

Heartwood Forest Access, Sandridge
Stage 1 Road Safety Audit

Woodland Trust
July 2009

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1 Introduction

This report results from a Stage 1 Road Safety Audit carried out for the proposed priority junction access arrangement to Heartwood Forest in Sandridge, Hertfordshire. The audit was carried out at the request of the Design Organisation: EAS Transport Planning Ltd on behalf of the Woodland Trust.

The report indicates each of the problems identified together with recommendations to solve or mitigate the problems, the Audit Team Statement and a schedule of documents reviewed.

The members of the Audit Team were:

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The audit took place at AECOM's St. Albans office during July 2009. The audit comprised of an examination of the documents provided by the designers (see Appendix A). In addition to examining the documents supplied, the Audit Team visited the site of the proposed measures on Thursday 02nd July 2009. Weather conditions during the site visit were clear and sunny with a dry carriageway surface.

The locations of problems are shown in Appendix B where the reference numbers relate to the problems identified in this report.

The terms of reference of the audit are as described in Road Safety Audit Standard HD 19/03 in The Highways Agency Design Manual for Roads and Bridges (DMRB). The advice issued in the DMRB applies to trunk road and motorway highway improvement schemes; however, it has been used in this report to define the scope of this audit.

The team has examined and reported only on the road safety implications of the measures as presented and has not specifically examined or verified the compliance of the designs to any other criteria.

No departures from standards have been notified to the Audit Team on the proposals.

All traffic sign and road marking diagram number references are made to The Traffic Signs Regulations and General Directions, 2002 (TSRGD).

2 Site Description

The site is located immediately north of the village of Sandridge in the St Albans District, Hertfordshire. Sandridge is situated north of the city of St Albans, and located in relative close proximity to the M25 London Orbital and M1 motorways.

The B651 is a single lane two-way carriageway orientated approximately south-north between St Albans and Hitchin respectively. The carriageway is approximately 6.2m wide. The B651 is subject to a 30mph through the village of Sandridge, increasing to 40mph immediately north of the junction with Coleman Green Lane. Coleman Green Lane is a single lane two-way carriageway which is subject to National Speed Limit. Coleman Green Lane joins the B651 along the eastern frontage. The 40mph speed limit on the B651 increases to the National Speed Limit approximately 270m north of the junction with Coleman Green Lane. A public "Right of Way" footpath is setback behind the hedgerow along the western frontage of the B651, and ties in with a narrow footway which provides pedestrian access to Sandridge.

Land use in the audit area is predominantly a mixture of rural open space and arable farm land, with residential land use in the village of Sandridge. A residential care home is located on the outskirts of Sandridge along the western frontage of the B651, approximately 100m south of the proposed site. Nomansland Common, a cricket ground, and the Wicked Lady Public House are all located approximately 1 mile north of the site.

A system of street lighting is present within Sandridge but was not seen during the hours of darkness. No street lighting is located near the proposed site which is situated outside of the village. Retro-reflective road studs are provided along the B651 to help demarcate the lane divisional markings during the hours of darkness and in poor visibility conditions.

The proposed highway design is to allow access to Heartwood Forest which is due to be planted on over 850 acres of arable land to the north of Sandridge. The proposed access is situated along the western frontage of the B651, immediately north of Coleman Green Lane.

Weather conditions during the site visit on Thursday 02nd July 2009 were clear and sunny with a dry carriageway surface. The audit was undertaken during the afternoon off-peak traffic hours of 13:00 to 15:00.

Proposals:

The Woodland Trust is proposing the plantation of a forest (named as Heartwood Forest) over 850 acres of arable land to the north of Sandridge. Access to Heartwood Forest is proposed to be via a simple give way priority junction on the western frontage of the B651, and includes the following features:

- Give way junction arrangement with 15m corner radii and central hatched road markings to help segregate traffic entering / egressing the site
- Uncontrolled pedestrian crossing facility on the proposed access road to tie in with the existing footpath along the western frontage of the B651
- Relocation of the existing 30/40mph speed limit terminals to the north of the proposed access
- 'SLOW' road markings with buff coloured surfacing and gateway sign features at the northern and southern extents of the proposed site
- Gating system to prevent vehicular access to the forest outside of opening hours
- Clearance of the existing hedgerow along the western frontage of the B651 to maintain a visibility splay of 4.5 x 120m to the north and 4.5 x 90m to the south as measured from the junction give way
- A Stopping Sight Distance (SSD) of 120m on the southbound junction approach.

