrupt the western footway of St Georges Way**.**

Designers Response

The provision of an off-street car parking for Bermuda Park Rail Station is being progressed separately from this scheme. The potential delivery of this initiative will include the complementary provision of suitable pedestrian crossing facilities on St Georges Way to support pedestrian connectivity between the off-street car park and the rail station, including enhancements to crossing points at the various roads and entrances which interrupt the western footway of St Georges Way.

2.5. End of cycle route close to Bermuda Rd and The Bridleway

Summary: Tie in between end of cycle route and new footway alignment

Dwg 5147469-ATK-BCP-DR-D-121 Rev F shows a realignment of the north end of Bermuda Rd and a substantial redevelopment of the footway to the west of Bermuda Rd.

It is not clear how the existing cycle route will tie in with the new road alignment and footway. This may lead to an increase in pedestrian and cyclist collisions, especially since there is an uncontrolled crossing proposed for the same area.

Recommendation: It is recommended that the existing cycle route is tied into the proposed new alignment and footway development to provide a clearer demarcation of the route for pedestrians and cyclists in this area.

Designers Response

The existing shared cycle/footway on Harefield Lane will meet the footway adjacent to the new Bermuda Road alignment, as it currently does. The existing footway will be widened but will remain as a footway only. The “end of cycleway” infrastructure that is currently on site will therefore remain in place.

2.6. Various entrances to side roads on Bermuda Road

Summary: Lack of suitable crossing points for pedestrians

The scheme does not appear to show any dropped kerbs on the entrances to the various side roads off the west side of Bermuda Road. Hazell Way is one such example.

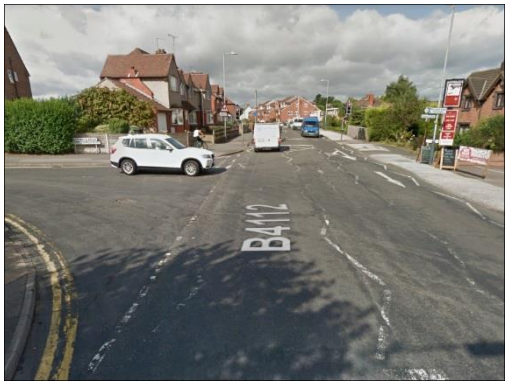
This may lead to access difficulties for pedestrians with mobility and visibility issues and increase the likelihood of trips and falls.

Recommendation: It is recommended that safe crossing points are provided at the various roads and entrances which interrupt the western footway of Bermuda Road.

Designers Response

This recommendation is deemed to be outside the scope of the proposed works as none of the footway north of the Hazell Way junction will be amended as part of this scheme, and therefore will be as per the current situation. Where highway works are being completed tactile crossings have been introduced.

2.7. Junction of Heath End Road and Bermuda Road



Summary: Lack of keep clear markings on Heath End Road

The scheme does not appear to show any proposals to install keep clear markings on the junction of Heath End Road and Bermuda Road. Opening up of the connection between Griff roundabout and west Nuneaton may result in increased traffic levels along Bermuda Rd and Heath End Road. Westbound traffic may queue back from the mini-roundabout and the controlled crossing leading to the turn into Bermuda Road becoming blocked.

This may lead to an increase in collisions between vehicles attempting to turn into and out of Bermuda Rd from the B4112 Heath End Road.

Recommendation: It is recommended that road markings are provided to keep the junction clear.

Designers Response

Agreed, “Keep Clear” road markings will be incorporated into the design.

Appendix A. WCC Stage 2 RSA

Stage 2 Detailed Design Road Safety Audit

Getting West Nuneaton Moving: Bermuda Connection

Bermuda Park, Nuneaton

03 November 2017

Audit No. RSA 2399

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CONTENTS

1.0 INTRODUCTION

1.1 This report results from a Stage 2 Road Safety Audit covering proposals to tackle congestion and improve access to/from west Nuneaton. The scheme involves the provision of a direct highway link between west Nuneaton and Griff roundabout on the A444. This will require improvements to an existing bridge over the A444, currently unused by motor traffic, and improved connections to existing local roads.

