Smart motorways

Emergency area width review

Highways England response

highways england

Emergency area width review - response

Contents

Executive summary

Last year's *Smart motorway evidence stocktake and action plan* sought to gather the facts on smart motorway safety and set out an action plan to ensure smart motorways are as safe as possible.

The *Smart motorway safety evidence stocktake and action plan* [1] included the following action relating to emergency area widths:

> *'DfT has heard concerns about the width of some existing emergency areas where it is less than the current 15-foot-wide standard when measured from the edge of the carriageway. Though these slightly narrower emergency areas are still significantly wider than an 11-foot-wide traditional hard shoulder, we are committing to review these and if feasible and appropriate we will widen to the current standard.'*

An independent review [2] was carried out to address this action. This identified 13 emergency areas which should be subject to further investigation after being identified as being below 14 foot 5 inches (4.4 metres) wide.

Conclusions and actions

We have reviewed the emergency areas identified as being below 14 foot 5 inches (4.4 metres). Analysis shows that no personal injury collisions have been attributed to any of the emergency areas below 14 foot 5 inches (4.4 metres) in width. The actions of this report are summarised below.

	Motorway	Link	Direction	Marker post	Verified average width	Action we will be taking
All lane running	M1	J32 to 33	NB	A 253/8	12 foot and 2 inches (3.70 metres)	**Widen**
		J30 to 31	NB	A 241/0	15 foot and 0 inches (4.58 metres)	**No action required** – exceeds 14 foot 5 inches in width
		J30 to 31	NB	A 244/2	14 foot and 10 inches (4.53 metres)	
	M25	J24 to 23	Anticlockwise	B 136/7	14 foot and 8 inches (4.47 metres)	
		J5 to 6	Clockwise	A 39/0	13 foot and 1 inch (4.00 metres)	**Widen**
	M3	J3 to 2	EB	B 38/5	13 foot and 2 inches (4.02 metres)	**Retain** – widening is likely to reduce visibility of the emergency area and the cost of widening is highly disproportionate to the likely benefits. Operational mitigations have been identified and are in place.
Dynamic hard shoulder running	M6 M42 M5	Various	Various	7 sites	TBC - the width will be verified as part of work to convert to all lane running	**Further analysis** – to be undertaken as part of the conversion from dynamic hard shoulder running to all lane running upgrade projects.

1. Introduction

Last year's *Smart motorway evidence stocktake and action plan* sought to gather the facts on smart motorway safety and set out an action plan to ensure smart motorways are as safe as possible.

The Action Plan included the following action relating to emergency area widths:

> *'DfT has heard concerns about the width of some existing emergency areas where it is less than the current 15-foot-wide standard when measured from the edge of the carriageway. Though these slightly narrower emergency areas are still significantly wider than an 11-foot-wide traditional hard shoulder, we are committing to review these and if feasible and appropriate we will widen to the current standard.'*

An independent review was carried out to address this action. This is documented in the emergency area width review technical report [2] which:

- reviewed the width of emergency areas across England's smart motorway network
- concluded that, for those between 14 foot 5 inches and 15 foot (4.4 and 4.6 metres) wide, there is no measurable safety benefit compared to the current standard width of 15 foot (4.6 metres) to justify an intervention
- identified that those less than 14 foot 5 inches (4.4 metres) wide should be subject to further investigation – this totalled 13 emergency areas (the subject of this report)
- undertook a location specific high-level assessment on the feasibility of potential widening interventions for those less than 14 foot 5 inches (4.4 metres) wide.

We have now reviewed the emergency areas identified as being below 14 foot 5 inches (4.4 metres) to assess the viability and impact of widening.

Document purpose

The purpose of this report is to:

- document the on-site measurements taken to validate the width of emergency areas in the emergency area width review technical report [2]
- set out for those sites less than 14 foot 5 inches (4.4 metres) wide the findings of a detailed site-specific review of the options available to widen each emergency area
- document the reasons for the decision to widen or not

Emergency area width review - response

Scope of the report

There are six emergency areas on all lane running sections identified as being less than 14 foot 5 inches (4.4 metres) by the emergency area width review independent review report [2].

