Public Affairs

RAC Response to the Transport Select Committee Inquiry – All Lane Running

ABOUT RAC

This submission is made on behalf of RAC Motoring Services (The RAC) which is the UK's oldest motoring organisation. The RAC offers a range of motoring services including roadside assistance, motor insurance, motoring advice and information and is separate from the RAC Foundation which is a transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to roads and their users.

With more than eight million members, the RAC is one of the UK's most progressive motoring organisations, providing services for both private and business motorists. As such, it is committed to making driving easier, safer, more affordable and more enjoyable for all road users.

The RAC, which employs more than 1,500 patrols, providing roadside assistance across the entire UK road network and as a result has significant insight into how the country's road networks are managed and maintained.

More information on the RAC is available at www.rac.co.uk

COMMITTEE SCOPE

Several "all-lane running" motorway schemes in sections of the M1, M4, M5, M6, M42 and M62 are in operation either as part of a managed motorway or with the hard shoulder used as a full-time running lane. Use of all-lane running looks set to expand and the Transport Committee would like to evaluate the evidence generated to date and gather information on the experiences of road users.

The Transport Committee is particularly interested in receiving evidence on:

- The impact of all-lane running on the safety of motorway users
- The effectiveness of all-lane running in managing capacity and congestion on the Strategic Road Network
- The impact on motorway maintenance
- Incident rates, the management of incidents, vehicle recovery, and the provision of refuge areas where all-lane running is used
- How policy on all-lane running should evolve, whether application of the policy should be expanded, and whether the policy is sustainable
- The implications of the policy for future motorway widening schemes
- The extent to which road users understand and comply with signs where all-lane running is in operation, and the changes that are needed in driver education and behaviour

RAC RESPONSE – SUMMARY:

The RAC warmly welcomes the Transport Select Committee's inquiry into All Lanes Running on smart motorways.

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The RAC welcomes the introduction of Smart Motorways as a cost effective and rapid means of increasing capacity, reducing congestion and potentially improving safety. Evidence on those sections of motorway that have been converted to smart motorway using the dynamic hard shoulder (DHS) configuration, in which the hard shoulder becomes a running lane only in periods when additional capacity is required, suggests that smart motorways deliver the predicted capacity benefits and improved safety.

However the RAC has concerns that a decision has been taken to implement the All Lanes Running (ALR) configuration, in which the hard shoulder is permanently converted to a running lane, on all future smart motorways because:

1. Highways England's own risk assessment predicts that the ALR configuration, whilst marginally safer than a conventional motorway with 3 lanes and a hard shoulder, is less safe than a smart motorway in which the DHS configuration is in operation.

2. Highways England (formerly the Highways Agency) piloted the DHS configuration for a considerable period to establish its safety before adopting this configuration more widely. In contrast, a decision was taken to adopt the ALR configuration more widely before the safety of the ALR configuration has been proven in practical operation. At the time of submitting this evidence, Highways England has still to release any data on the safety performance of the existing stretches of ALR configured smart motorway on the M25 despite the fact that they have been in operation for well over a year.

3. ALR smart motorways are being implemented with emergency refuge areas (ERAs) up to 2.5 km apart whereas in the early implementation of DHS smart motorways, ERAs were spaced at 500-800 metre intervals. The wider spacing of ERAs combined with the inability to reinstate a hard shoulder on ALR smart motorways is likely to increase the risk of a collision when a vehicle breaks down or stops in an emergency.

4. A survey of those RAC members and patrols that have broken down or attended breakdowns on stretches of smart motorway over the last year suggests that those on sections of ALR smart motorway feel more at risk than those on DHS smart motorways (see within full response).

5. Highways England has stretching targets to reduce casualties on the Strategic Road Network over the period of the current Road Investment Strategy and with DHS smart motorways having a proven track record of casualty reduction when compared to a conventional motorway with a hard shoulder, it is difficult to understand why this configuration has been rejected in favour of a configuration for which the risk assessment predicts a smaller casualty reduction.