3 Items Resulting from the Stage 1 Road Safety Audit

Details of the following items were not submitted for auditing, therefore no specific problems have been identified at this stage:

- Direction and Advanced Direction Signs
- Drainage
- High Friction Surfacing
- Illuminated bollards
- Landscaping
- Site clearance
- Street lighting
- Vertical alignment.

The following Problems have been identified from the documents submitted:

GENERAL:**3.1****Problem**

Location: Hedgerow and vegetation fronting the B651

Drawing: SK01

Summary: Clearance of existing hedgerow to achieve proposed visibility splays



Description:

No details are shown to identify the extent of the existing vegetation which is to be cleared for achieving the visibility splays proposed. The auditors noted that a considerable area of the existing hedgerow along the western frontage of the B651 will require removal. As no details of the proposed landscaping and site clearance have been provided, the auditors are unable to comment further on the potential road safety implications.

In addition, the existing vegetation will require removal at the following locations:

- a) Vegetation will need to be removed on the approaches to the proposed junction to ensure unobstructed visibility between pedestrians waiting at the uncontrolled crossing points on the access road and approaching vehicles
- b) Removal of the existing vegetation will be required to ensure unobstructed visibility to the relocated speed limit signs and gateway features.

Failure to provide sufficient visibility on the exit and approaches to the junction is likely to result in the increased risk of conflict.

The auditors noted that the existing hedgerow fronting the B651 helped to demarcate the horizontal alignment of the carriageway. Clearance of the hedgerow on the approaches to the proposed access is therefore likely to reduce the demarcation of the carriageway alignment, and could increase the risk of loss of control collisions on corners (particularly for road users travelling at inappropriate speeds during dark or poor visibility conditions). Additional measures will therefore be required to improve the conspicuity of the carriageway alignment.

Recommendation:

The hedgerows on the approaches to the proposed access will require removal to achieve the visibility splays proposed. Details of the proposed landscaping and removal of the existing vegetation should be provided in future road safety audit submissions. Consideration should be given to periodic maintenance, particularly during summer months, to ensure sufficient visibility is retained.

Forward visibility to all regulatory signs should be maintained in accordance with Chapter 3 of the Traffic Signs Manual.

Additional measures will be required to improve the conspicuity of the carriageway alignment. This could be achieved through the provision of verge side marker posts with reflective bands on the corner radii to help delineate the carriageway alignment where the existing hedgerow is to be removed.

3.2**Problem**

Location: Western kerblines of the B651 at the access to Heartwood Forest

Drawing: SK01

Summary: Gully and dropped kerb located within the proposed access area

Description:

An existing gully is situated along the western kerblines of the B651, north of Coleman Green Lane, within the area proposed for the vehicular access to Heartwood Forest. Retaining the existing gully could present a slip hazard for cyclists and powered two wheelers turning into the access (particularly during damp or wet conditions), and could result in ponding along the western kerblines to the south of the access.

A dropped kerb is also located along this kerblines, at the termination point of the public footpath. It is unclear if this is to be relocated as part of the scheme proposals, and how the existing provision will tie-in with the proposed pedestrian facilities to the new development.

Recommendation:

A drainage / level survey should be undertaken and the existing gully relocated outside of the junction mouth where recommended. Clarify whether the existing dropped kerb is to be retained or relocated as part of the scheme proposals.



THE ALIGNMENT:

No comments.

THE JUNCTIONS:

3.3

Problem

Location: B651 junction with the proposed access to Heartwood Forest

Drawing: SK01

Summary: Vehicle swept paths

Description:

The vehicle swept path analysis provided suggests that long vehicles (including coaches of 12m length) will significantly overhang the eastern kerblines of the B651 whilst turning right on the exit from the development. This is likely to increase the risk of turning vehicles conflicting with vegetation and street furniture located on the verge, as well as encourage coach driver's to undertake an easier turning radius by encroaching onto the central hatched area and opposing traffic lane. As no details have been provided regarding the proposed landscaping in the vicinity of the proposed access, the auditors are unable to comment further on the potential road safety implications.

Vehicles are also shown to over-run the hazard road markings and northern kerblines at the western extent of the access road where the carriageway narrows to single lane. This presents a risk of head-on collisions as road users may not expect oncoming vehicles to encroach into the opposing traffic lane, particularly if forward visibility is restricted on the approach due to the presence of vegetation fronting the carriageway (details of which have not been provided). The auditors have been informed by the designers that the internal layout of the access road is shown at this stage as indicative only and therefore subject to change.

Furthermore, the road markings are likely to become prematurely worn if frequently over-run by turning vehicles and will likely require maintenance.

