RAC PUBLIC AFFAIRS

WRITTEN REPRESENTATION

HIGHWAY ENGLAND'S RESPONSE

1. ABOUT THE RAC

1.1 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.

1.2 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.

1.3 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.

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

2. DESIGN OF SMART MOTORWAYS

Configuration Options

2.1 The RAC is supportive of the current use and expansion of Smart Motorways across the Strategic Road Network (SRN) as part of the Government's Road Investment Strategy.

2.2 *RAC believes that smart motorways will both help alleviate congestion and assist in controlling the flow of traffic, making journeys for road users more reliable and expanding capacity to some of the most congested stretches of motorway. They offer a cost effect solution that minimises environmental impact and have the potential to improve the safety of users of the motorways concerned.*

2.3 We are supportive of the use of the Dynamic Hard Shoulder configuration, which opens up the hard shoulder to traffic during busy times and is currently in use in sections of the M42,

M6, and M1, and has a proven record of improved road user safety. However, we are concerned that All Lanes Running configuration in which the hard shoulder is permanently turned into a running lane and where Emergency Refuge Areas are spaced at up to 2.5kms apart will not deliver the road safety benefits of the Dynamic Hard shoulder configuration. Characteristics of the two configurations are summarised 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 regular 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.

2.4 Both configurations of Smart Motorways:

(i) Have variable speed limits

(ii) Have emergency refuge areas

(iii) Are actively monitored using saturation CCTV by Highways England.

Highways England Comment

2.4.1 Highways England note the RAC's support of the Dynamic Hard Shoulder configuration (also known as Hard Shoulder Running ("HSR")). The All Lane Running (ALR) concept is now Highways England policy and is the preferred operating regime to manage congestion on the network for the reasons set out below.

2.4.2 The safety benefits of a HSR scheme are noted. In order to address the issues related to operating and maintaining an HSR scheme, as outlined above, the Highways Agency (now Highways England) developed a revised smart motorway concept based upon the permanent conversion of the hard shoulder to a running lane, using the knowledge and experience gained from constructing and operating the M42 Pilot (a HSR scheme) and Birmingham Box schemes. The aim was to optimise the quantity of infrastructure required to operate the motorway safely without the hard shoulder (i.e. an ALR scheme), whilst continuing to deliver schemes that tackled the problem of growing congestion and unreliable journeys. This optimised approach required fewer overhead gantries and made greater use of cantilever gantries to present information to drivers in a simpler way, whilst minimising the whole of life cost of expensive infrastructure. These efficiencies have made it possible to deliver a far greater number of smart motorway carriageway miles and deliver significant benefits more quickly than would have been possible by replicating the more heavily engineered M42 pilot scheme.

2.4.3 Although the level of safety benefit for ALR is not as significant as that seen on, or expected for HSR schemes, the level of safety benefit meets the Scheme's safety objective (as set out in section 2.3 ‘Safety baseline and objectives’ of the Hazard Log Report (Annex E of the Engineering and Design Report (Application Document Reference 7.4)) and still provides a safety benefit when compared to the current (baseline) configuration. ALR also provides substantial cost savings when compared to constructing and operating HSR. The permanent conversion of the hard shoulder maximises the use of the space available, removes the risks introduced by the part time use of the hard shoulder and reduces the amount of information the road user has to assimilate from the overhead signs and signals. It removes also the need for the complex and resource intensive operating systems to “open” and “close” the hard shoulder, and reduces the incumbent maintenance requirements.