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RAC – FULL RESPONSE TO SELECT COMMITTEE QUESTIONS:

THE IMPACT OF ALL-LANE RUNNING ON THE SAFETY OF MOTORWAY USERS

The concept of a smart motorways, on which the hard shoulder is used part or all of the time as a running lane, was first introduced in the UK on a section of the M42 in 2005. Sections of other motorways, including the M6 and M1, were converted to smart motorways between 2005 and 2014. All of these used the "Dynamic Hard Shoulder" configuration in which the hard shoulder was only opened up to traffic at times when additional capacity was needed to cope with the volume of traffic. In 2014 the first sections of smart motorway with the All Lanes Running configuration were opened on parts of the M25 and plans for creation of additional stretches of smart motorway within the Roads Investment Strategy are based on implementation of the All Lanes Running configuration.

The key difference between all-lane running (ALR) and the dynamic hard shoulder (DHS) is that the ALR configuration permanently removes the hard shoulder from the section of motorway, with emergency refuge areas spaced at up to every 2.5kms apart as the only safe havens available to a vehicle to stop in an emergency. The dynamic hard shoulder configuration keeps the physical aspects of a hard shoulder but opens and closes this at busy times.

See figure 1 below:

Dynamic Hard Shoulder configuration	All Lanes Running Configuration
 *[IMAGE SOURCE: HIGHWAYS ENGLAND]*	 *[IMAGE SOURCE: HIGHWAYS ENGLAND]*
The hard shoulder is opened up as a regular running lane when the volume of traffic requires this (when there is congestion). This is in use on the M1, M6 and M42.	The hard shoulder is permanently converted to a normal running lane, and road markings that characterise the hard shoulder are removed. This is in use on sections of the North East and South East quadrants of the M25.

Both configurations of Smart Motorways:

- Have variable speed limits
- Have emergency refuge areas
- Are actively monitored using CCTV by Highways England

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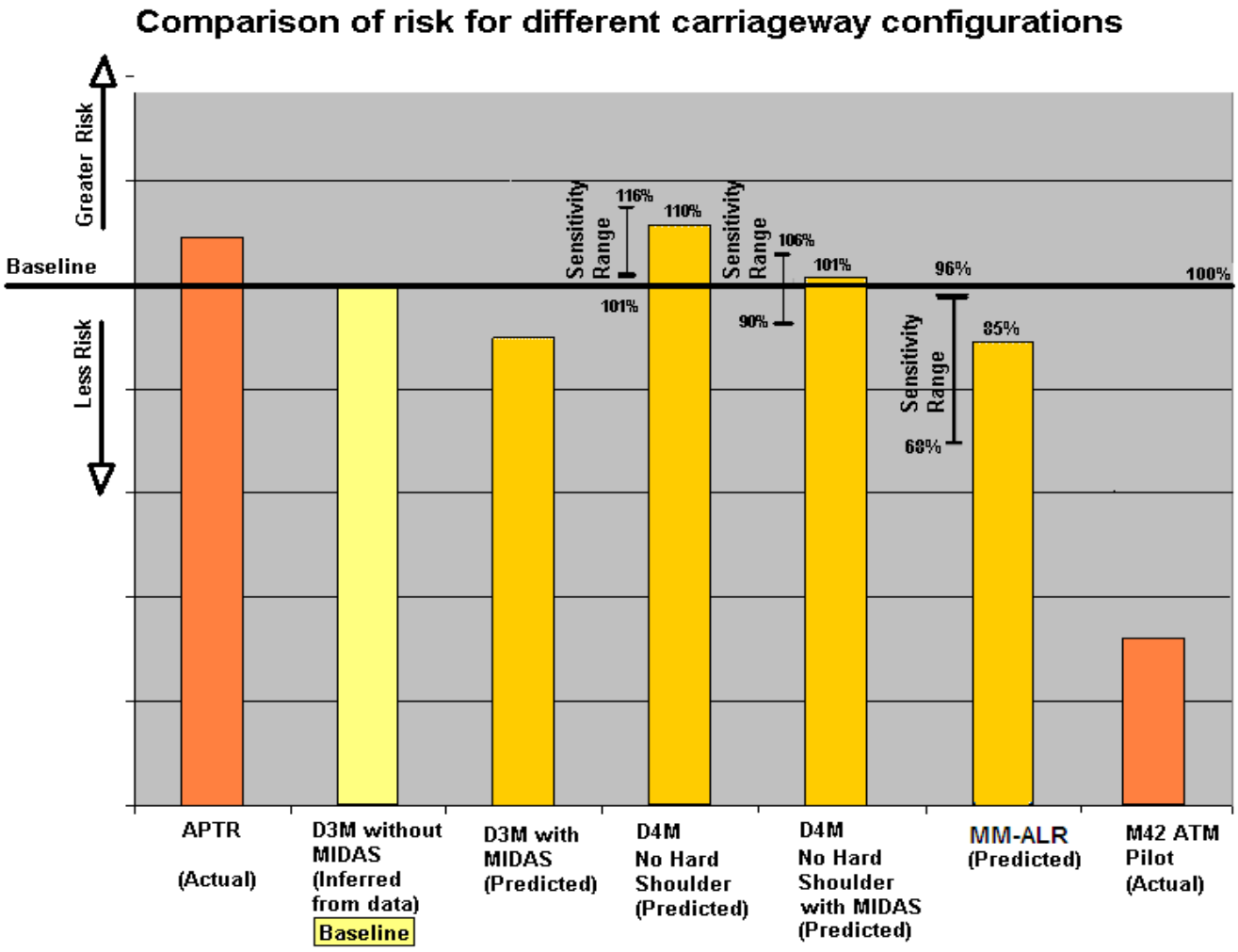
Highways England has published its own assessment of the relative safety of the two design configurations.