Note: There are another seven sites that were identified by the emergency area width independent review report [2] as being less than 14 foot 5 inches (4.4 metres) wide. These are located on sections of dynamic hard shoulder running, where the hard shoulder is utilised as a running lane when the section is heavily congested. A review of injury accident data and traffic officer feedback has established that the width of these emergency areas has not caused any operational issues. These emergency areas have been operational for between seven and 15 years.

We will upgrade dynamic hard shoulder sections to all lane running by the end of March 2025. These seven emergency areas will be investigated as part of the design phase of the upgrade. We will validate widths with actual site measurements, and any mitigating actions on those with widths below 14 foot 5 inches (4.4 metres) will be carried out as part of the scope of the respective schemes.

2. Emergency area width measurement

The emergency area width review technical report [2] estimated emergency area widths using high definition imagery data captured from vehicle surveys alongside extensive ground and aerial light detection and ranging (LiDAR) data, where available. Where this was not available measurements were taken using online mapping.

Subsequently, actual on-site measurements were taken to accurately determine the width of the six all lane running emergency areas identified as being less than 14 foot 5 inches (4.4 metres).

Methodology

Three measurements were taken at the start, midpoint and end of the emergency area stopping area as shown in Figure 1 below.

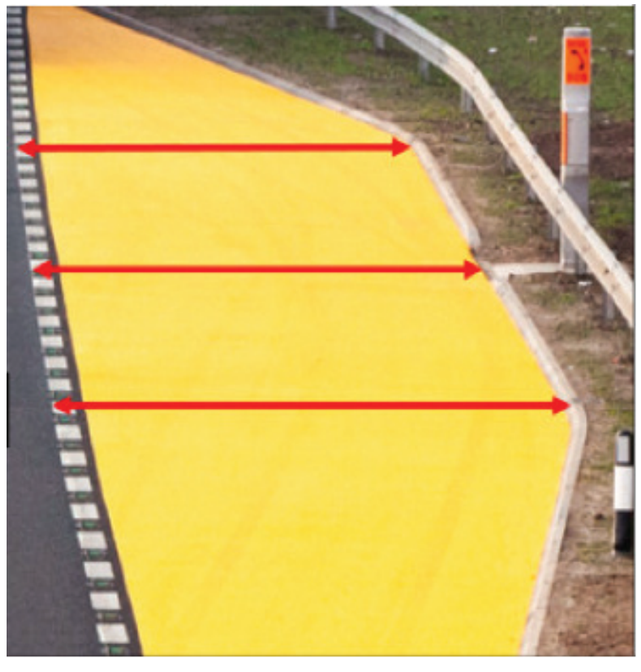

Figure 1 Emergency area width measurement locations

Emergency area width review - response

Results

Our measurements demonstrated that three of the emergency areas previously estimated to be fractionally less than 14 foot 5 inches (4.4 metres) wide actually exceeded this value (see blue highlight). The three sites with a verified average width below 14 foot 5 inches (4.4 metres) detailed in table 1 below (orange highlight) are considered further within subsequent sections of this report.

Motorway	Link	Direction	Marker post	Verified average width
M1	J32 to 33	NB	A 253/8	12 foot and 2 inches (3.70 metres)
	J30 to 31	NB	A 241/0	15 foot and 0 inches (4.58 metres)
	J30 to 31	NB	A 244/2	14 foot and 10 inches (4.53 metres)
M25	J24 to 23	Anticlockwise	B 136/7	14 foot and 8 inches (4.47 metres)
	J5 to 6	Clockwise	A 39/0	13 foot and 1 inch (4.00 metres)
M3	J3 to 2	EB	B 38/5	13 foot and 2 inches (4.02 metres)

Table 1 Verified all lane running emergency area widths

3. Widening options

We have carried out more detailed feasibility studies to determine how the three emergency areas on all lane running that measure less than 14 foot 5 inches (4.4 metres) can be widened. The purpose of these assessments was to provide an indication of the construction works required. We also looked at order of magnitude cost estimate and identify any significant constraints (for example land purchase or significant environmental challenges).

