ROAD SAFETY AUDIT RESPONSE REPORT FOR STAGE 1 (DMRB GG119)

F1. Project Details

Table F.1. Project Details

Report title:	*Western Bridge Link Road Phase 2 – Road Safety Audit Stage 1 Response Report*
Date:	*13 December 2023*
Document reference and revision	*WBLR-WSP-HGN-04-RP-C-0156 S3 – P02*
Prepared by:	*WSP*
On behalf of:	*Homes England*

TABLE F.2. AUTHORISATION SHEET

Project:	Western Bridge Link Road Phase 2
Report title:	*Western Bridge Link Road Phase 2 – Road Safety Audit Stage 1 Response Report*
Prepared by:	Kim Still
Position:	Associate
Organisation:	WSP
Date:	08/09/2023
Checked by:	David Hubbard
Position:	Senior Engineer
Organisation:	WSP
Date:	21/09/2023
Approved by:	Andrew Burrows
Position:	Associate Director
Organisation	WSP
Date:	26/09/23

F.2. Introduction

The Western Bridge Link Road (WBLR) scheme is part of a multi-phase infrastructure project, promoted by Homes England, to provide the infrastructure required for the Northern Arc Masterplan This Phase 2 of the scheme leads to the northeast of the Phase 1a roundabout (with the A2300) for a distance of approximately 460m. The alignment will descend towards a bridge over the river Adur, the extent of this phase is to Ch460m.

This Designers Response Report is to the Stage 1 Road Safety Audit Addendum carried out by WSP in August 2023 on WBLR Phase 2, document WBLR-WSP-HGN-04-RP-C-0155. The audit was to the design standard detailed within GG 119 of Volume 5, Section 2, Part 2, of the Design Manual for Roads and Bridges, as detailed by Highways England. The audit evaluated phase 2 of the scheme.

F.3. Key personnel

TABLE F.3. KEY PERSONNEL

Overseeing organisation:	*Stephen Gee – West Sussex County Council*
RSA Team:	*Katerina Ermilova – Audit Team Leader – WSP* *Huw Kear – Audit Team Member – WSP*
Design organisation:	*Andrew Burrows – Project Manager – WSP*

F.4. Road safety audit decision log

TABLE F.4. ROAD SAFETY AUDIT DECISION LOG

RSA Problem	RSA Recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA Action
Problem A **Location:** Link Road chainage 420 – 440 **Summary:** Surface water ponding At chainage 420 – 440 there will be a carriageway low spot. At this location, surface water may pond which could freeze in cold weather increasing the risk of vehicle skidding and loss of control in wet weather or icy conditions.	It is recommended to ensure there is appropriate drainage provided	Agree. The current drainage proposals adequately manage this risk. The drainage strategy is for a combined drainage kerb system with double outfall at the low point chainage 417 to mitigate any potential blockage risk. The detailed design will be developed and discussed with the Overseeing Organisation during the next phases of the project.	Details to provided at detailed design stage.	*Drainage details to be provided at detail design stage as per designer's response.*

RSA Problem	RSA Recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA Action
Problem B **Location:** Link Road chainage 280 - 320 **Summary:** Vertical alignment and adverse camber. The proposed vertical alignment of the Link Road between Ch280 and Ch320 shows provision of camber on the right-hand bend. With the combination of the adverse camber on the right-hand bend and narrow carriageway width of 6.5m, as per Departure from Standard WBLR/DfS08, northbound vehicles driving down a steep downhill gradient may accelerate and lose control on the bend. These manoeuvres may lead to vehicles encroaching onto the adjoining shared footway/cycleway in potential collisions with pedestrians/cyclists.	It is recommended to modify vertical and horizontal alignment to eliminate the adverse camber and widen the carriageway on the bend	Disagree. The raised junction table prior to the right turn bend will slow drivers on the approach. This is a low speed setting. The narrow carriageway and bend, with approach features (tables etc) will have the effect of lowering speeds which will reduce the likelihood of vehicles traveling at excessive speed. Widening the road will have the reverse impact of encouraging higher speeds. The existence of Ancient woodland either side of the alignment also prevents changes to the proposed alignment The previous DfS No.5 had been approved by WSCC for this section of the road. DfS 8 now covers DfS No. 5 and north side of the bridge. Warning signs to diag 512 'sharp bend ahead' will be provided on the approach to the bend.	*The provision of speed tables will encourage a reduction in speeds when heading southbound. Plan ref Phase 2 Horizontal alignment with no DFS has been produced to indicate the impact of removing the adverse camber. It confirms any realignment would have a significant impact on the ancient woodland protection zones.* *DfS will be resubmitted for approval and additional sharp bend warning signs provided.*	*DfS 8 submitted.* *Additional sharp bend warning signs to be provided as per the original approved DfS 5.*