- Figure 2 below shows the relative risk associated with various motorway configurations.
- Figure 3 shows an assessment of the risk components for an All Lanes Running configuration and a conventional motorway with 3 running lanes and a permanent hard shoulder. This demonstrates that motorway users are at greater risk when a vehicle breaks down or stops in a running lane for any other reason when compared to a conventional motorway. The risk on an ALR smart motorway is likely to be at its greatest when traffic volumes are low and visibility is poor (e.g. at night) when vehicles travelling at high speeds in Lane 1 are most likely to run into a stationary vehicle that has broken down or stopped in an emergency.

Figure 2:



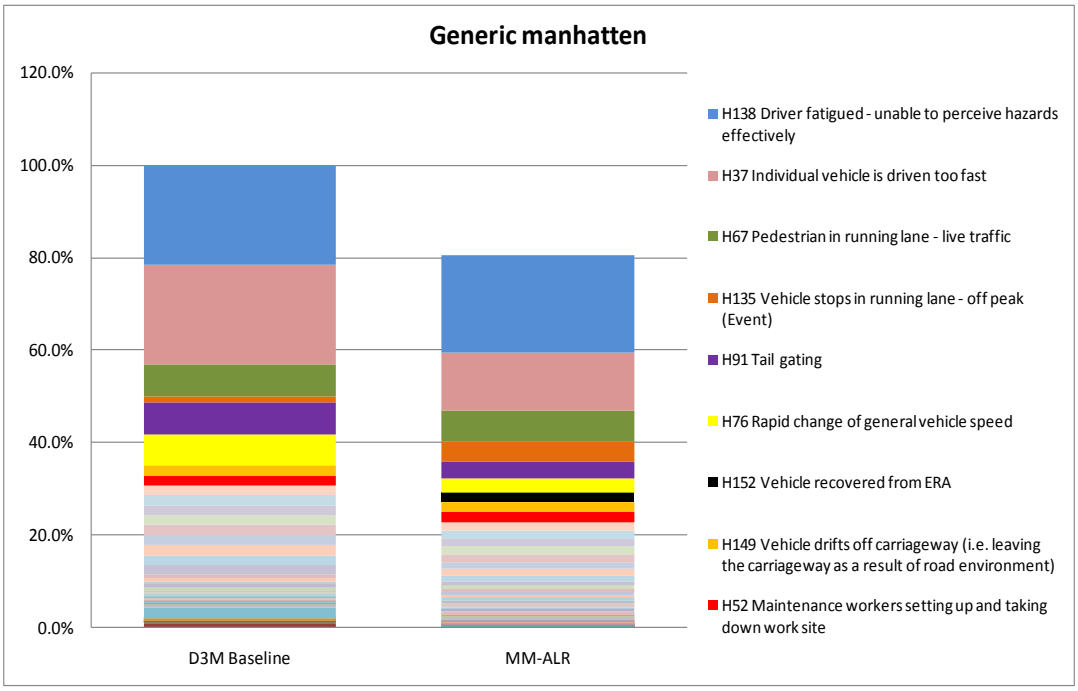
3M without MIDAS is the risk associated with a conventional 3 lane motorway with a hard shoulder

