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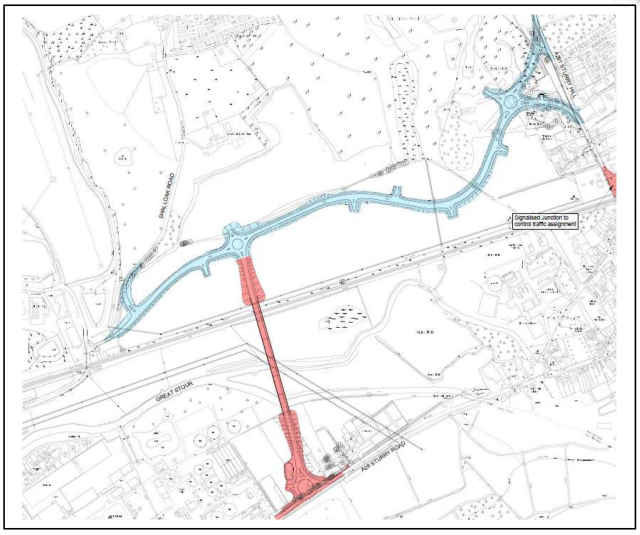

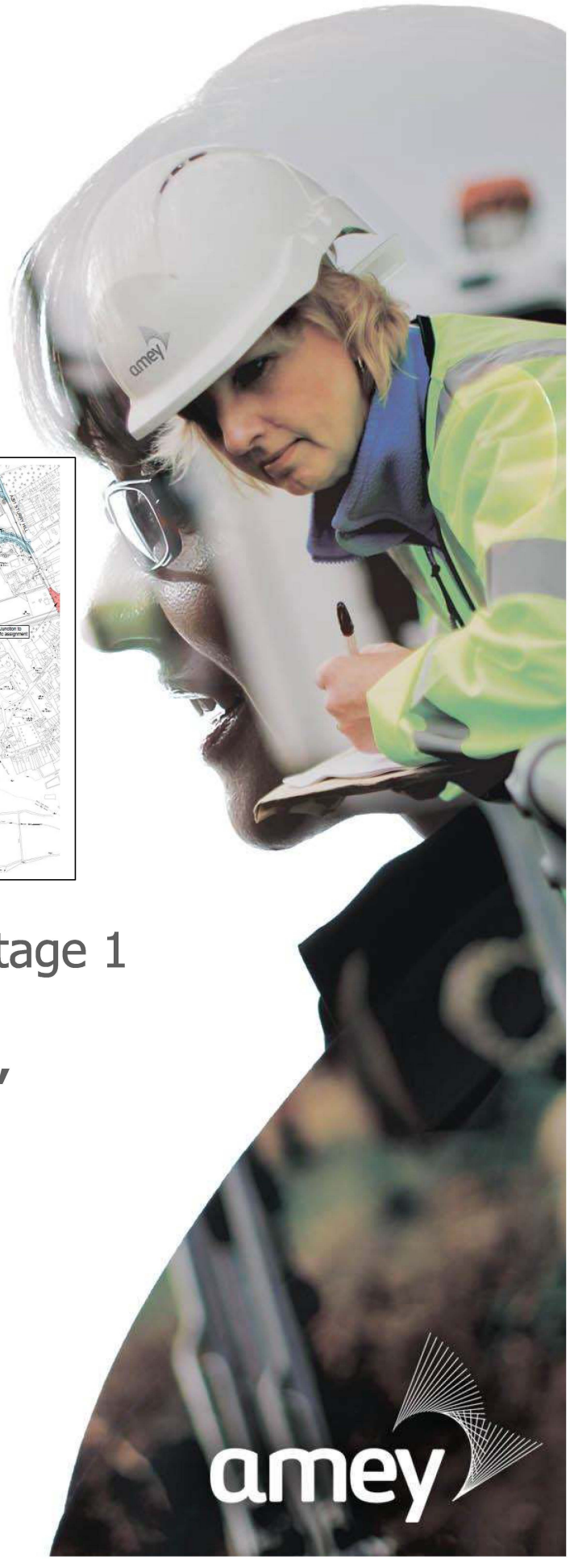

Road Safety Audit Stage 1 Response Report

A28 Sturry Link Road, Canterbury

CO04300392/006 Revision 1

December 2017

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Document Control Sheet

Project Name:	A28 Sturry Link Road, Canterbury
Project Number:	CO04300656
Report Title:	Road Safety Audit Stage 1 Response Report
Report Number:	CO04300392/006