2.4.4 The Scheme is expected to provide a safety benefit similar to the 18% expected of a generic ALR scheme compared to a generic baseline. The original smart motorway design (the M42 Pilot) operated with a HSR operating regime. The M42 Pilot suggests a 60% reduction in safety risk compared to the baseline (reference Annex E of the Engineering and Design Report ("EDR") (Application

Document Reference Number 7.4)). However, the M42 Pilot was more costly, more visually intrusive, more resource intensive and provided less journey time benefits than the design proposed for the Scheme. It also has been found to have a number of potential technology points of failure, which means that the hard shoulder cannot be opened to traffic on occasion. For example, the opening of the hard shoulder as a running lane on a HSR scheme for safety reasons requires all hard shoulder lane signals to be available. When a hard shoulder lane signal develops a critical technology fault then the operator cannot open the hard shoulder to traffic. Alternatively, as there is a requirement for the operator to be able to view the full length of hard shoulder, should a hard shoulder camera develop a fault where the operator cannot view a section of hard shoulder (either through a hard shoulder camera or a Pan-Tilt-Zoom camera) then the operator will not open the hard shoulder to traffic. Furthermore, this results in a high maintenance burden which itself results Highways England's workforce being exposed to greater risk. All of these factors impact on the financial and operational benefits of managed motorways.

2.4.5 Although there are differences between the original HSR design and the Scheme design, the hazard log assessment work undertaken has shown that the Scheme should not compromise overall safety. It is also noted that although the original M42 Pilot scheme showed a reduction in risk of 60%, other HSR schemes introduced do not show the same level of benefit. For example, the HSR scheme on M6 J5-6 is expected to provide reduction in risk of approximately 36% (in Personal Injury Accidents). This is due to the experience from the M42 Pilot which led to optimising the operation and design of the Smart Motorways concept and meant that equipment and infrastructure could be located at greater spacing than the original design.

2.4.6 There is a requirement to confirm that safety will be made ‘no worse’ than the baseline across all populations by the introduction of the Scheme (see ALR generic safety report, Ref: 1039092-GSR-016, section 4.1.2 Road user safety objective). The safety baseline and objective is explained within the Hazard Log Report at section 2.3 (Annex E of the Engineering and Design Report (Application Document Reference 7.4)).

2.4.7 The safety baseline for smart motorways is the accident rate on the section of motorway before the installation of motorway incident detection and automatic

signalling ("MIDAS") as stated in Section 2.3 of the Hazard Log Report (Annex E to the Engineering and Design Report (Application Document Reference 7.4)). The M4 between junctions 3 and 12 already has MIDAS installed. The assumed MIDAS safety benefit is 10%. Therefore, in order to represent the M4 without MIDAS, to show the safety baseline, the current three year average accident rate is increased by 10% to account for the benefits of MIDAS (see ALR generic safety report, Ref: 1039092-GSR-016, section 4.1.1 Safety baseline).

2.4.8 Section 5.2.78 of the Planning Statement (Application Document Reference 7.1) explains that the calculations from the hazard analysis work show that the total score given in relation to the period after construction of the Scheme represents a reduction of risk of approximately 18% in comparison to the safety baseline (with no MIDAS queue protection). Even when the additional safety benefit of 10% above the baseline with MIDAS is taken into account, the Scheme would still expect to see a reduction in risk of approximately 8%.

2.4.9 With regards to the spacing of emergency refuge areas ("ERAs"), this Scheme has an average spacing between refuges will be 1.14 miles (1.85km) as detailed in section 2.2 of Annex E of the EDR (Application Document Reference Number 7.4), which is significantly within the 2.5km maximum spacing outlined with the smart motorways ALR design standard (Interim Advice Note("IAN") 161/13). Evidence supporting IAN 161/13 – 'An Evaluation of the provision of refuge area' reinforces the view that many road users will still be able to make it to a refuge area in an emergency, even when the distance is increased. (Ref: http://assets.highways.gov.uk/specialist-information/knowledge-compendium/2011-13-knowledge-programme/MM-ALR_Evaluation_of_the_Provision_of_Refuge_Areas.pdf).