M42 ATM Pilot is the actual risk of the first section of Smart Motorway with the Dynamic Hard Shoulder configuration on the M42

MM-ALR is the predicted risk associated with the All Lanes Running configuration

D3M without MIDAS is the benchmark which equates to a conventional 3 lane motorway with a hard shoulder but without any form of active traffic management

Figure 3:



- The Dynamic Hard Shoulder configuration has been in operation for 10 years and has been shown to be safer than a conventional 3 lane motorway with a hard shoulder. The RAC therefore supports the wider implementation of smart motorways as a rapid and cost effective means of increasing motorway capacity and improving safety. However the RAC has concerns that a decision has already been taken to implement the ALR configuration on all future smart motorways because:
- Highways England's own risk assessment predicts that the ALR, whilst marginally safer than a conventional motorway with 3 lanes and a hard shoulder, is less safe than a smart motorway in which the DHS configuration is in operation.
    - Highways England (formerly the Highways Agency) piloted the DHS configuration for a considerable period to establish its safety before adopting this configuration more widely. In contrast, a decision was taken to adopt the ALR configuration more widely before the safety of the ALR configuration has been proven in practical operation. At the time of submitting this evidence, Highways England has still to release any data on the safety performance of the existing stretches of ALR configured smart motorway on the M25 despite the fact that they have been in operation for well over a year.
    - ALR smart motorways are being implemented with emergency refuge areas (ERAs) up to 2.5 km apart whereas in the early implementation of DHS smart motorways, ERAs were spaced at 500-800 metre intervals. The wider spacing of ERAs combined with the inability to reinstate a hard shoulder on ALR smart motorways is likely to increase the risk of a collision when a vehicle breaks down or stops in an emergency.
    - A survey of those RAC members and patrols that have broken down or attended breakdowns on stretches of smart motorway over the last year suggests that those on

sections of ALR smart motorway feel more at risk than those on DHS smart motorways. (see below).

- Highways England has stretching targets to reduce casualties on the Strategic Road Network over the period of the current Road Investment Strategy and with DHS configured smart motorways having a proven track record of casualty reduction when compared to a conventional motorway with a hard shoulder, it is difficult to understand why this configuration has been rejected in favour of a configuration for which the risk assessment predicts a smaller casualty reduction.

MOTORIST and PATROL RESEARCH

RAC has conducted a survey of its members that have broken down and patrols that have attended breakdowns in the last 12 months on sections of smart motorway on which both the DHS and ALR configurations were in operation. Because of these constraints, the sample sizes are relatively small and therefore the results should be regarded as indicative only. A presentation is attached which reports the findings in full and the following is a summary of the conclusions:

