

# M2 Junction 5 Improvement Scheme

Stage 1 Road Safety Audit

Highways England

February 2019

# Notice

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This document has 15 pages including the cover.

## Document history

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## Client signoff

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# 1. Introduction

This report results from a Stage 1 Road Safety Audit (RSA) carried out for the M2 Junction 5 Improvement scheme.

The scheme is located at the M2 Junction 5 (Stockbury Roundabout) in Kent and its approaches from the M2, A249 and local roads. The M2 slip roads are trunk roads under the responsibility of Highways England, Area 4; the A249 north of the roundabout forms DBFO Area 34 and the A249 south of the roundabout, as well as the adjacent local roads, are managed by Kent County Council.

The scheme comprises improvements to the slip roads as well as providing a flyover on the A249 together with changing access arrangements to/from the local side roads.

The RSA brief described no specific strategic decisions. However, the RSA team confirms and acknowledges that recommendations to make significant changes in relation to strategic decisions are unlikely to be acceptable.

The RSA brief and its supporting information (itemised in Appendix A of this RSA report), was supplied by Chris Roberts (Atkins) on behalf of the Atkins Project Manager, Harshal Cholake.

Sarah Jackson-Proes from Highways England has delegated the project manager role to Camelia Lichti who has approved the RSA team and the contents of the RSA Brief.

The RSA team membership for this Stage 1 RSA was as follows:

- **Audit team leader:** **Mark Gregory BSc MSc MCIHT MSoRSA**  
Senior Road Safety Consultant  
Atkins Transportation, Chelmsford  
(Certificate of Competency in RSA gained in 2013)
- **Audit team member:** **Neil Hutchings MIHE MSoRSA**  
Senior Consultant  
Atkins Transportation, Aldershot  
(Certificate of Competency in RSA gained in 2013)

The RSA team visited the site together on Tuesday 12<sup>th</sup> February 2019 between 10:15 and 11:40. The weather was mainly sunny and bright. The road surfaces were dry. Traffic on the M2 slip roads, the A249 approaches, the circulatory carriageway of Stockbury Roundabout and the local side roads was free-flowing and no significant congestion was observed.

The terms of reference of this Stage 1 RSA are as described in GG 119. The RSA 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.

## Scheme description

The proposed scheme measures described in the RSA brief are summarised as follows:

### Proposals at M2 Junction 5

The A249 Stockbury Roundabout will become a grade-separated junction with the A249 flying over the roundabout on two single span bridges and approach embankments/retaining walls. The roundabout will remain in a similar position but enlarged to accommodate connections.

Four new slip roads will be provided and include dedicated left-turn lanes at the roundabout for the following turning movements:

- A249 southbound to M2 westbound;
- A249 northbound to M2 eastbound; and
- M2 eastbound to A249 northbound.

The A249 northbound exit slip road will be a TD 22/06 Type B parallel diverge and the A249 northbound entry slip will be a Type C ghost island lane merge. The A249 southbound exit slip road will be a TD 22/06 Type B parallel diverge and the A249 southbound entry slip will be a Type B parallel merge.

### Proposals at Side Roads

The Maidstone Road connection to Stockbury Roundabout will be stopped up and a new Maidstone Road link provided, connecting to Oad Street north of the M2.

An Oad Street link will be provided to connect Oad Street directly into Stockbury Roundabout. Oad Street will remain open for local access to properties but will not have direct access onto the A249 as currently exists. The existing southbound lanes of the A249 will be retained south of the existing junction with Oad Street and this will be converted into a two-way single carriageway to provide continued access to properties and land fronting this section of road and connection to South Green Lane.

The Honeycrook Hill junction with the A249 will be stopped up.

## Notes and clarifications

At the request of the RSA team, the design team clarified that the existing signals on Stockbury Roundabout will be removed.

The brief notes that the Walking, Cycling and Horse Riding Review report is currently a work in progress. It also notes that there are no proposals to provide at-grade crossing facilities on the A249 at the bus stop locations.

Further clarification was received to say that:

*“We have recently made the decision to remove the bus stops due to safety concerns but retain the areas as a grasscrete verge for maintenance vehicle access.”*

## 2. Items raised at this Stage 1 RSA

Where problems have a specific location, these are shown on the annotated plan in Appendix B. It should be noted that each problem is cross-referenced to a drawing number for location purposes only. The named drawing is not necessarily the source from which the problem was identified.

### PROBLEM 1

**Location :** A249 southbound off-slip

**Drawing:** HE551521-ATK-HGN-XX\_ML-DR-CH000103 & CH000104

**Summary:** High approach speeds leading to risk of nose-to-tail collisions and road users failing to give way at the roundabout and losing control

The RSA brief states that the A249 southbound off-slip (A249\_L1) has a design speed of 70 kph and a retained speed limit of 70 mph and, also, that the requisite sight-stopping distance cannot be achieved. This speed limit together with the length of the slip road might encourage road users to maintain high speeds which could result in an increased risk of:

- Nose-to-tail collisions with vehicles stationary at the roundabout give way line;
- Collisions with vehicles circulating the roundabout or road users continuing on to the central island;
- Late lane-changing collisions as road users in lane one move to the offside to avoid the exclusive left-turn slip road and;
- Road users losing control on the exclusive left-turn slip road and colliding with the channelisation island.