Issue Status/Amendment	Prepared	Reviewed	Approved
Initial Issue DRAFT (for comment by Scheme Promoter)	Name: [redacted] Signature: [redacted] Date: 18/12/2017	Name: [redacted] Signature: By Email Date: 20/12/2017	Name: [redacted] (As Project PM) Signature: [redacted] Date: 20/12/2017
Final Issue (Rev 1)	Name: [redacted] Signature: [redacted] Date: 22/12/2017	Name: Signature: n/a Date:	Name: [redacted] Signature: [redacted] Date: 22/12/2017
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1 Introduction

1.1 This report provides the Design Team Project Manager's response and the Scheme Promoter's decision on the safety related issues raised in the Stage 1 Road Safety Audit report carried out for the A28 Sturry Link Road, Canterbury scheme (Ref: CO04300392/RSAStg1 Revision Final). The Stage 1 Road Safety Audit Brief comprised of a set of drawings, documents and supporting information assembled by the Design Team Project Manager (Michael Mortley) and sent to the Road Safety Audit Team for examination.

1.2 The audit was carried out during November 2017 and the Road Safety Audit Report was prepared and issued by the approved Kent County Council Road Safety Audit Team Leader, Nick Newton of Amey. The Audit Team has not been involved with any aspect of the design development at any stage.

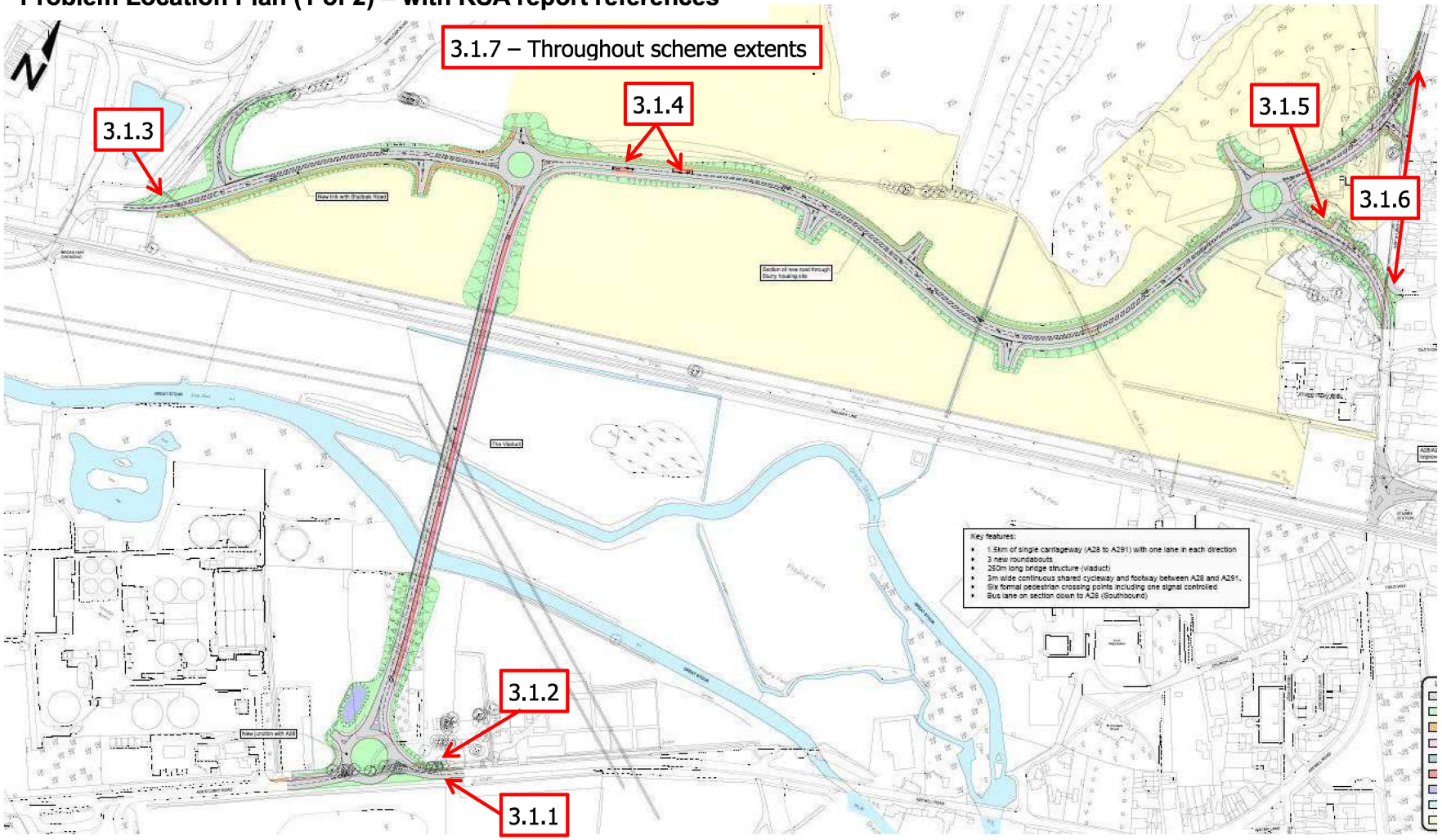
1.3 The proposed scheme forms part of a major new piece of transport infrastructure to support future mixed developments in the area and help to reduce congestion through the village of Sturry. The new link road will become the main local distributor road in the area (i.e. the new A28) connecting the A291 Sturry Hill in the north to the A28 Sturry Road in the south. Major improvements to the existing A28/A291 junction are also required as part of the proposals and have been examined as part of this audit.