MOTORISTS BREAKING DOWN

- **Those on Dynamic Hard Shoulder (DHS) felt significantly safer in a breakdown situation than those on All Lanes Running (ALR):** Those motorists using ALR averaged 3.9 out of 10 when asked how safe they felt, compared to 5.2 out of 10 for DHS (The scale of 1 to 10 was subjective with 1 equating to "Extremely Unsafe" and 10 to "Extremely Safe".
- **Only a small proportion (1 in 3) of those breaking down on a smart motorway feel as safe as when they broke down on a conventional motorway with a hard shoulder**
- **Awareness of Emergency Refuge Areas is poor:** Only 28% of those on ALR said they could see an ERA when breaking down: 1 in 4 did not realise the ERAs even existed.
- **The gaps between ERAs are too far apart:** When explained what ERAs were, around 80% believed they should be 1km or less apart.
- **There is uncertainty about traffic management measures imposed by Highways England when a breakdown occurs:** One in five of those that broke down were unaware of what traffic management measures were supposed to be imposed to protect the scene when a breakdown occurred.
- **Dynamic Hard Shoulder is more popular than All Lanes Running:** There is a clear preference for more Dynamic Hard Shoulder configuration motorways when asked for a preference between the two. Less than 1 in 10 preferred ALR.
- **A Significant proportion deem a permanent hard shoulder to be extremely important:** 2 in 5 consider a permanent hard shoulder to be 'extremely important'.

PATROLS ATTENDING BREAKDOWNS

- **Feeling safe working on smart motorways:** Patrols feel less safe on smart motorways than on motorways with a permanent hard shoulder - Patrols working on All Lanes Running feel more strongly about this than those working on dynamic hard shoulder.
- **Traffic Management appears to be better on ALR:** Traffic management measures to protect the scene were more likely to be in operation when a patrol arrived at the scene on an ALR configured smart motorway than on a DHS smart motorway suggesting that Highways England are more alert to the risks on ALR motorways.

THE EFFECTIVENESS OF ALL-LANE RUNNING IN MANAGING CAPACITY AND CONGESTION ON THE STRATEGIC ROAD NETWORK

The RAC welcomes the introduction of Smart Motorways as a cost effective and rapid means of increasing capacity, reducing congestion and potentially improving safety. Evidence on those sections of motorway that have been converted to smart motorway suggests that smart motorways deliver the predicted capacity benefits.

For the reasons stated above, however, RAC would prefer to see the DHS configuration adopted until such time as the ALR configuration can be demonstrated to be no less safe than existing DHS smart motorways.

THE IMPACT ON MOTORWAY MAINTENANCE

The RAC is not qualified to discuss impacts on motorway maintenance in any detail. However, the absence of a hard shoulder means that any maintenance may have a bigger impact on motorway capacity and congestion than on a conventional motorway with a hard shoulder where there is a greater opportunity to reconfigure lanes. This emphasises the need for careful planning to minimise disruption which is an area in which the Highways Agency/Highways England has demonstrated considerable expertise and progress in recent years.

INCIDENT RATES, THE MANAGEMENT OF INCIDENTS, VEHICLE RECOVERY, AND THE PROVISION OF REFUGE AREAS WHERE ALL-LANE RUNNING IS USED

The RAC has no data that suggests differences in the propensity to break down on different configurations of motorway (conventional, DHS smart, ALR smart). However the RAC acknowledges that motorway users are more likely to stop in a non-emergency situation on a hard shoulder or in an ERA if these are present.

Emergency Refuge Areas (ERAs) provide a safe haven in which a vehicle can stop in an emergency to avoid having to stop in a running lane. They are a feature of both the DHS and ALR smart motorways. Early implementations of the DHS configurations had ERAs spaced at 500-800 metre intervals so that a motorists braking down normally had an ERA in line of sight.

The Emergency Refuge Areas provided on the ALR sections of the M25 are spaced at intervals of up to every 2.5kms. Motorists will therefore see a huge variation in the provision of ERAs depending on the stretch of smart motorway on which they are travelling. This is reflected in our survey results in response to a question about awareness of ERAs. On the ALR sections of the M25, only 42% of motorists who broke down were aware that ERAs existed, whilst only a meagre 28% could see an

ERA from where they broke down. This compares unfavourably to the DHS sections of the M42, M1 and M6 where 56% were aware of the ERAs and 40% could see an ERA when they broke down. The RAC believes it should be of great concern to Highways England, DfT and indeed all stake holders that awareness of the existence of ERAs is so low, particularly given the low probability of a motorist breaking down having an ERA in line-of-sight.