Problem C **Location:** Traffic signal maintenance layby **Summary:** Traffic signal maintenance layby leading to restricted visibility. The proposed signal maintenance layby is positioned in the verge adjacent to the northbound carriageway at Ch90. At this location, a maintenance van will obstruct visibility out of the junction with the development access road No. 1. Restricted visibility will increase the risk of junction overshooting and T-bone type collisions with traffic on the Link Road.	It is recommended to relocate the layby out of the visibility splay	*Disagree* *The junction has been moved further from the layby as part of the move to a cross roads but it is not possible to completely move the layby out of the visibility splay area.* *The layby will be occupied very infrequently so the residual risk is minimal.* *Moving the junction further will impact on the bus stop visibility to the north which will be a much more frequent event.* *It is not possible to locate the layby anywhere else as the risks would be increased not reduced.* *The raised table and other features in the area will further reduce the risk of elevated speeds that could lead to a collision.* *No change is proposed.*	The layby will be used infrequently and needs to be provided within close proximity to the signalised crossing.	*No further action.*

Problem D **Location:** Proposed junctions **Summary:** Lack of space for larger vehicles Vehicles entering access road junctions may have difficulties due to the size of the junction. If there is insufficient space for these vehicles, particularly larger type vehicles, they may have to carry out inappropriate manoeuvres in conflict with street furniture or other vehicles.	It is recommended to ensure that sufficient space is provided for manoeuvring vehicles.	Disagree. Refer to the TN reference No. WBLR-CAP-HGN-04-AN-C-121 S3-P01 which sets out the vehicle tracking for the side roads with 8m and 6m radius. *'Modelling for 6m junction mouth radii indicates that a car would negotiate the access wholly within their traffic lane but a large van and a refuse vehicle would encroach into the opposing traffic lane while turning into the access. The extent of the encroachment implies that the larger vehicles would need to pause if another vehicle, of any size, is waiting to leave the access.'* It has been accepted by WSCC and MSDC to use the 6m radius as the tighter radii will help with reducing the speeds of vehicles and help protect the NMU users who have priority	The reduced radii are required to provide pedestrian and cyclist priority at the side roads and are inline with guidance provided in LTN 1/20	*No further action*

Problem E **Location:** Proposed junctions. (Access road No 1) **Summary:** Lack of visibility out of junction. The visibility splay out of the junction with the development access road No.1 to the north will be obstructed by the proposed bus stop and line of trees in the western verge. Limited visibility will increase the risk of junction overshooting and collisions with traffic on the Link Road.	It is recommended to ensure there is unobstructed visibility.	Disagree. The current design provides the required visibility for the environment. A tree species with a 2.5m clear trunk / high canopy will be specified to provide intervisibility underneath. The tree trunk will be behind the 43m visibility splay and clear of the bus stop-(recommended stopping sight distance in Manual for Streets for a 30mph speed limit).	Visibility to be provided in line with guidance for a 30mph road of 2.4m x 43m.	*Evidence of sightlines to be provided at detail design*
Problem F **Location:** Proposed junctions. (Access road No 2) **Summary:** Lack of visibility out of junction The visibility splay out of the junction with the development access road No.2 to the north will be obstructed by the proposed bus stop and line of trees in the western verge. Limited visibility will increase the risk of junction overshooting and collisions with traffic on the Link Road.	It is recommended to ensure there is unobstructed visibility	Disagree. The current design provides the required visibility for the environment. A tree species with a 2.5m clear trunk / high canopy will be specified to provide intervisibility underneath. The tree trunk will be behind the 43m visibility splay-(recommended stopping sight distance in Manual for Streets for a 30mph speed limit).	Visibility to be provided in line with guidance for a 30mph road of 2.4m x 43m.	*Evidence of sightlines to be provided at detail design*

Problem G **Location:** Proposed junctions. (Access road No 3) **Summary:** Lack of visibility out of junction. The visibility splay out of the junction with the development access road No.3 to the south will be obstructed by the proposed bus stop and line of trees in the western verge. Limited visibility will increase the risk of junction overshooting and collisions with traffic on the Link Road.	It is recommended to ensure there is unobstructed visibility.	Disagree. The current design provides the required visibility for the environment. A tree species with a 2.5m clear trunk / high canopy will be specified to provide intervisibility underneath. The tree trunk will be behind the 43m visibility splay and clear of the bus stop-(recommended stopping sight distance in Manual for Streets for a 30mph speed limit).	Visibility to be provided in line with guidance for a 30mph road of 2.4m x 43m.	*Evidence of sightlines to be provided at detail design*
Problem H **Location:** Proposed junctions. (Access road No 2) **Summary:** Crossroad junction type will increase the risk of vehicular collisions at the intersection The two proposed priority junctions to the development accesses No.1 and No.2 are positioned opposite each other forming a crossroad. A crossroad junction arrangement is known as the most unsafe form of an intersection, as vehicles may misjudge the priority and	It is recommended to modify these junctions creating a stagger.	Disagree. The access road No. 1 is for a public space and allotments, so traffic volumes will be light. The access road No. 2 is for housing development plot. As no through roads, the side roads will not be accessed by road users who are unfamiliar with the junction. The presence of the raised table will also highlight the junction.	*The traffic volumes on side road will be low due to the no through road nature and predominantly residential use.* *The provision of crossroads as opposed to a stagger improves pedestrian and cycling crossing opportunities at the raised tables.*	*No further action*