1.4 This report includes, in tabular form:

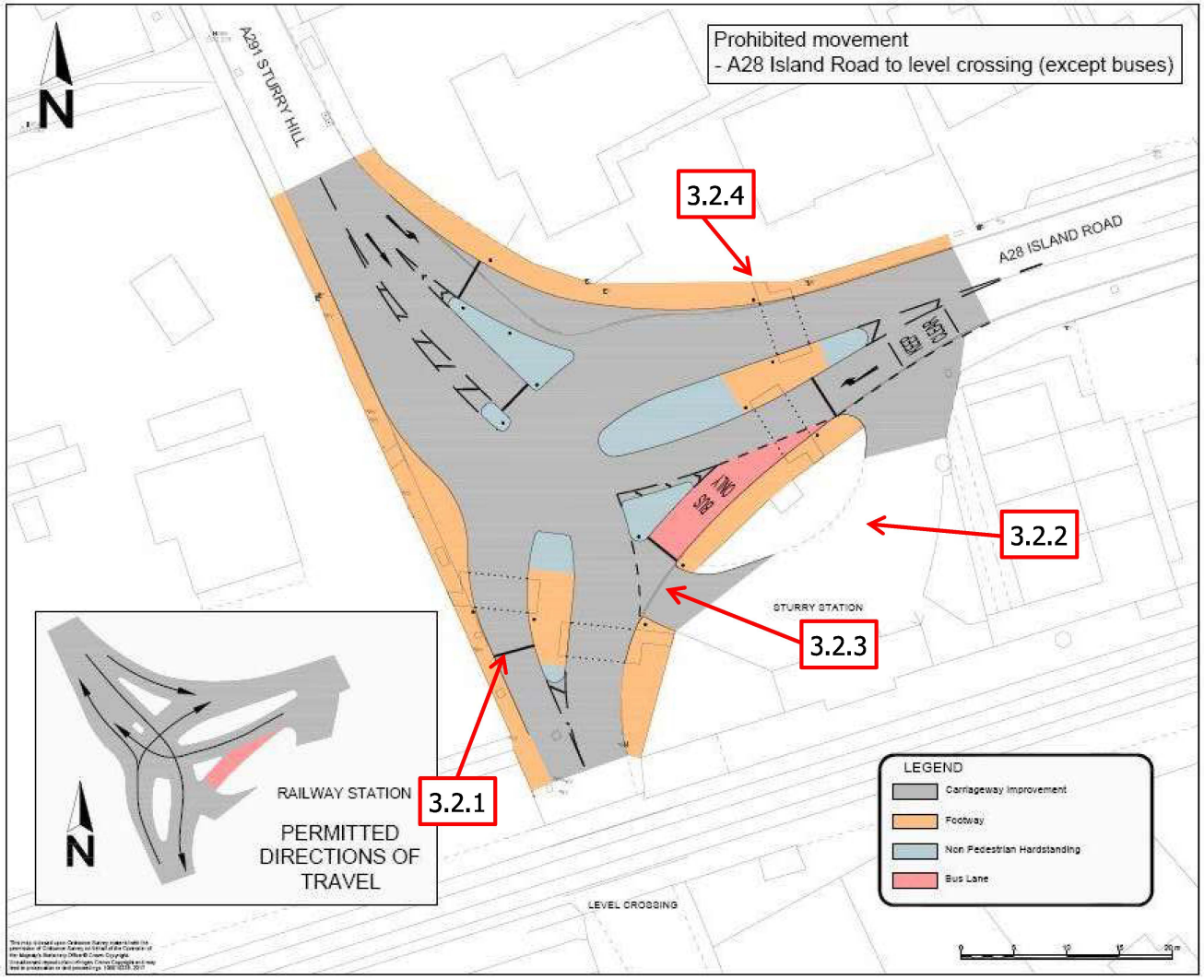
- A summary of the problems and recommendations raised by the audit team;
- The Design Team Project Manager's response to the issues and recommendations raised; and
- The Scheme Promoter's decision and proposed action.