Where widening is implemented, more detailed feasibility work will be required to refine the scope, programme and cost estimates on a site by site basis.

3.1 M1 J32 to 33 NB A 253/8

The widening of this emergency area will require significant construction work due to its location in a strengthened rock cutting. Land acquisition will almost certainly be required if the cutting is widened. A summary of the widening solution is provided in Table 2 opposite.

Figure 2 Emergency area M1 J32 to 33 NB A 253/8 © Google

Motorway	Link	Direction	Marker post	Verified average width
M1	J32 to 33	NB	A 253/8	12 foot and 2 inches (3.70 metres)
Current operation		Accident data - a review of safety data since scheme opening (March 2017) shows no personal injury collisions have been attributed to the emergency area. The Stage 4 Road Safety Audit which reviewed one year of post-opening data did not identify any issues with this emergency area. Feedback from our traffic officers is that offside repairs (tyre changes) on large vehicles can sometimes require additional arrangements to be put in place, for example a nearside lane closure. Additional arrangements can also sometimes be required at sites which meet the standard width (15 foot (4.6 metres)).			
Summary of potential solution(s)	Construction works	To achieve a compliant 15 foot (4.6 metres) width we would need to widen a strengthened rock cutting together with relocating roadside assets/features such as drainage, vehicle restraint system, emergency roadside telephone over a length of approximately 110 yards (100 metres). Also constructing a 3 foot 3 inches (1 metre) strip of full depth pavement construction over a length of approximately 55 yards (50 metres).		
	Other	Land acquisition - additional land will almost certainly be required for construction (cutting widening and maintaining a reasonable access to the boundary fence). High voltage overhead electricity cables - in close proximity to the site will complicate construction. The feasibility of an alternative solution to widen the site by moving the safety barrier back but avoiding the need to widen the rock cutting is being investigated.		
Estimated cost	Up to £1.5m (excluding the cost caused by delays to road users during construction)			
Estimated programme	Completed by March 2023			

Table 2 Summary of the widening solution at M1 J32 to 33 NB A 253/8

3.2 M25 J5 to 6 clockwise A 39/0

Retaining the existing narrow footpath while achieving a compliant emergency area width would require extensive construction work due to the need to implement a new sheet pile wall. Such works would also likely impact on adjacent ancient woodland. The proposed option is therefore to widen this emergency area through removal of the existing narrow footpath. A summary of the solution is provided in the table 3 opposite.

Figure 3 Emergency area M25 J5 to 6 clockwise 39/0 © Google

Motorway	Link	Direction	Marker post	Verified average width
M25	J5 to 6	Clockwise	A 39/0	13 foot and 1 inch (4.00 metres)
Current operation		Accident data - a review of STATS 19 data since scheme opening (April 2014), shows no personal injury collisions have been attributed to the emergency area. The Stage 4 Road Safety Audit which reviewed three years of post-opening data also showed no personal injury collisions have been attributed to the emergency area. Feedback from our traffic officers is that offside repairs (tyre changes) on large vehicles can sometimes require additional arrangements to be put in place, for example a nearside lane closure. Additional arrangements can also sometimes be required at sites which meet the standard width (15 foot (4.6 metres)).			
Summary of potential solution(s)	Construction works	It is proposed to remove the existing narrow footpath and provide a new dropped kerb adjacent to the telephone (footpaths are not a standard requirement at emergency areas) and maintain the current barrier position. We will carry out further design work to determine whether to provide a standard width emergency area (15 foot (4.6 metres)) with a slight reduction in set-back to the barrier (1 foot 7.7 inches (0.5 metres) vs standard 1 foot 11.6 inches (0.6 metres)) or a slight reduction in standard emergency area width (14 foot 9.2 inches (4.5 metres)) with standard set-back to the barrier (1 foot 11.6 inches (0.6 metres)). Note - widening the emergency area and retaining a narrow footpath would require the existing sheet pile to be moved back with impacts on adjacent ancient woodland and estimated costs of £1.25 million.			
	Other	Ancient woodland - the area immediately behind the highway boundary is designated as ancient woodland and priority habitat.		
Estimated Cost	£200k to £250k (excluding the cost caused by delays to road users during construction)			
Estimated Programme	Completed by March 2023			