overshoot the main road with risk of T-bone type of collisions. This is particularly hazardous if these two junctions will lead to communal/shopping areas generating high traffic flows.		This is a low traffic road. The cross road is on a raised junction table to encourage slower speeds. Give lines are provided and this is a lit road. MSDC and WSCC have requested the cross roads as this layout is in line with the wider development.		
Problem I **Location:** Intersections between the proposed shared footway/cycleway. **Summary:** Vehicle/cyclist confusion At the intersections between the proposed shared footway/cycleway and side roads the priority is given to cyclists and pedestrians over motor vehicles at the humped crossing points. The position of give way markings prior to the humped crossing for vehicles accessing the side road junctions may lead to vehicles backing onto the main road while giving way to cyclists/pedestrians, with potential rear	It is recommended to remove the give way markings facing the traffic entering the side road junctions or set further back the crossing point to allow the space for at least one vehicle to wait at the crossing off the main road	Disagree The road markings follow the guidance in LTN 1/20 for a partial set back as per Figure 10.13. to give priority to the cyclist. Vehicle speeds have reduced as drivers go over the raised junction table. Setting the crossings back was proposed during the design phase but MSDC and WSCC have expressed a preference for the 'in line' layout. Current rules in the highway code give NMU's priority in this situation so drivers will become more	*Proposals are provided in line with LTN 1/20 guidance and provide priority to NMUs*	*Tactile paving to be in accordance with LTN 1/20*

end shunt collisions from vehicles on the Link Road. Also, two sets of side by side give way markings at the junction mouth are likely to create confusion for motorists entering the junction leading to inappropriate manoeuvres or sudden braking		used to giving way at side road junctions over time, further reducing the likelihood of rear end shunts. The raised tables will also assist with reducing traffic speeds in these areas.		
Problem J **Location:** ADS southbound approach to the roundabout. **Summary:** ADS restricting visibility to signal head and out of access. The proposed ADS on the southbound approach to the Phase 1a roundabout may restrict forward visibility towards the traffic signal heads of the proposed Pegasus crossing. Lack of forward visibility towards the signal heads may result in vehicles overshooting the crossing, increasing the risk of vehicle/pedestrian collisions on the crossing. Furthermore, the ADS may restrict visibility for vehicles exiting access road No 2 leading to vehicle collisions with through traffic.	It is recommended to ensure the ADS does not restrict visibility to the signal heads or restrict visibility for vehicles exiting the junction.	Agree. Location of ADS has been chosen to provide the required visibility.	*Forward visibility to be shown at detailed design.*	*Provide information at detail design stage*

Problem K **Location:** Pegasus crossing. **Summary:** Lack of lighting at the Pegasus crossing The proposed street lighting column at the Pegasus crossing is located approximately 10m east of the crossing. The column at this location may not provide appropriate lighting at the crossing increasing the risk of vehicle/pedestrian collisions at night or during poor weather conditions.	It is recommended to ensure there is appropriate lighting at the crossing.	Agree. The current design has been done to provide appropriate lighting levels through this area. At the crossing the LC height is 8m and the rest of the scheme is 6m. Lighting contour plans have now been developed and will be discussed and agreed with the Overseeing Organisation	Appropriate lighting to be provided at detailed design stage.	*Details to be provided at detail design stage*
Problem L **Location:** Bus stop locations. **Summary:** Lack of corduroy paving There is a lack of corduroy paving provided at the proposed bus stops to alert users they are entering shared use routes once they have alighted from a bus. This lack of information increases the risk of cyclist/pedestrian collisions particularly for users that are partially sighted	It is recommended to provide corduroy paving at bus stop/shared use intersections	Agree The drawing 0223 already indicates the grey coloured corduroy style tactile paving at the interface of the bus stop and shared use. No additional paving is required.	Provide corduroy paving at bus stop/shared use interface.	*Corduroy paving to be provided at bus stop/shared use interface as per drawing 0223.*

F.5. Design organisation and Overseeing Organisation statements

Include the following statements to be signed by the Design Team and the Overseeing Organisation.

TABLE F.5. DESIGN ORGANISATION STATEMENT

On behalf of the design organisation, I certify that: 1) the RSA actions identified in the response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation.	
Name:	**Kim Still**
Signed:	
Position:	**Associate Engineer**
Organisation:	**WSP**
Date:	**14.12.2023**

TABLE F.6. OVERSEEING ORGANISATION STATEMENT

On behalf of Overseeing Organisation, I certify that: 1) the RSA actions identified in the response to the road safety audit problems in this road safety audit have been discussed and agreed with the design organisation; and 2) the agreed RSA action will be progressed.	
Name:	**Stephen Gee**
Signed:	
Position:	**Principal Transport Planner**
Organisation:	**West Sussex County Council**
Date:	**20/12/2023**