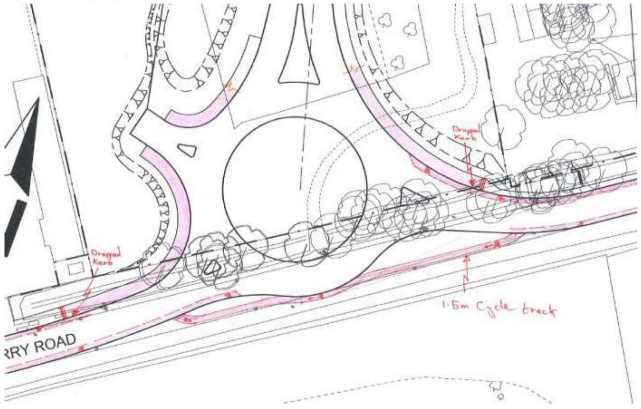
1.5 A copy of an Email from the scheme's promoter confirming the promoter's decisions is appended to this report.

Problem Location Plan (1 of 2) – with RSA report references



Problem Location Plan (2 of 2) – with RSA report references



Item No.	Issues Identified and Their Recommendations	Design Project Manager's Response	Scheme Promoter's Decision And Proposed Action (as provided and approved by KCC)
3.1.1	**PROBLEM** **Locations**: New Junction with A28 **Summary**: The A28 Sturry Road has dedicated cycle lanes on both westbound and eastbound at the location where the new roundabout is proposed. Under the proposed arrangement cyclists traveling on the westbound would need to enter the roundabout in order to continue ahead on A28 westbound. Cyclists are a vulnerable road user and they should be kept where possible out of the circulatory carriageway where they are potentially exposed to vehicle strikes. **RECOMMENDATION** Cyclists traveling on the A28 Sturry Road westbound should be provided with safe facilities to continue ahead and re-join the cycle lane.	**Comment:-** We accept the auditor's recommendation. A proposal to provide an off carriageway route for A28 westbound cyclists is shown below. This includes a 1.5m one-way cycle track skirting the southern side of the roundabout designed to minimise its impact on the existing southern verge and associated trees/vegetation. It should be noted that advisory cycle lanes are shown to commence immediately at the roundabout exit points. This will alert drivers to the potential presence of cyclists as they leave the roundabout, encouraging drivers to align themselves slightly away from the kerb, thereby making it safer for cyclists when entering the cycle lanes from the footways/cycle track. They also provide for a safer exit for those cyclists who choose to cycle on the roundabout.  **Recommended Action:-** As described above	The designer's recommendation is accepted **Proposed Action:-** To be incorporated into the design, may need to be developed to provide crossing points.