2.4.10 With regards to the RAC's concern about the ALR configuration not delivering road safety benefits, the extra controls provided through smart motorway features will be able to support the identification of vehicles in the live lane. The use of full closed circuit television ("CCTV") coverage to find vehicles will allow quicker identification of vehicles in a live lane, potentially the nature of the incident (such as breakdown) and allow emergency resources to be dispatched in a timely manner. The management of an incident including access by emergency vehicles is outlined in paragraph 9.4.5 of the Engineering and Design Report ("EDR") (Application Document Reference Number 7.3). As is currently the case

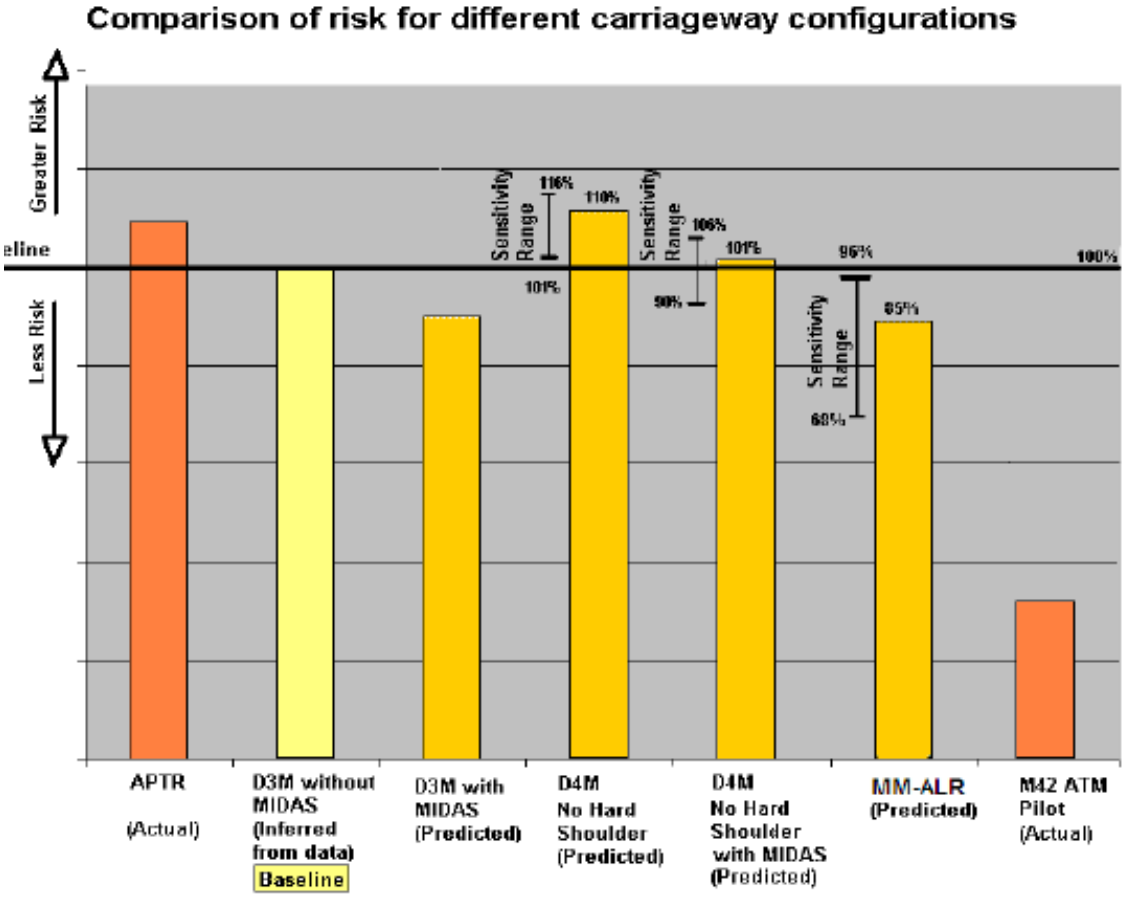
on smart motorways, Highways England will be able to create an emergency lane/s (in any lane on the motorway) by managing traffic with signs and signals to provide access for the emergency services or traffic officers. Signs and signals will set either a lane 1 or lane 4 closure to create an incident access lane for emergency services. If it were not possible to reach the incident in the same direction of traffic, safe operating procedures are in place so that access can be provided from the opposite direction if necessary. For road users, speed limits and lane availability will be indicated through the use of variable message signs ("VMS") using lane divert arrow signals (to divert traffic) and Red 'X' signals (for lane closures). This is stated in paragraph 10.3.16 of the EDR (Application Document Reference 7.3).