The road markings and signing indicate there is only one sign, (ref: TS-056) that shows that the nearside lane is dedicated to the exclusive left-turn lane which also increases the risk of late lane changes.

### RECOMMENDATION

Speed-reduction measures should be provided for the A249 mainline and northbound off-slip. Signing in advance of and at the exclusive left-turn should be improved to adequately highlight its presence.

### PROBLEM 2

**Location:** A249 northbound off-slip

**Drawing:** HE551521-ATK-HGN-XX\_ML-DR-CH000102 & CH000103

**Summary:** High approach speeds leading to risk of nose-to-tail collisions, road users failing to give way at the roundabout and side-swipe collisions

The RSA brief states that A249 northbound off-slip (A249\_L4) has a design speed of 70 kph and a retained speed limit of 70 mph and, also that the requisite sight-stopping distance cannot be achieved. The A249 northbound off-slip becomes the M2 westbound on-slip. This arrangement, together with the length of the slip road, might encourage road users to maintain high speeds which could result in an increased risk of:

- Nose-to-tail collisions with vehicles stationary at the roundabout give way line;
- Collisions with vehicles circulating the roundabout or continuing on to the central island and;
- Collisions with slower moving vehicles, especially lorries from the roundabout moving to the nearside lane on the M2 westbound on-slip.

## RECOMMENDATION

Speed-reduction measures should be provided for the A249 mainline, northbound off-slip and westbound on-slip.

### PROBLEM 3

**Location:** Lay-by on A249 southbound carriageway, north of M2 J5

**Drawing:** HE551521-ATK-HGN-XX\_ML-DR-CH000104

**Summary:** Lay-by too close to the A249 southbound off-slip

On the A249 southbound carriageway, there is lay-by between the ½ mile advance direction sign (ADS) and the 300 yards countdown sign for the junction. Some southbound road users might mistake the lay-by for the off-slip and travel into the lay-by and collide with parked vehicles at high speed.

Furthermore, there could be a risk of weaving collisions involving road users attempting to leave the lay-by as road users on the A249 are moving left on approach to the southbound off-slip.

## RECOMMENDATION

The lay-by should be closed or relocated further away from the junction.

### PROBLEM 4

**Location:** Carriageway between J5-L1 and J5-L3 access roads

**Drawing:** HE551521-ATK-HGN-XX\_ML-DR-CH000102

**Summary:** Potential lack of pedestrian facilities

The two bus stops currently located south of Stockbury Roundabout (near Oad Street) are being relocated to the new access road (J5-L3). It is noted that the WCHAR report is not yet complete and a decision has still to be made on any facilities such as footways to be provided between the new access road (J5-L3) and the residential properties where the bus stops are currently located (J5-L1).

In the absence of footways pedestrians may walk in the carriageway to and from the bus stops and would, thereby, be at risk of being struck by fast moving vehicles. Furthermore, in the absence of any crossing facilities or guidance, pedestrians would be at risk of being struck by vehicles while crossing the junction between J5-L1 and J5-L3.

## RECOMMENDATION

Footways should be provided to provide for pedestrians heading between the bus stops and nearby residences or commercial premises. Crossing facilities and guidance should be provided for pedestrians crossing the junction between J5-L1 and J5-L3.

### PROBLEM 5

**Location:** A249 northbound, in advance of Church Hill

**Drawing:** HE551521-ATK-HGN-XX\_ML-DR-CH000101

**Summary:** Risk of northbound road users mistaking Church Hill for the off-slip towards the M2 J5

The drawing indicates that ADSs for the northbound off-slip towards the M2 at Junction 5 would be provided some distance upstream of the A249 junction with Church Hill. Whilst a separate tourist sign to the Tudor Rose craft centre in Church Hill would also be provided, there would still be a risk that road users might mistake the Church Hill junction for the off-slip towards the M2. This might result in collisions involving sudden course-changes, or nose-to-tail collisions resulting from heavy braking in the vicinity of the Church Hill junction.

## RECOMMENDATION

The design should incorporate measures to make it clear that the Church Hill junction is not the off-slip towards the M2.

### 3. RSA team statement

We certify that this road safety audit has been carried out in accordance with GG 119.

