



Stockton-on-Tees

BOROUGH COUNCIL

DEVELOPMENT & NEIGHBOURHOOD SERVICES

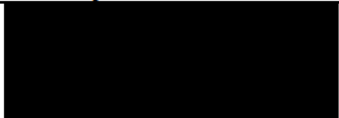

Technical Services


MOUNT LEVEN ROUNDABOUT

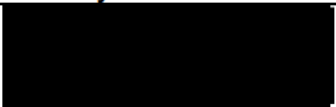

ROAD SAFETY AUDIT STAGE 2

REPORT



Date	11-11-14	
Draft RSA Report	Prepared by Team Leader	Checked by Team Member
Name	Anthony Wilton	Jonathan Kibble
Signature		

Date	12-11-14
Designer Comments	Prepared by Scheme Designer
Name	Tom Eggleston
Signature	

Date	12-12-14	
RSA Additional Comments	Prepared by Team Leader	Checked by Team Member
Name	Anthony Wilton	Jonathan Kibble
Signature		

Date		
Final RSA Report	Prepared by Team Leader	Approved by Traffic & Network Safety Manager
Name	Anthony Wilton	Joanne Roberts
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1 Introduction

- 1.1 This report details the results of a Stage 2 Road Safety Audit of Mount Leven Roundabout.
- 1.2 The audit has been undertaken in accordance with Stockton-on-Tees Borough Council's Road Safety Audit Procedure.
- 1.3 The audit team consisted of Mr A Wilton, Principal Engineer, Mr J Kibble Principal Engineer who undertook a day audit on Tuesday 11th November 2014. Weather conditions on site were overcast whilst the road surface was wet.
- 1.4 A list of information provided to the audit team has been provided as appendix A to this report.
- 1.5 A Stage 1/2 Road Safety Audit was conducted on this scheme in July 2014.
- 1.6 Road Safety Audit is based upon a qualitative risk assessment process and there is no measure of the success achieved by any recommendations. Road Safety Audit cannot guarantee the safe operation of the scheme under consideration in this report as accidents are rare and random events and are largely caused by factors outside the Audit Team's influence, such as driving behaviour and to a lesser extent vehicle condition.
- 1.7 The Following information was not made available to the audit team and as such any specific influence of these details on road user safety has not been considered by this audit:
 - Site Clearance
 - Auto tracking
- 1.8 Departure from standard horizontal approach curvature is 2 steps below the desirable minimum

2 Site Description

- 2.1 The development site is located on the north side of the A1044 Leven Bank Road (adjacent to the access road to Mount Leven). The A1044 Leven Bank Road is a principal road broadly oriented east to west. The section of A1044 Leven Bank Road adjacent to the site is subject to a 40mph speed limit.



- 2.2 The A1044 Leven Bank Road is a single carriageway providing a link between Ingleby Barwick and Yarm. The A1044 is used by the Highways Agency as a tactical diversion route (TDR) for the A19 northbound and occasionally southbound. In the last twelve months the A1044 has been utilised approximately 24 times as a TDR, although the majority of these occasions have been overnight closures for maintenance work. The existing carriageway is approximately 6.7m to 7.2m wide and is predominately rural bounded on both sides by grass verge, and is unlit.
- 2.3 A speed survey undertaken in May 2013 indicated an 85th percentile speed of 40.5mph in both directions. The available traffic data for the A1044 Leven Bank Road was provided from a survey in April 2012. The peak two way traffic volumes was approximately 1400 and 1300 vehicles during the morning and evening peak hours respectively.





3 Scheme Description

- 3.1 The scheme comprises of the development of 350 Continuing Care Retirement Community units and 100 bed nursing home which will be accessed off the A1044 Leven Bank Road via a new roundabout.

4 Items raised at Stage 1/2 Road Safety Audit

- 4.1 **Summary:** Pedestrians could trip and fall or be struck by vehicles.

Recommendation: Install dropped kerbs and tactile paving at the junction. Either fully inset the crossing point or convert the splitter island to a refuge with appropriate tactile paving.

Exceptions Report: Accepted – dropped crossings to be included at detailed design stage.

Further Comment: No longer considered a problem.

- 4.2 **Summary:** A number of collision types could occur.

Recommendation: Install advance direction signs on the approaches and direction signs on the splitter islands. Include any symbols required for the TDR

Exceptions Report: Rejected. Advanced directional signs are not required at this location since it's a minor junction.

Further Comment: No further comment.

- 4.3 **Summary:** Head on collisions could occur and pedestrians could be struck by vehicles.

Recommendation: Provide bollards on the island noses incorporating 'keep left' aspects to Diagram 610.