Item No.	Issues Identified and Their Recommendations	Design Project Manager's Response	Scheme Promoter's Decision And Proposed Action (as provided and approved by KCC)
3.1.2	**PROBLEM** **Locations**: New Junction with A28 **Summary**: Insufficient facilities for cyclist could result in vehicle / cyclist conflicts. From the drawings provided it appears that cyclists travelling either from A28 Sturry Road or form the New Link Road towards A28 Mill Road would need to re-join the carriageway in the proximity of the new roundabout exit. It is not clear at this stage how the existing cycle lane would be connected with the proposed shared footway. Motorists tend to accelerate when exiting the roundabout and could not expect cyclist to re-join the carriageway resulting in potential vehicle /cyclist conflicts. **RECOMMENDATION:** The shared footway should be extended to allow cyclists to join the carriageway further from the roundabout exit. The footway prior to the transition to the cycle lane should be segregated to avoid potential cyclist / pedestrian conflicts.	**Comment:-** The recommendation under 3.1.1 is considered to adequately address the concerns of potential vehicle/cyclist conflict at the exits as explained above. By extending the shared footway further downstream of the roundabout exit cyclists will be joining the carriageway at locations where traffic speeds would be higher than at the roundabout exit, placing cyclists at greater risk as a result. This is not therefore preferred. Where cyclists are invited to leave the carriageway on approach to the roundabout a short length of segregated footway as they exit is considered beneficial (i.e. on eastbound approach). This avoids the potential for cyclist to stop on carriageway should a pedestrian be present on the footway at the point of entry. These arrangements can however be complicated requiring much street furniture (i.e. tactile paving/signs). For that reason it is considered unnecessary to provide a similar arrangement where cyclists are entering the carriageway as the safety risk is considered much less and tolerable **Recommended Action**:- As 3.1.1 and in addition provide a short segregated section of footway onto which cyclists can enter when exiting the carriageway. The latter can be incorporated during the detail design stage.	The designer's recommendation is accepted **Proposed Action:-** To be incorporated into the design, may need to be developed to provide crossing points.

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3.1.3	**PROBLEM** **Location**: Western footway termination. **Summary**: The audit team is aware that the drawings are only indicative at this stage however it appears that the new link road footway terminates on the most western point is leading to the carriageway. There is no footway on the opposite carriageway and visually impaired pedestrians could cross the road at a place where there is no corresponding footway at this location. Pedestrians may become 'stranded' in the carriageway where they would be vulnerable to vehicle strikes. **RECOMMENDATION** The footway arrangement should not lead into the carriageway at this location	**Comment:-** It is reasonable to expect that pedestrians with a visual impairment would already be aware of the road layout and facilities available to them prior to their journey. The occurrence of a visually impaired person being on their own crossing for the first time would be extremely unlikely. There is therefore considered to be no safety risk through unawareness of a footway on the north side. The design at this point is however subject to change as full details of the adjacent development proposals remain uncertain. **Recommended Action:** – None at this stage, but to be reviewed once full details of the adjacent development have been established.	The designer's recommendation is accepted **Proposed Action:-** To be reviewed as part of the detailed design including any provision for tactile paving.
3.1.4	**PROBLEM** **Location**: A291 Sturry Hill Road **Summary**: Vehicles traveling on the eastbound of the proposed link road could potentially overtake stationary busses. Shortly after the bus stop there is a proposed un-controlled crossing location and overtaking vehicles are expected to accelerate in order to undertake this manoeuvre. In addition, motorists are expected to be more focused at the	**Comment:-** Drivers overtaking a stationary bus will be fully aware that they are approaching a roundabout and as such would have to regulate their speed in order to safely negotiate the roundabout (i.e. expect to give-way and negotiate 'tight' geometry – deflection). With the pedestrian crossing located on the immediate entry to the roundabout it is considered that there is therefore no additional risk to pedestrians from the siting of the bus	The designer's recommendation is accepted **Proposed Action:-** To be reviewed as part of the detailed design and in consultation with the bus companies