#### RSA team

##### Road safety audit team leader

**Name:** Mark Gregory BSc MSc MCIHT MSoRSA

**Signed:**  .....

**Position:** Senior Road Safety Consultant

**Organisation:** Atkins Limited

**Date:** 19<sup>th</sup> February 2019

##### Road safety audit team member

**Name:** Neil Hutchings MIHE MSoRSA

**Signed:**  .....

**Position:** Senior Consultant

**Organisation:** Atkins Limited

**Date:** 19<sup>th</sup> February 2019

# Appendices

# Appendix A. Stage 1 RSA brief

## A.1. RSA brief

- HE551521-ATK-GEN-XX-PC-ZS-000001

## A.2. Drawings

Drawing No.	Title/Description	Rev.	Date
HE551521-ATK-HGN-XX_ML-DR-CH-000100	General Arrangement - NOTES & KEYS	C03	17/01/2019
HE551521-ATK-HGN-XX_ML-DR-CH-000101 to CH-000106	1:1000 General Arrangement (Sheet 01 to 06)	C03	17/01/2019
HE551521-ATK-HGN-XX_XS-DE-CH-000001 to CH-000006	Typical Verge Details (Sheet 01 to 06)	C02	11/01/2019
HE551521-ATK-HGN-XX_XS_Z-DR-CH-000001	Typical Cross Section Key Plan (1:2500)	C02	11/01/2019
HE551521-ATK-HGN-XX_XS-DR-CH-000001 to CH-000007	Typical Cross Sections (Sheet 01 to 07)	C02	11/01/2019
HE551521-ATK-HMC-XX-DR-CH-000001	Schematic Merge and Diverge	C02	11/01/2019
HE551521-ATK-HML-A249_LS_A-DR-CH-000001 to CH-000002	Longitudinal Section A249 North Bound (Sheet 1 to 2)	C02	11/01/2019
HE551521-ATK-HML-A249_LS_B-DR-CH-000001 to CH-000002	Longitudinal Section A249 South Bound (Sheet 1 to 2)	C02	11/01/2019
HE551521-ATK-HML-A249_LS-DR-CH-000003 to CH-000004	Longitudinal Section A249 Slip Road (Sheet 1 to 2)	C02	11/01/2019
HE551521-ATK-HML-A249_J1_LS-DR-CH-000001	Longitudinal Section J5 RB, M2 L1 & M2 L2 (Sheet 1 of 3)	C02	11/01/2019
HE551521-ATK-HML-A249_J1_LS-DR-CH-000002	Longitudinal Section J5 L1, J5 L3 & J5 L4 (Sheet 2 of 3)	C02	11/01/2019
HE551521-ATK-HML-A249_J1_LS-DR-CH-000003	Longitudinal Section Segregated Left Turn Roads (Sheet 3 of 3)	C02	11/01/2019
HE551521-ATK-HML-R1_LS-DR-CH-000001	Longitudinal Section New Maidstone Road Link	C02	11/01/2019
HE551521-ATK-HML-XX-DR-LM-000101 to LM-000106	1:1000 Engineering Constraint (Sheet 01 to 06)	C02	11/01/2019
HE551521-ATK-HML-XX_J1-DR-CH-000201 to CH-000206	1:1000 Departure from Standard (Sheet 01 to 06) (HE)	C02	11/01/2019

HE551521-ATK-HRR-XX_ML-DR-CH-000100	Proposed Road Restraint System - NOTES & KEYS	C02	11/01/2019
HE551521-ATK-HRR-XX_ML-DR-CH-000101 to CH-000106	1:1000 Proposed Road Restraint System (Sheet 01 to 06)	C02	11/01/2019
HE551521-ATK-VUT-XX_ML-DR-CH-000100	Existing Utilities - NOTES & KEYS	C02	11/01/2019
HE551521-ATK-VUT-XX_ML-DR-CH-000101 to CH-000106	1:1000 Existing Utilities (Sheet 01 to 06)	C02	11/01/2019
HE551521-ATK-HAC-XX_ML-DR-CH-000001 to CH-000002	Land Take Plan (Sheet 1 to 2)	C03	15/01/2019
HE551521-ATK-EGN-XX-GS-GI-000001	Figure: A.1 Environmental Constraints Plan	P01	29/08/2018
HE551521-ATK-HSN-XX-DR-CH-000101	Proposed Traffic Signs and Road Markings	C01	08/02/2019
HE551521-ATK-HSN-XX-DR-CH-000102	Proposed Traffic Signs and Road Markings	C01	08/02/2019
HE551521-ATK-HSN-XX-DR-CH-000103	Proposed Traffic Signs and Road Markings	C01	08/02/2019
HE551521-ATK-HSN-XX-DR-CH-000104	Proposed Traffic Signs and Road Markings	C01	08/02/2019
HE551521-ATK-HSN-XX-DR-CH-000105	Proposed Traffic Signs and Road Markings	C01	08/02/2019
HE551521-ATK-HSN-XX-DR-CH-000106	Proposed Traffic Signs and Road Markings	C01	08/02/2019

## Appendix B. Problem location plan

The plan overleaf illustrates the locations of problems raised in Section 2 of this Stage 1 RSA.



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