The scheme incorporates a number of different measures, including the improvement and refurbishment of the existing bridge, highway works on the new link itself and the highway infrastructure at either end of the route. The scheme also makes improvement to non-motorised user provisions along St Georges Way and Bermuda Rd through a shared-use cycle and pedestrian footway.

1.2 The Road Safety Audit Team, staff members from Warwickshire County Council were as follows:

Lee Williams
Audit Team Leader

Jon Rollinson
Audit Team Member

We confirm that no member of the Audit Team has been involved with the design process.

1.3 A site visit was carried out on Tuesday, 31 October 2017. The weather during the site visit was cloudy with a dry carriageway surface. Traffic flows were noted as being very light. Pedestrian flows were noted as being very light. All the roads in the scheme are currently subject to a 30mph speed limit.

1.4 The drawings and documents supplied for audit are listed in Appendix A.

1.5 The Audit Team acknowledge that the detailed design produced by the Principal Designer was in accordance to CIHT Manual for Streets II highway standards.

1.6 However, the audit has been carried out in accordance with Warwickshire County Council's safety audit procedures. These procedures largely follow those recommended in document HD 19/15 – 'Road Safety Audit' of The Highways Agency's Design Manual for Roads and Bridges.

1.7 The Principal Designer provided the following table for clarification purposes in regard to the Departures from Standards specified in the brief, in acknowledgement that the scheme has been designed in accordance to CIHT Manual for Streets II standards:

Ref	WCC Query	Atkins Response
1	***Heath End Road / Tenlons Road Junction:***	
1.1	What design standard is the suggested Departure from Standard for this junction referring to (1) Design Manual for Road and Bridges or (2) CIHT Manual for Streets II?	Design Manual for Roads and Bridges (DMRB).
1.2	The scheme has been designed in accordance to CIHT Manual for Streets II, and therefore, why is non-compliance with inter-visibility requirements in respect to TD50/04 DRMB standard mentioned in the brief?	CIHT Manual for Streets 2 refers to DMRB TD 50/04, stating that it contains the relevant detailed guidance for traffic signal control junctions.
1.3	Is the junction compliant with CIHT Manual for Streets II standards?	Manual for Streets II does not specify any specific visibility requirements but refers the designer to TD 50/04, whilst it recognises that existing site conditions may not allow for full inter-visibility to be achieved.
2	***Vehicle Restraint System (VRS) Provisions:***	
2.1	What design standard is the suggested Departure from Standard for this junction referring to (1) Design Manual for Road and Bridges or (2) CIHT Manual for Streets II?	Design Manual for Roads and Bridges (DMRB).
2.2	The scheme has been designed in accordance to CIHT Manual for Streets II, and therefore, why is non-compliance with DMRB standard TD19/06 mentioned in the brief?	Manual for Streets II does not assess VRS requirements, and therefore, the previously adopted TD 19/06 assessment has been maintained.
2.3	Are the VRS provisions in the scheme compliant with CIHT Manual for Streets II standards?	Manual for Streets II does not give advice on vehicle restraint systems.

3	***Visibility Assessment: Tenlons Road Stopping Sight Distance through Bend:***	
3.1	According to the brief, this issue is non-compliant with CIHT Manual for Streets II highway design standards, which is accepted.	
4	***St Georges Way Shared Cycle / Footway (2.5 metres width section only):***	
4.1	What design standard is the suggested Departure from Standard referring to (1) Design Manual for Road and Bridges or (2) CIHT Manual for Streets II?	Design Manual for Roads and Bridges (DMRB).
4.2	Is the section of shared pedestrian / cycle facility compliant with CIHT Manual for Streets II standards?	Manual for Streets II refers the designer to design in accordance with Local Transport Note 2/08 Cycle Infrastructure. This guidance states that the preferred minimum width is 3m. However additional width is required where there is an edge constraint, i.e. kerb edge, boundary fence, etc. Therefore the width that can be achieved is a non-compliance with Manual for Streets II.

1.8 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. All comments and recommendations are referenced to the design drawings and documents supplied with the brief.