Recommendation:

Implement measures to ensure that vehicles exiting the access road onto the B651 do not overhang the kerblines or encroach into the central hatching and opposing traffic lane.

The central hazard road markings at the western extent of the access need to be reduced where two opposing lanes cannot be maintained, or alternatively the carriageway widened to permit the safe manoeuvre of two-way traffic. Sufficient forward visibility should be provided on the approaches to the narrowing of the carriageway to minimise the potential for head-on conflict.

NON-MOTORISED USER PROVISION:

3.4

Problem

Location: B651 junction with the proposed access to Heartwood Forest

Drawing: SK01

Summary: Unclear pedestrian facilities



Description:

A pedestrian crossing facility is proposed across the Heartwood Forest access, set back approximately 10m from the junction mouth. Pedestrian crossing studs to TSRGD Diag. 1055.1 shown to be installed at the uncontrolled crossing. Pedestrian crossing studs should only be used where traffic is under traffic signal control, and consequently the proposed use of the studs at an uncontrolled crossing may confuse both pedestrians and motorists as to who has right of way across the access. This could lead to an increased risk of pedestrian to vehicle conflict.

In addition, the auditors noted that the existing footway south of the access, between Sandridge and the public footpath, is narrow (maximum width of 0.8m) and subject to encroachment by overgrown vegetation.

Recommendation:

Pedestrian studs should not to be used for the uncontrolled pedestrian crossing facility, whilst tactile paving and dropped kerbs are to be installed in accordance with the DETR's "Guidance on the use of Tactile Paving Surfaces".

It should be acknowledged that Heartwood Forest is likely to encourage increased use of the footway north of Sandridge, and the public footpath. The existing footway should be widened to a minimum width of 2m with an additional 0.25m to allow for 'kerb shyness' due to one side being bound by vegetation. The quality of the existing footpaths should be improved to encourage use by pedestrians and the mobility impaired.

3.5 Problem

Location: Proposed access to Heartwood Forest

Drawing: SK01

Summary: Width of internal access road

Description:

The proposed access road within Heartwood Forest is shown to a width of 3.5m. The relatively narrow carriageway width is unlikely to be suitable for vehicles to safely overtake a cyclist, particularly given that coaches are expected to use the access road. As no details have been provided to identify the cycle routes within Heartwood Forest, and subsequently how they are expected to access the site, the auditors are unable to comment further on the potential road safety implications. The auditors have been informed by the designers that the internal layout of the access road is shown at this stage as indicative only and therefore subject to change.

Recommendation:

Provide sufficient carriageway width along the proposed access road to allow vehicles to safely overtake a cyclist. Further details of the cycle access to the forest should be provided in future road safety audit submissions.

ROAD SIGNS, CARRIAGEWAY MARKINGS AND STREET LIGHTING:

3.6 Problem

Location: B651 approaches to the proposed access to Heartwood Forest

Drawing: SK01

Summary: No details shown for the installation of 'New Road Layout Ahead' (NRLA) road signs

Description:

No details are shown for the installation of temporary 'New Road Layout Ahead' signs to TSRGD Diag. 7014v. in advance of the hazard. Approaching motorists are unlikely to have sufficient awareness of the new layout and operation of the road, potentially resulting in an increased risk of conflict involving road users unfamiliar with the new road layout.

Recommendation:

Ensure signs to TSRGD Diag. 7014v are located sufficiently in advance of the hazard and in an area of footway without obstruction of pedestrian passage. Full consideration should be given to maintaining sufficient forward visibility to all existing and proposed road signs.

3.7

Problem

Location: B651 junction with the proposed access to Heartwood Forest

Drawing: SK01

Summary: No destination signing proposed to identify the access to Heartwood Forest

Description:

No local (or tourist) destination signs are shown to indicate the location of the access to Heartwood Forest. This is a particular issue as Heartwood Forest is expected to attract up to 80,000 to 100,000 visitors per year, as stated in the Transport Statement. It is likely that visitors unfamiliar with the local area or forest location may hesitate on the approach to the access due to inadequate signing, leading to excessive braking, sudden turning manoeuvres and potential shunt-type collisions.

**Recommendation:**

Local destination (or tourist destination) signs should be installed on the approaches and / or opposite the proposed junction access.