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	oncoming traffic and there is the risk to not observe a pedestrian crossing the carriageway. This could result in potential vehicle-NMU conflicts or lead to sudden breaking which could result to nose to tail shunt collisions if the overtaking vehicle is followed by another vehicle. Furthermore, vehicles exiting the roundabout towards eastbound are expected to accelerate and there is the risk for head-on collisions with vehicles travelling on the westbound overtaking stationary busses. **RECOMMENDATION** Both bus stops should be relocated on the opposite side of the carriageway	stop. The location of the bus stop is approximately 60m from the pedestrian crossing point and as such pedestrians waiting to cross will have good time to appreciate the presence of any vehicle overtaking stationary buses and react accordingly. The orientation of the bus stops has initially been designed to discourage unsafe overtaking manoeuvres in the event that buses are stationary in both bus stops at the same time. If sited in the opposite sense, stationary buses would obscure visibility to on-coming traffic and some drivers may take the risk of overtaking 'blindly'. Additionally, the proposed location of the eastbound bus stop will reduce the potential for queues to back up onto the roundabout. Their final location may however be subject to other matters and will be reviewed following full consultation with the bus companies. **Recommended Action:-** None at this stage but should be reviewed following full consultation with the bus companies.	
3.1.5	**PROBLEM** **Locations**: New Link with A291 (Road 11) junction **Summary**: The proposed junction serving the housing estate from Road 11 is located after a bend. Vehicles traveling from on the A291 northbound towards the new link road may not observe in time stationary vehicles waiting to turn right into the housing estate due to the road horizontal alignment	**Comment:-** The design is considered to provide adequate forward visibility to this junction (70m), compliant with the Kent Design Guide standards for this type of road (i.e. Local Distributor). The road will be subject to a 30mph speed limit and is also on a steep uphill gradient. We do not therefore have	Noted **Proposed Action:-** The location of the junction could be accepted however the position of the junction to be reviewed as part of the development master planning

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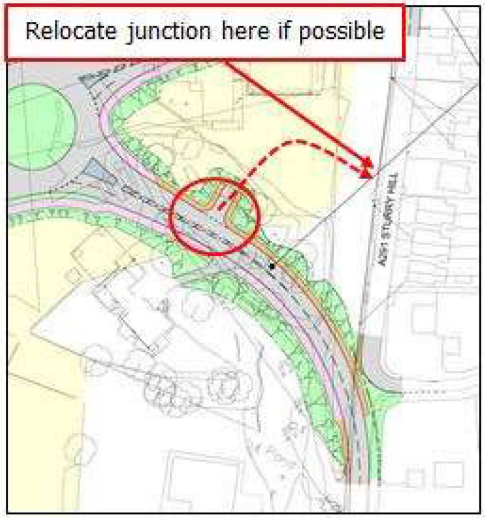
	which consists of a bend increasing the risk for potential nose to tail shunt collisions. In addition, under the proposed changes to the Railway Station junction, traffic travelling from A28 Island Road will be permitted to only turn right. Motorists wanting to go towards A28 Mill Road will have to use the new east roundabout to do a U-turn and there is the potential to travel at a higher speed in order to compensate for the lost time by not being able to initially turn left at the junction. This would increase the potential for nose to tail collisions with vehicles waiting to turn right into the housing estate on the New Link with A291. **RECOMMENDATION** The junction should be relocated to the North East of the housing estate from A291 Sturry Hill if possible. (Figure 5)	any safety concerns regarding the current location of this junction. The recommendation to relocate the junction as indicated below will however be beneficial from a road safety point of view as it would reduce the number of junctions on the main roads, which is desirable.  This is however a matter for the developers. **Recommended Action:-** None, at this stage.	
3.1.6	**PROBLEM**		

Item No.	Issues Identified and Their Recommendations	Design Project Manager's Response	Scheme Promoter's Decision And Proposed Action (as provided and approved by KCC)
	Locations: A291 Sturry Hill Road **Summary**: Potential 'see through' on A291 Sturry Hill could lead to potential loss of control or nose to tail shunt collisions. The proposed works show that two new link roads from A291 are going to be constructed and the existing road between these new link roads is to be separated but retained. Under this arrangement there is the risk for motorists to misjudge the new road alignment and believe that the road continues ahead which can potential result in various types of collisions such as loss of control or nose to tail shunts. **RECOMMENDATION** Measures should be implemented to provide a clear separation between the new road alignment and the retained section of road such us: • Vegetation on the side of the road to enhance the new alignment and to block the view towards the retained road. • Signing • Reflective marker posts	**Comment:-** Agreed. This can be addressed as part of the detailed design **Recommended Action:-** None at this stage but measures to provide a clear separation or screening between new and existing alignments should be identified and incorporated in the scheme during the detailed design stage.	The designer's recommendation is accepted **Proposed Action:-** To be incorporated into the detailed design.
3.1.7	**PROBLEM** **Location**: Throughout the scheme extents **Summary**: The proposed footways throughout the whole scheme extents are located adjacent to embankments and except the viaduct no other	**Comment:-** To the north of the railway the embankments will be a temporary measure until such time as the housing development is fully established (i.e. properties/gardens etc. will be built over the embankments to tie up with	noted **Proposed Action:-** This should be assessed in accordance with any profiling of