1.9 In accordance with Warwickshire County Councils Road Safety Audit procedures, it is a requirement that the Design Team in conjunction with the Project Sponsor prepare a Road Safety Audit Response Report, in response to the recommendations made within this audit. This should be completed and a copy of the final report sent to the Audit Team Leader for their information by 24 November 2017. For any recommendations that are not being adopted, the Design Team or Project Sponsor should notify the Audit Team Leader and discuss these issues to try to achieve a mutually agreed compromise. If an agreement cannot be reached, the Project Sponsor should then submit an Exception Report to the Head of Transport and Economy for Warwickshire for

their decision. If an Exception Report is required, a narrative of the exchanges between the Design Team, Project Sponsor and Audit Team Leader should be detailed and submitted alongside the Exception Report to the Head of Transport and Highways for their information.

2.0 PROPOSED SCHEME

2.1 The proposed scheme consists of a number of different measures, the key features include the improvement and refurbishment of the existing bridge, Highway works both on the new link itself and the highway infrastructure at either end of the route. The scheme also makes improvement to non-motorised user provisions along St Georges Way and Bermuda Rd through a shared-use cycle and pedestrian footway.

3.0 DEPARTURES FROM STANDARD

3.1 The following departures from standards were notified:

1. Heath End Rd/Tenlons Road junction

   The criterion is not met by the existing layout of this junction which is currently a signalised junction. This is due to the close proximity of the existing buildings. It is not proposed to make any adjustments to the existing buildings' layouts.

   Justification

   Full compliance with the standard would result in an extensive level of building demolition at the junctions and significant loss of housing and employment opportunities. These junctions are already part of the existing highway network, and motorists are already familiar with their layout.

2. Vehicle restraint system (VRS) provisions

   TD19/06 prescribes a minimum of 30m and 7.5m VRS length to be provided in advance and beyond a hazard, respectively. The culvert outside Bermuda train station on St Georges Way is identified as a hazard as per Road Restraint Risk Assessment Assessment Process (RRRAP). However, these minimum length requirements cannot be achieved due to the existing accesses to private properties on the west side, and footpaths on the east side of the carriageway.

   The proposed length of full height VRS is about 8m in advance of the hazard on the west side of the carriageway. The length is zero both in

advance and beyond the hazard on the east side of the carriageway. These are departures from standard.

Justification

The culvert is an existing hazard. The existing scenario is not worsened by providing the possible length of VRS.

Full compliance with TD19/06 is not practical in the scheme. Mitigation measures include:

- No traffic collisions at the culvert location previously
- Free flow speed data is currently just over 30mph, well below the 50mph limit above which RRRAP assessment becomes required. Speeds are expected to further reduce as a result of the newly constructed railway station, an expected increase in traffic as a result of the proposed new train station car park, the location of the proposed pedestrian crossing.

3. Non-compliance: visibility assessment

   Stopping sight distance through the bend on Tenlons Road in a southbound direction is not currently achieved without acquiring third party land and demolishing commercial buildings.

   The achieved forward visibility at this location is 25m which is not in compliance with Manual for Streets.

4. Non-compliance: St Georges Way shared cycle/footway

   Local Transport Note 1/12 recommends a minimum effective width of 3m for a shared cycle/footway. The feasibility of providing a full width 3.7m shared facility was considered to be high risk because of the proximity to the Network Rail boundary which would have significant cost and programme impacts if affected. WCC therefore instructed the design team to design 2.5m wide cycle/footways.

4.0 ITEMS ARISING FROM PREVIOUS AUDITS

4.1 Two previous audits have been carried out on the scheme as far as this audit team is aware and are available as RSA 2199, a Stage 1 road safety audit dated 12/6/2015 and RSA 2296, a Stage 2 road safety dated 29/9/2016.

In RSA 2199, 12 problems were identified and the design team provided a response to them.

In RSA 2296, 55 problems were identified and the design team provided responses to them.

5.0 ITEMS ARISING FROM THIS STAGE 2 AUDIT

5.1 PROBLEM

Location: St Georges Way shared cycle/footway link to Griff roundabout

Summary: Proposed width of shared cycle/footway too narrow

The proposed shared cycle/footway is designed to a 2.5m width which is below the standard identified in LTN 1/12. In addition the provision of new streetlighting columns which appear to be located on this cycle/footway will also further reduce effective width at intervals.