Exceptions Report: Accepted – bollards and signage to be provided at detailed design stage.

Further Comment: No longer considered a problem.

- 4.4 **Summary:** A number of collision types could occur.

Recommendation: Provide hatched markings in advance of the splitter islands.

Exceptions Report: Accepted – markings to be provided at detailed design stage.

Further Comment: Still considered a problem the proposed road markings and signing drawing (TS10028-1200-001) do not show hatching in advance of both splitter on the approaches on the A1044 Leven Bank Road. See Problem 5.1.

4.5 **Summary:** Loss of control collisions could occur.

Recommendation: Provide signs to Diagrams 515 and 606 on the central island to face motorists on the 3 approaches.

Exceptions Report: Accepted – road signs to be provided at detailed design stage.

Further Comment: No longer considered a problem.

4.6 **Summary:** A number of collision types could occur.

Recommendation: Ensure that the countdown markers and 250 yard warning sign and plate are correctly positioned on the detailed design drawings.

Exceptions Report: Accepted – The signs will be positioned as close as is practicable to the location required by the plate. Due to various verge width constraints on the approaches, some sign locations may need to be altered in accordance with TSRGD.

Further Comment: No longer considered a problem.

4.7 **Summary:** Cyclists could fall or be struck by vehicles.

Recommendation: Provide dropped kerbs and appropriate road markings where the cycleway joins the main carriageway.

Exceptions Report: Accepted – appropriate facilities for cyclists to be provided at detailed design stage.

Further Comment: No longer considered a problem.

4.8 **Summary:** A number of collision types could occur.

Recommendation: Two alternative recommendations are made as follows: -

1. If the development is subject to a 20mph speed limit, erect signs to Diagram 670 (20/30) back to back at the junction. In addition, if speeds are controlled by the use of vertical traffic calming features, erect a sign to Diagram 557.1 to warn of the presence of the features;

2. If the development is subject to 20mph zone control, erect signs to Diagrams 674 and 675 back-to-back at the junctions. Zone control will obviate the need for a sign warning of the vertical features.

Exceptions Report: Accepted – appropriate speed restriction signage to be provided at detailed design stage.

Further Comment: Still considered a problem see problem 5.2.

4.9 **Summary:** Loss of control collisions could occur.

Recommendation: Ensure that the interfaces between the existing and new surfaces are structurally secure, clean and sound. In addition, provide a wearing course on the new sections of carriageway with a similar PSV value to the existing.

Exceptions Report: Accepted – existing highway to be resurfaced to the extents of the site boundary

Further Comment: No longer considered a problem.

5 Stage 2 Road Safety Audit

General

5.1 **Problem**

Location: A1044 Leven Bank Road (both approaches to the roundabout).

Summary: Lack of hatching on the approach to the splitter islands may lead to an increased risk of collisions.

Description: The proposals do not show any hatching on the approach to either of the splitter islands on the A1044 Leven Bank Road. Hatched marking improve visibility of the splitter islands. The lack of hatching may increase the risk of collisions occurring.

Recommendation: Provide hatching on the approach to both splitter islands on the A1044 Leven Bank Road.

Designers Response: Accepted – hatching to diagram 1040.4 to be added.

Additional Comments: No longer considered a problem.



5.2 Problem

Location: Access road to retirement village.

Summary: Location of the speed limit transition may increase the risk of pedestrian/vehicular conflict.

Description: The transition from 40mph to 30mph on the access road is northeast of the uncontrolled crossing point. This may result in higher vehicle approach speed to the uncontrolled crossing point, thus increasing the risk of collisions occurring.

Recommendation: Relocate the speed limit transition south west of the uncontrolled crossing point on the access road.

Designers Response: Rejected – due to the geometry of the approach vehicle speeds will be low. Relocating the signs to the south west of the existing crossing may result in the sign faces blocking drivers line of sight to pedestrians waiting to cross.

Additional Comments: No further comment.

Traffic & Network Safety Managers Comments: Sign will provide 'gateway' information accept speeds will be low therefore recommendation not supported.

5.3 Problem

Location: General.

Summary: Obstructed warning signs may lead to an increase in the risk of collisions occurring.

Description: Location of several warning signs maybe obstructed by overgrown trees/shrubs. There is potential for drivers to miss these signs which could result in late decision making thus increasing the risk of collisions occurring.

Recommendation: Ensure all signs are clearly visible and annual maintenance of the trees/shrubs is undertaken.

Designers Response: Accepted – note to be added to drawing TS10028-1200-001 and also a clause added into contract.

Additional Comments: No longer considered a problem.



5.4 Problem

Location: General.