A number of patrols informed us in our survey that ERAs are too short and that it is difficult to safely recover a vehicle from an ERA because there is insufficient room to accelerate to join a running lane safely. Recovery of a heavy goods vehicle from an ERA is even more difficult and cannot be achieved safely without closure of the inside lane on an ALR smart motorway or the hard shoulder on a DHS smart motorway.

HOW POLICY ON ALL-LANE RUNNING SHOULD EVOLVE, WHETHER APPLICATION OF THE POLICY SHOULD BE EXPANDED, AND WHETHER THE POLICY IS SUSTAINABLE

Given Highways England's own risk assessment, the RAC would prefer to see the roll-out of smart motorways based on the DHS configuration until such time as ALR is proven to be no less safe than DHS. We believe that this represents the safest way to upgrade the motorway network. We recognise that Highways England claim that DHS is a more expensive configuration to operate, but we believe that the retention of the ability to reinstate a hard shoulder provides reassurance for both motorists and patrols.

Should ALR continue to be the preferred configuration, there are a number of ways that ALR could evolve to both reduce risk and awareness and we would urge Highways England to consider the following:

- Increase the number of Emergency Refuge Areas. Only 22% of those we surveyed believe that gaps of more than 1km between ERAs on smart motorways is acceptable, whilst only 42% of motorists who broke down on a smart motorway section managed to reach the ERA. We therefore regard a spacing of up to 2.5km to be too great.
- Raise awareness of the existence of ERAs and signage to indicate the distance to the next ERA.
- Increase awareness of the importance of compliance with the 'Red X', lane closure signs. There has been positive work done by Highways England on this over the last 6 months but there remains a worrying minority of drivers who ignore red 'X' signs.
- There remain some sections of the smart motorway that are not fully monitored by CCTV cameras, although this represents only 5%[1]. With ALR set to become the default configuration, this potentially exposes miles of upgraded ALR smart motorways without

[1] http://assets.highways.gov.uk/our-road-network/managing-our-roads/managed-motorways/S130457_Smart%20motorways%20interactive%20ezine%20-%20Update%20-%20What%20you'll%20see.pdf

CCTV coverage. The RAC would like to see coverage increased to 100% on ALR smart motorways.

- The RAC urges greater transparency on the part of Highways England so that data on the performance of smart motorways is made available quarterly.

THE IMPLICATIONS OF THE POLICY FOR FUTURE MOTORWAY WIDENING SCHEMES

As stated earlier, the RAC supports the introduction of further sections of smart motorway to increase capacity, reduce congestion and potentially to improve safety. However, the RAC urges caution in the adoption of the ALR configuration until such time as it is proven to be no less safe than the DHS configuration.

THE EXTENT TO WHICH ROAD USERS UNDERSTAND AND COMPLY WITH SIGNS WHERE ALL-LANE RUNNING IS IN OPERATION, AND THE CHANGES THAT ARE NEEDED IN DRIVER EDUCATION AND BEHAVIOUR

According the RAC's survey of motorists who have broken down on sections of existing smart motorway, only 1 in 5 (21%) knew what traffic management measures to protect the scene of breakdown should be initiated by Highways England. One in four confirmed in the survey that they 'weren't sure what they were supposed to do' in the event of a breakdowns.

There is acceptance that motorists generally comply with signage that closes the hard shoulder to traffic on DHS smart motorways but that compliance is poorer on ALR smart motorway when Highways England attempt to close a lane using red 'X' signs on overhead and verge mounted variable message signs.

The RAC welcomes recent proposals by the Government to allow learner drivers to receive instruction and to practice under the supervision of an approved instructor on motorways before taking their practical test. As further smart motorways are rolled out across the network, it will be increasingly important that new drivers learn how to drive on these in a way that minimise risk both to themselves and other road users.

Please address any comments or further contact to:

David Bizley, RAC Chief Engineer dbizley@rac.co.uk

Pete Williams, RAC Head of External Affairs peter.williams@rac.co.uk

Nicholas Lyes, RAC Public Affairs Manager nlyes@rac.co.uk

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