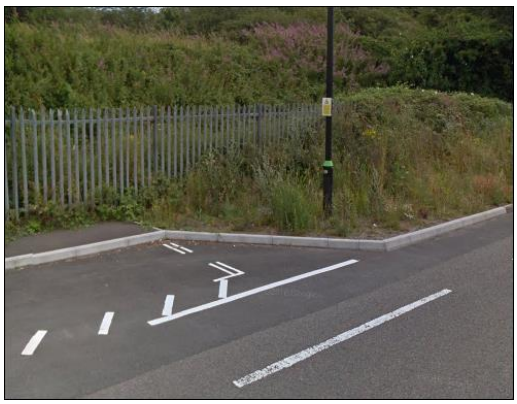
It is recognised in section 3.1 (4) above that the proximity of Network Rail's boundary has caused issues for the design of the cycle/footway. However, the narrowness of the design may result in pedestrian and cyclist collisions on the shared footway or force pedestrians or cyclists into the carriageway with a potential for collisions with vehicles therein.

At the rail station, where the proposed shared footway ends, the width of the existing footway decreases further. This may lead to further conflict between pedestrians and dismounted cyclists leading to potential collisions or users being forced into the carriageway with a potential for collisions with vehicles.

Recommendation: It is recommended that the shared cycle/footway is designed so as to provide safe passage for all users.

5.2 PROBLEM

Location: St Georges Way shared cycle/footway tie in to existing footway north and south of Bermuda rail station



Summary: No details provided for access to/from carriageway to proposed shared cycle/footway.

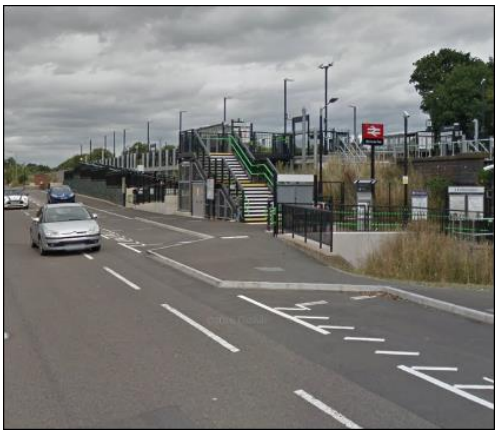
The proposed shared cycle/footway ends just north and just south of the new Bermuda rail station. There are no details provided of how cyclists wishing to rejoin or leave the carriageway at this point may do so, e.g. via dropped kerbs at the termination of the shared route.

This increases the likelihood of those cyclists wishing to rejoin the carriageway falling off as they negotiate a full kerb. In addition any cyclists who have been on the carriageway but wishing to access the rail station may be forced to dismount to negotiate the kerb, thus delaying their exit from the carriageway and increasing the likelihood of vehicle/cyclist collisions.

Recommendation: It is recommended that appropriate dropped kerb accesses are provided at suitable points close to the rail station to provide safe access to and egress from the carriageway.

5.3 PROBLEM

Location: St Georges Way by Bermuda rail station



Summary: Lack of suitable crossing point for pedestrians and cyclists

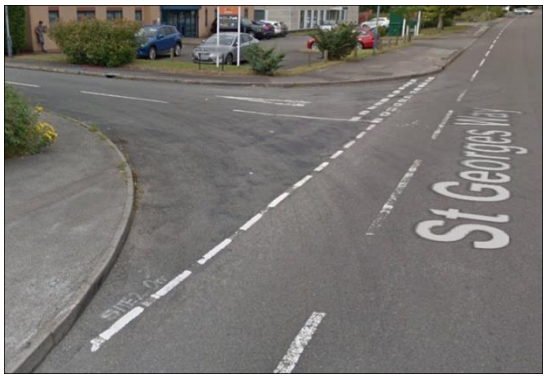
The scheme does not appear to show any dropped kerb or uncontrolled crossing point, such as a pedestrian refuge, directly outside the exit from Bermuda rail station.