3.8 Problem

Location: Gateway features on the B651 approaches to the proposed access

Drawing: SK01

Summary: Unclear signing arrangement on gateway features

Description:

An existing gateway feature is located on the eastern frontage of the B651, immediately north of Coleman Green Lane, informing southbound road users that they are entering Sandridge. An additional destination sign is located on the B651 southbound approach, south of Coleman Green Lane. No details are shown for the removal of the existing gateway / signs, whilst two new gateway features are shown for installation to the north and south of the proposed access to Heartwood Forest.

The example text shown for the proposed gateway signs is unlikely to be suitable for both gateways to the north and south of the proposed access. Unclear signing could result in confusion for road users, increasing the risk of excessive braking, sudden turning manoeuvres and potential shunt-type collisions.

Recommendation:

Clarify the signing arrangement to be installed on the gateway features, ensuring that the signs are clearly visible to approaching traffic.

3.9 Problem

Location: Proposed gateway features on the B651 approaches to the proposed access

Drawing: SK01

Summary: Location of proposed gateway features

Description:

The proposed gateway features, in particular those located on the western verge, are likely to be positioned amongst the existing hedgerow and vegetation. The existing vegetation is likely to obstruct forward visibility to the gateway features. Poor visibility to the gateways is likely to reduce the effectiveness of the feature as a traffic calming measure.

In addition, the gateway feature along the western side of the B651, to the north of the proposed access, is shown to be located across the existing footpath. The slopes of the verges along both sides of the carriageway may present a construction issue upon implementation of the gateway features. No details of landscaping have been provided for the auditors to comment further.

Recommendation:

The gateways should be sited in an area of the verge with sufficient forward visibility for approaching traffic and without obstruction of pedestrian desire lines. Details of the proposed landscaping and removal of the existing vegetation should be provided in future road safety audit submissions. Regular maintenance of the vegetation is likely to be required.



3.10**Problem**

Location: B651 proposed speed limit extent

Drawing: SK01

Summary: Speed limit signing may be obscured by vegetation, and less conspicuous than existing

Description:

The existing 30/40mph speed limit signs on the B651 are to be relocated north of the proposed access, within close proximity to existing vegetation along both frontages of the B651. A 30mph speed limit roundel is also proposed to be located within the southbound carriageway, a few metres south of the speed limit terminal signs. The proximity of the vegetation is likely to partially obstruct forward visibility to the signs, whilst it is unclear why the proposed 30mph roundel marking is to be located away from the speed limit terminal signs.



For the reasons stated above, the proposed layout is likely to be less conspicuous than the existing arrangement provided immediately north of Coleman Green Lane, where a red surface treatment and carriageway roundel markings have been installed alongside the speed limit terminal signs. Reduced conspicuity of the speed limit signing and markings may encourage poor speed compliance on the southbound approach to the proposed access, increasing the risk of speed-related collisions.

The audit team also noted that the 40mph 'transition zone' between the National Speed limit and relocated 30mph is to be significantly reduced in length from approximately 250m to 140m. Reducing the transition distance over which the speed limit is reduced is likely to further encourage poor speed compliance on the southbound approach to the proposed development access, increasing the risk of potential speed related or shunt-type collisions.

As no details have been shown as to whether the existing National Speed limit is to be retained or relocated as part of the scheme proposals, the auditors are unable to comment further.

Recommendation:

A layout similar to the existing 30/40mph speed limit transition north of Coleman Green Lane should be provided for the proposed arrangement north of the access. A red surface treatment and carriageway roundel markings should be provided alongside the speed limit terminal signs to improve conspicuity of the change in speed limit and encourage compliance of the speed limit.

The existing length of the 40mph 'transition zone' should be retained, with further traffic calming measures required if speed compliance is likely to be an issue on the approaches to the proposed access. Staggered junction ahead warning signs to TSRGD Diag. 507.1v could be installed on the B651 approaches to the junction to further encourage motorist caution whilst approaching the access and Coleman Green Lane.

4 Audit Team Statement

I certify that this Road Safety Audit has been carried out in accordance with Road Safety Audit Standard HD 19/03.

No one on the Audit Team has been involved with the design of the measures.

AUDIT TEAM LEADER:

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There were no other persons involved in this audit than previously stated above.

Enquiries regarding this Road Safety Audit should be made to the Audit Team Leader at the above address or email RoadSafety@AECOM.com

Appendix A – Documents Submitted to the Audit Team

The following documents were submitted as part of the Road Safety Audit:

Document No.	Rev.	Description	Date
SK01	-	Junction Layout	25/06/09
-	-	Highway Boundary	22/06/09
081/2008	-	Transport Statement	-
B651 / Site Access PICADY	-	Vehicle Flow Model	26/06/09

Appendix B – Location of Problems Drawings