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	restraint systems are proposed. As no details, have yet been provided detailing what pedestrian restraint measure if any are to be included. With no protection for NMU's adjacent to embankments there is the risk to slip/ trip and falls down the embankment for pedestrians and also cyclist losing control of their bicycle could also fall into the embankments with risk of injuries. **RECOMMENDATION** Suitable restraint systems for the types of NMU's likely to use that specific footway should be installed adjacent to the embankments.	levels to the road). The need for restraint systems, if any, should therefore be reviewed as part of ongoing construction phases for the development. That said, embankment slopes will be at a relatively shallow angle (1 in 2.5 slope profile), lessening the likelihood of any injury from a pedestrians/cyclists falling/entering onto the embankment slope. To the south of the railway the embankment will be a permanent feature and protection measures may be desirable, particularly as there is a risk of flood water being present at the bottom of the embankment. Again, the slope to the embankment will be at a shallow 1 in 2.5 profile, lessening the likelihood of injury should a pedestrians/cyclists fall/enter onto the embankment slope. **Recommended Action:-** None at this stage, but reviewed as part of the detailed design and as and when construction phasing is confirmed.	the adjacent development site and subject to a risk assessment and reconsidered as part of the detailed design.
3.2.1	**PROBLEM** **Location:** Traffic signals adjacent to the level crossing **Summary**: In the event where a vehicle does not manage to clear the box junction due to vehicles in front stopping at the red signal, there is the risk for the level crossing barriers to be lowered and the vehicle to be trapped risking to be struck by the	**Comment:-** The possibility of a vehicle becoming stationary on the level crossing as a result of traffic signals at the junction is recognised and agreement has been reached to relocate the stop line to the south of the level crossing. **Recommended Action:-** As noted above.	In discussion with the Traffic System asset manager this has been accepted **Proposed Action:-** Revised positioning of the stop line to be incorporated into the

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	oncoming train. The audit brief mentions that that Network Rail have no concerns regarding the installation of the signals providing that the signals can be integrated with the level crossing signals, but as no details are ready at this stage regarding how the integration would be achieved, this is still raised as a problem. **RECOMMENDATION** The junction signals and the level crossing signals (Wig-Wags) should be integrated ensuring that there would be no stationary traffic within the box junction when the level crossing needs to operate. Full details regarding the staging and phasing of the integrated traffic signals should be prepared for the stage 2 RSA.		final design.
3.2.2	**PROBLEM** **Location:** Sturry Railway Station **Summary**: The Sturry Railway Station pick-up/drop-off area could be abused as a rat-run by vehicles traveling towards Mill Road from Island Road The improvements on this junction aim to direct traffic from A28 Island Road towards the new link road by closing the left turn. However, motorists with the intention to travel towards Fordwich Road or in the close proximity of Mill Road would find it inconvenient to use new link roads or even U-turn at the proposed East Roundabout as it would add extra time to their journey	**Comment:-** This issue was recognised during development of the design option and the intention of the design is to permit entry only to the station forecourt at its western access by traffic from Sturry Hill only. The layout of the west access has been designed to discourage misuse (i.e. no left radius on exit) in addition to installing no-entry signs viewed from the forecourt. As suggested by the auditor, further discouragement could be achieved through careful design of the internal arrangement of the forecourt. Ultimately, it can be expected that the most determined of drivers will abuse	The designer's recommendation is noted. **Proposed Action:-** Layout of the forecourt to be considered as part of the detailed design of the junction