This may lead to pedestrians and/or cyclists choosing to cross at less suitable points, such as at or close to the various junctions which serve the industrial sites to the west of St Georges Way. As a result, an increase in vehicle/pedestrian collisions is likely.

Recommendation: It is recommended that a safe crossing point is identified close to the rail station to allow commuters and cyclists to safely cross St Georges Way.

5.4 PROBLEM

Location: Various entrances to side roads and business premises on St Georges Way



Summary: Lack of suitable crossing points for pedestrians

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This may lead to access difficulties for pedestrians with mobility and visibility issues and increase the likelihood of trips and falls.

Recommendation: It is recommended that safe crossing points are provided at the various roads and entrances which interrupt the western footway of St Georges Way.

5.5 PROBLEM

Location: End of cycle route close to junction of Bermuda Rd and The Bridleway

Summary: Tie in between end of cycle route and new footway alignment

Dwg 5147469-ATK-BCP-DR-D-121 Rev F shows a realignment of the north end of Bermuda Rd and a substantial redevelopment of the footway to the west of Bermuda Rd.

It is not clear how the existing cycle route will tie in with the new road alignment and footway. This may lead to an increase in pedestrian and cyclist collisions, especially since there is an uncontrolled crossing proposed for the same area.

Recommendation: It is recommended that the existing cycle route is tied into the proposed new alignment and footway development to provide a clearer demarcation of the route for pedestrians and cyclists in this area.

5.6 PROBLEM

Location: Various entrances to side roads and business premises on Bermuda Road

Summary: Lack of suitable crossing points for pedestrians

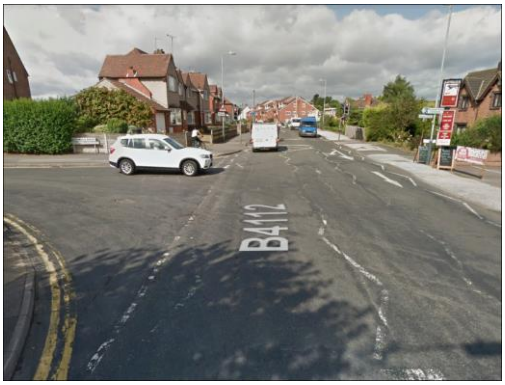
The scheme does not appear to show any dropped kerbs on the entrances to the various side roads off the west side of St Georges Way. Hazell Way is one such example.

This may lead to access difficulties for pedestrians with mobility and visibility issues and increase the likelihood of trips and falls.

Recommendation: It is recommended that safe crossing points are provided at the various roads and entrances which interrupt the western footway of St Georges Way.

5.7 PROBLEM

Location: Junction of Heath End Road and Bermuda Road



Summary: Lack of keep clear markings on Heath End Road

The scheme does not appear to show any proposals to install keep clear markings on the junction of Heath End Road and Bermuda Road. Opening up of the connection between Griff roundabout and west Nuneaton may result in increased traffic levels along Bermuda Rd and Heath End Road. Westbound traffic may queue back from the mini-roundabout and the controlled crossing leading to the turn into Bermuda Road becoming blocked.

This may lead to an increase in collisions between vehicles attempting to turn into and out of Bermuda Rd from the B4112 Heath End Road.

Recommendation: It is recommended that road markings are provided to keep the junction clear.

6.0 AUDIT TEAM STATEMENT

The audit has been carried out in accordance with Warwickshire County Council's safety audit procedures. These procedures largely follow those recommended in document HD 19/15 – 'Road Safety Audit' of The Highways Agency's Design Manual for Roads and Bridges. The problems identified have been noted in this report together with associated safety improvement suggestions which we recommend should be studied for implementation.

AUDIT TEAM LEADER

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Signed

Date: 03/11/2017

AUDIT TEAM MEMBER

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Signed

Date: 03/11/2017

APPENDICES

APPENDIX A

LIST OF DRAWINGS AND DOCUMENTS PROVIDED FOR AUDIT

- General Arrangement;
- Site Clearance;
- Guardrail & Safety Barrier;
- Geotech;
- Pavement;
- Kerbs and Footways;
- Traffic Signals;
- Structures;
- Stats;
- Visibility Splays; and
- Vehicle tracking.

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