Table 3 Summary of the widening solution M25 J5 to 6 clockwise

3.3 M3 J3 to 2 eastbound B 38/5

The widening of this emergency area would require extensive construction work due to the need to relocate a retaining wall. There are also verge constraints between the emergency area and adjacent local authority road. Due to its location on the inside of a bend, widening may have a negative impact on visibility to and from a vehicle within the emergency area. This may have a detrimental impact on the safe operation of the emergency area. A summary of the widening solution is provided in the table 4 below.

Figure 4 Emergency area M3 J3 to 2 EB B 38/5 © Google

Motorway	Link	Direction	Marker post	Verified average width
M3	J3 to 2	EB	B 38/5	13 foot and 2 inches (4.02 metres)
Current operation		Accident data - a review of STATS 19 data since scheme opening (June 2017) shows no personal injury collisions have been attributed to the emergency area. The stage 4 Road Safety Audit which reviewed one-year of post-opening data also showed no personal injury collisions have been attributed to the emergency area. Feedback from our traffic officers is that offside repairs (tyre changes) on large vehicles can sometimes require additional arrangements to be put in place, for example a nearside lane closure. Additional arrangements can also sometimes be required at sites which meet the standard width (15 foot (4.6 metres)).			
Summary of potential solution(s)	Construction works	To achieve compliant 15 foot (4.6 metres) width would require fully reconstructing the rear of the emergency areas, breaking out all existing assets including combined kerb and drainage, vehicle restraint system, signage, retaining wall and screening fence. These assets would need to be set back approximately 1 foot 11.6 inches (0.6 metres) from their existing position. There is potential for this to be achieved within the footprint of the existing highway boundary, however, the retaining wall would need to be located on the highway boundary with the screening fence mounted directly above. Alterations would also be required to National Roads Telecommunication Services ducts and drainage.			
	Other	Forward visibility to the emergency area, and from within the emergency area for vehicles exiting, needs special consideration due to its location on the inside of a bend. Visibility challenges would be exacerbated by widening the emergency area further into the verge and is a safety concern. Potential adverse impact during construction on the adjacent local authority road.		
Estimated Cost	£2.5m to £3m (excluding the cost caused by delays to road users during construction)			

Table 4 Summary of the widening solution at M3 J3 to 2 EB B 38/5

4. Actions

4.1 All lane running emergency areas

Widening will:

- be implemented at the two narrowest sites (M1 J32 to 33 and M25 J5 to 6)
- not be implemented at the third site (M3 J3 to 2) which is already the widest of the three locations:
  - due to the location of the site, widening is likely to worsen visibility
  - no concerns have been identified with the operation of the existing emergency area
  - existing mitigations are used as required (lane closures, reduced speeds, traffic officer assistance etc)

4.2 Dynamic hard shoulder running emergency areas

We will undertake the following actions as part of the programme to upgrade existing dynamic hard shoulder running sections to all lane running. We will complete the following by end of March 2025:

- confirm the widths with actual site measurements
- determine mitigating actions on those with widths below 14 foot 5 inches (4.4 metres)

Appendices

A1 – References

Table A 1: References

References	
[1]	Smart Motorway Safety Evidence Stocktake and Action Plan
[2]	Specialist Professional and Technical Services (SPATS) Framework Lot 1 & Lot 2 Task 1127 Smart Motorway Incident and Infrastructure Investigation – Emergency Area Width Review

If you need help accessing this or any other Highways England information, please call **0300 123 5000** and we will help you.

This document is also available on our website at **www.highwaysengland.co.uk**

For an accessible version of this publication please call **0300 123 5000** and we will help you.

If you have any enquiries about this publication email **info@highwaysengland.co.uk**
or call **0300 123 5000***. Please quote the Highways England publications code **PR80/21**.

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls.

These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Printed on paper from well-managed forests and other controlled sources when issued directly by Highways England.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ

Highways England Company Limited registered in England and Wales number 09346363