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	The drop-off / pick-up area could be abused my motorists as a rat-run who may by-pass the bus only area and continue their journey turning left towards the level crossing. This could cause inconvenience to motorists genuinely wanting to use the drop-off / pick-up are leading to potentially frustration and aggressive driving which may also result in side swipe collisions. **RECOMMENDATION** The car park drop of area should be reconfigured or a form of barrier control should be used.	the layout, just as some will no doubt use the bus lane for access. The suggestion for a form of barrier control is unlikely to be workable as it would impact on the junction operation and probably become unreliable. There is the option to close the access and allow access to the forecourt only from the east side. However, this is not preferred as it will lead to vehicles impeding the flow of traffic through the junction from Sturry Hill. **Recommended Action:-** Investigate how the station forecourt could be reconfigured to further discourage misuse by drivers. If, after monitoring the situation following completion of junction improvement works it becomes too hazardous, then consideration should be given to closing the west access, albeit with some detriment to junction performance.	
3.2.3	**PROBLEM** **Location:** Sturry Railway Station **Summary**: Vehicles exiting the Sturry Railway Station could attempt to drive north towards A291 Sturry Hill Road with risk for side swipes and side impact collisions. Under the existing arrangement vehicles exiting the station can access all three junction arms as it can be seen on Figure 9, but with the proposed arrangement they can only exit left towards the level	**Comment:-** I believe the concern here is whether drivers will inadvertently assume they can proceed northbound from the exit. Given that there will be 'No-Entry' signs at the exit, that drivers using the forecourt could be expected to be frequent users fully aware of the restriction and that the route needed to undertake this manoeuvre would be seen as quite sinuous, the likelihood of it happening would be very low. **Recommended Action:-**	The designer's recommendation is noted. **Proposed Action:-** Layout of the forecourt to be considered as part of the detailed design of the junction

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	crossing. As it can be seen from Figure 10 motorist could still undertake the ahead and right manoeuvre, even though the central refuge on the A291 south arm has been extended. If vehicles will exit the station towards A28 Island or A291 north there is the risk for side swipe and side impact collisions as vehicles travelling through the signalled controlled arms, would not expect such manoeuvres. **RECOMMENDATION** Motorists exiting the railway station should only be permitted to exit left and appropriate signage should be installed to enforce it. Swept path analysis should be undertaken and if possible, the central refuge island on the A291 south arm should be extended towards north to minimise the potential for vehicles to attempt to go ahead or turn right from the station.	As above	
3.2.4	**PROBLEM** **Location**: A28 Island Road signalled crossing **Summary**: The access to the CO-OP car parking is used as booth entry and exit as it is wide and also the exit point is sometimes inaccessible due to abuse of the boxed junction (see in Figure 12). Due to the proposed location of the signalled crossing the width of the access would be reduced and insufficient to be used for both entry and exit. In addition, pedestrians waiting at to cross at this location could be exposed and if a driver error	**Comment:-** The existing access arrangement is shown below with the exit arrow indicating to drivers to turn left onto the carriageway, and not through the Coop forecourt as intimated by the auditor. This arrangement cannot be changed however it is considered that a slight reduction in width of the access can be tolerated, particularly given that a parked vehicle in the disabled bay (located just above the left turn arrow) will naturally steer drivers away from the right side of the access as they exit.	The designer's recommendation is noted. **Proposed Action:-** This is to be considered in more detail prior to submission of the planning application

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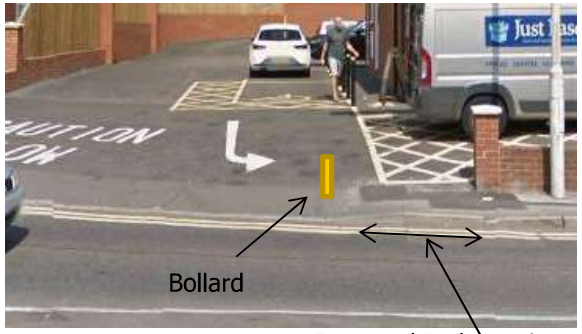
	occurs and the motorist exiting the car park would drive straight towards the crossing, the pedestrians would be unaware of this and unable to attempt to avoid it. **RECOMMENDATION** A suitable vehicle restraint system to protect pedestrians waiting to cross should be installed. Also, the car parking layout should be modified to entry only and exit only. It should be signed accordingly and road markings installed to guide motorists in and out of the car park.	 The exact location of the crossing will be subject to detailed design however a small shift of the crossing to the right, as viewed below, would be possible. Nevertheless, a strategically placed bollard could be installed as shown below to protect the crossing point without any real hindrance to the access.  **Recommended Action:-** As explained above.	

Email confirmation by Promoter

From: Richard.Shelton@kent.gov.uk
To: Mortley, Michael
Cc:
Subject: RSA1 Audit Response Report - Client response 22-12-17
Sent: Fri 22/12/2017 10:38
Message | RSA1 Audit Response Report - Client response 22-12-17.docx

Mick,

I have updated by comment for 3.2.3 and 3.2.2

Richard