Summary: Increased risk of collisions due to several lighting columns/traffic signs located too close to the carriageway.

Description: Several traffic signs and street lighting columns are located too close to edge of the carriageway. There is an increased risk of passing vehicles striking the sign/lighting column thus increasing the risk of loss of control type collisions.

Recommendation: Ensure all traffic signs and street lighting columns are erected a sufficient distance from the edge of the carriageway.

Designers Response: Rejected – Lack of verge space at some column locations has resulted in some columns being unable to be sited with a sufficient set back distance. Columns which do not meet the minimum setback as stipulated in BS5489-1 are LC3, LC6, LC7, LC14. It is proposed that these columns are made passively safe, ensuring that they are HE classification to mitigate against secondary accidents.

Additional Comments: No longer considered a problem.

5.5 Problem

Location: General.

Summary: Obstructed warning signs may lead to an increase in the risk of collisions occurring.

Description: Several signs may be obstructed by proposed street lighting columns. There is potential for drivers to miss these signs which could result in late decision making thus increasing the risk of collisions occurring.

Recommendation: Ensure all signs are clearly visible.

Designers Response: Accepted – It is not possible to mount signs on the lighting columns due to their size and verge width is very constrained in some places. The placement of signs will be checked and rationalised during construction on site to ensure that they are clearly visible. Auditors comments are to be sought on site as to the appropriate placement of signs.

Additional Comments: No longer considered a problem.

5.6 Problem

Location: Leven Bank Road.

Summary: Proposed layout of roundabout may increase the risk of collisions for powered two wheel (PTW) vehicles.

Description: The proposals show a 15mm kerb between the circulatory carriageway and overrun area. Riders may not appreciate the change in levels especially during the hours of darkness and there is concern that a PTW vehicle may lose control whilst travelling across the kerb, thus increasing the risk of loss of control type collisions of PTW road users.

Recommendation: Remove the change in level between the overrun and circulatory carriageway.

Designers Response: Rejected - The 15mm upstand is in accordance with the maximum recommendations stated in "*TAL 12-93 - Overrun Areas*" and ensures that adequate deflection is achieved as vehicles pass through the roundabout. The roundabout is proposed to be well lit and the contrasting colour of the overrun area will help to highlight the change in level. Note will be added to kerbing drawings TS10028-1100-001 and 002 to ensure that kerbing with a 16-19mm bullnose is specified in accordance with TAL 12-93

Additional Comments: Still considered a problem. The roundabout will be located in a semi-rural environment. Therefore there is likely to be significant leaf foliage on the circulatory carriageway during autumn/winter thus reducing the rider's visibility of the kerb. Riders that cross this kerb at an angle are likely to lose control. Suggest removing the change in levels and kerb, maintaining the contrasting colours and hatch the overrun area.

Traffic & Network Safety Managers Comments: The potential for motorcycle collisions is noted, however reducing the kerb will remove deflection for all vehicles. Advanced roundabout signs are proposed as part of the scheme and motorcyclists should take appropriate action to reduce speed. .

5.7 Problem

Location: Splitter Islands.

Summary: Increased risk in loss of control type collisions due to ponding.

Description: The drainage drawing shows the levels falling from the centre of the roundabout outwards. However there is concern that ponding may occur around the splitter island. Ponding can lead to the formation of ice in cold weather, which could increase the risk of loss of control type collisions.

Recommendation: Ensure there is adequate drainage.

Designers Response: Accepted – drainage to be checked to ensure ponding does not occur.

Additional Comments: No longer considered a problem.

5.8 Problem

Location: North of Roundabout.

Summary: Cycle bypass may increase the risk of pedal cycle collisions.

Description: The proposals show the introduction of an off road cycle bypass link on the north side of the roundabout. However this will result in cyclists travelling from west to east relinquishing priority to vehicles accessing/exiting the proposed retirement village, and also stopping to re-join the carriageway east of the roundabout. The cyclists that are likely to use this section of carriageway are likely to be experienced and therefore remain on the carriageway rather than use the off road facilities. This may result in other road users being less tolerant towards cyclist due to cyclists not using the off road facilities and may increase the risk of pedal cycle collisions.

Recommendation: Remove the off-carriageway cycle/footway and provide a wider circulatory to provide sufficient space for a cyclist to negotiate the roundabout adjacent to other road users safely.

Designers Response: Partially Accepted – Cycleway to be removed to remove priority conflicts with vehicles entering/exiting the retirement village. However, the circulatory carriageway is currently designed to be 5m wide with a 4.6m overrun area. Providing extra carriageway width may result in vehicles attempting to overtake cyclists whilst they negotiate the roundabout, which could result in sideswipe accidents.

Additional Comments: Ensure adequate width is maintained adjacent to the splitter islands.

Traffic & Network Safety Managers Comments: Adequate width at splitter island to be maintained.

5.9 Problem

Location: General.

Summary: Potential dark spot may increase the risk of collisions.

Description: The proposals show the introduction of additional street lighting. However the new street lighting links to existing network at Glaisdale Road but terminates approximately 400m before Leven Bridge thus creating a dark area of approximately 500m. The inconsistency of the street lighting along this section of the A1044 Leven Bank Road may result in an increase in dark collisions.

Recommendation: Extend the street lighting to link into the existing lighting at Leven Bridge.

Designers Response: Lighting of this section of Highway was not considered as it was outside the remit of the scheme and would not form part of the section 278 works.

Additional Comments: No further comment.

5.10 Problem

Location: A1044 Leven Bank Road (westbound).

Summary: Incomplete pedestrian link may increase the risk of pedestrian/vehicular conflict.

Description: The proposals show a shared area on the north side of the roundabout. However the facilities terminate before the “tie in” of the existing footway. The incomplete link may result in pedestrians travelling along approximately 250m of uneven ground adjacent to live traffic. There is an increased risk of trips and falls and pedestrian/vehicular conflict.

Recommendation: Provide suitable pedestrian links from the new development.

Designers Response: Accepted – A pedestrian link from within the development to Spell Close is detailed within the development planning application. Pedestrian links currently shown around the circumference of the roundabout to be removed.

Additional Comments: No Longer considered a problem.

5.11 Problem

Location: A1044 Leven Bank Road (eastbound).

Summary: Substandard pedestrian crossing point may increase the risk of pedestrian/vehicular conflict.

Description: The proposals show a shared area on the north side of the roundabout which terminates east of the roundabout. There is an existing footway on the opposite side of the carriageway. There is concern that pedestrians may cross at this

location to continue their journey on the existing footway, thus increasing the risk of pedestrian/vehicular conflict.

Recommendation: Provide a suitable layout to discourage pedestrians crossing at this location.

Designers Response: Accepted – A pedestrian link from within the development to Spell Close is detailed within the development planning application. Pedestrian links currently shown around the circumference of the roundabout to be removed.

Additional Comments: No longer considered a problem.

5.12 Problem

Location: Southeast of proposed roundabout.

Summary: Right turning conflict from existing property access due to close proximity to roundabout.

Description: An existing property access will be approximately 35m east of the proposed roundabout. There is concern that vehicles turning right from the existing access may have a limited visibility to the left, thus increasing the risk of collisions occurring.

Recommendation: Check visibility splay and prohibit right turn movement out of the existing access if required.

Designers Response: Rejected – the existing access is to a single dwelling which currently has a substandard visibility splay to the west. The geometry of the proposed roundabout will not only reduce approaching traffic speeds, but also improve sight lines to approaching traffic by moving the main flow further north, away from the field boundary.

Additional Comments: No longer considered a problem.

Option A

5.13 Problem

Location: South side of proposed roundabout.

Summary: Increased risk of pedal cycle/vehicle collisions at the termination point of the westbound cycle bypass lane.

Description: The proposals show a cycle bypass lane on the south side of the roundabout. At the termination point the cyclist will enter the carriageway at 45 degrees in close proximity to the splitter island. There is concern that merging cyclists whilst entering the carriageway at a low speed at a narrow section of carriageway may have increased risk of collision with westbound vehicles.

Recommendation: Remove the cycle bypass lane and provide a wider circulatory to provide sufficient space for a cyclist to negotiate the roundabout adjacent to other road users safely.

Designers Response: Partially Accepted – Cycleway to be removed to remove priority conflicts with vehicles entering/exiting the retirement village. However, the circulatory carriageway is currently designed to be 5m wide with a 4.6m overrun area. Providing extra carriageway width may result in vehicles attempting to overtake cyclists whilst they negotiate the roundabout, which could result in sideswipe accidents.

Additional Comments: Ensure adequate width is maintained adjacent to the splitter islands.

8 Appendix A – Documents and Drawings

Documents

Audit Brief – Previous Audit
Exceptions Report

Drawings

TS10028-100-001 General Arrangement Option A -Layout1
TS10028-500-001 Drainage-Layout1
TS10028-1100-001 Kerbs, Footways & Paved Areas-Layout1
TS10028-1100-002 Kerbs, Footways & Pavements Details-Layout1
TS10028-1200-001 Road Markings & Traffic Signs-Layout1
TS10028-SK004 General Arrangement Option B-Layout1
TS10028-3000-01 Landscape and Planting Plan



8 Location Plan