Risk Assessments

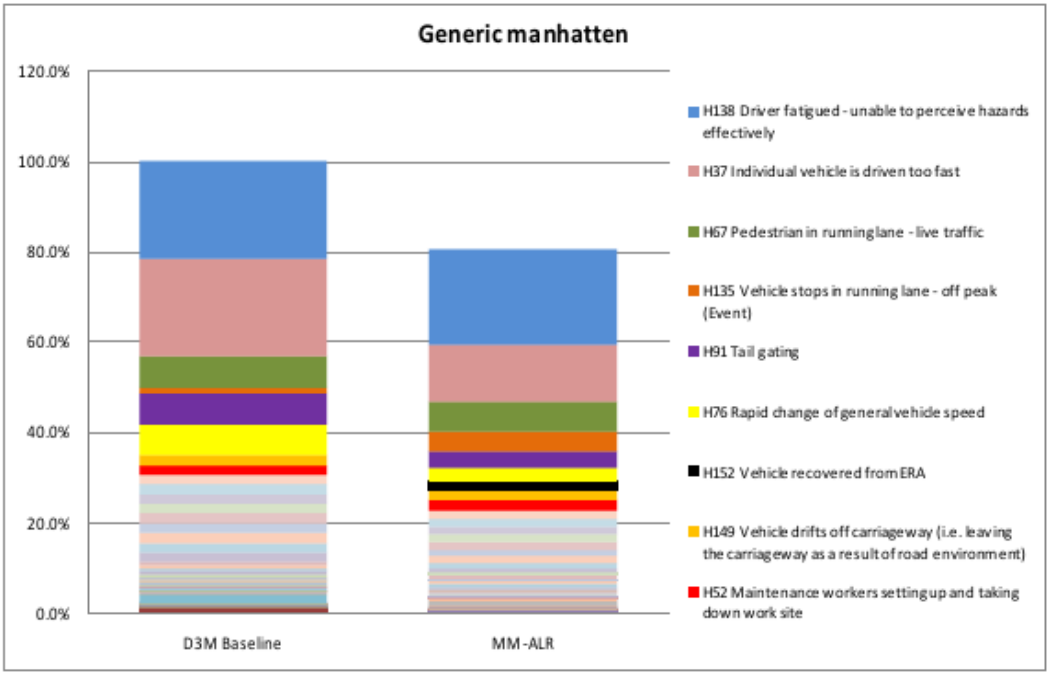
2.5 Highways England have published their own assessment of the relative safety of the two design configurations.

(i) The first illustration below shows the relative risk associated with various motorway configurations.

(ii) The second illustrations shows a breakdown 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 compared to a conventional motorway.



- *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*



Highways England Comment

2.5.2 The first illustration in the representation above shows the relative risk associated with various motorway configurations. It shows that the ALR concept is expected to provide a similar level of safety benefit to a dual three lane motorway (D3M) with MIDAS, and both configurations provide a safety benefit when compared to the baseline. It also shows that the M42 Pilot provides the greatest reduction in risk compared with the other motorway configurations.

2.5.3 The first illustration above has been updated based on further analysis by Highways England in Figure 1 below to show that a generic ALR scheme is expected to provide a safety benefit of 18% when compared to a generic baseline (a D3M without MIDAS). It shows that the Scheme is expected to provide a similar safety benefit of 18% to that experienced with a generic ALR scheme compared to a generic baseline. It also shows that the Scheme is expected to provide an 8% reduction in risk when compared to the existing M4 motorway (D3M with MIDAS).

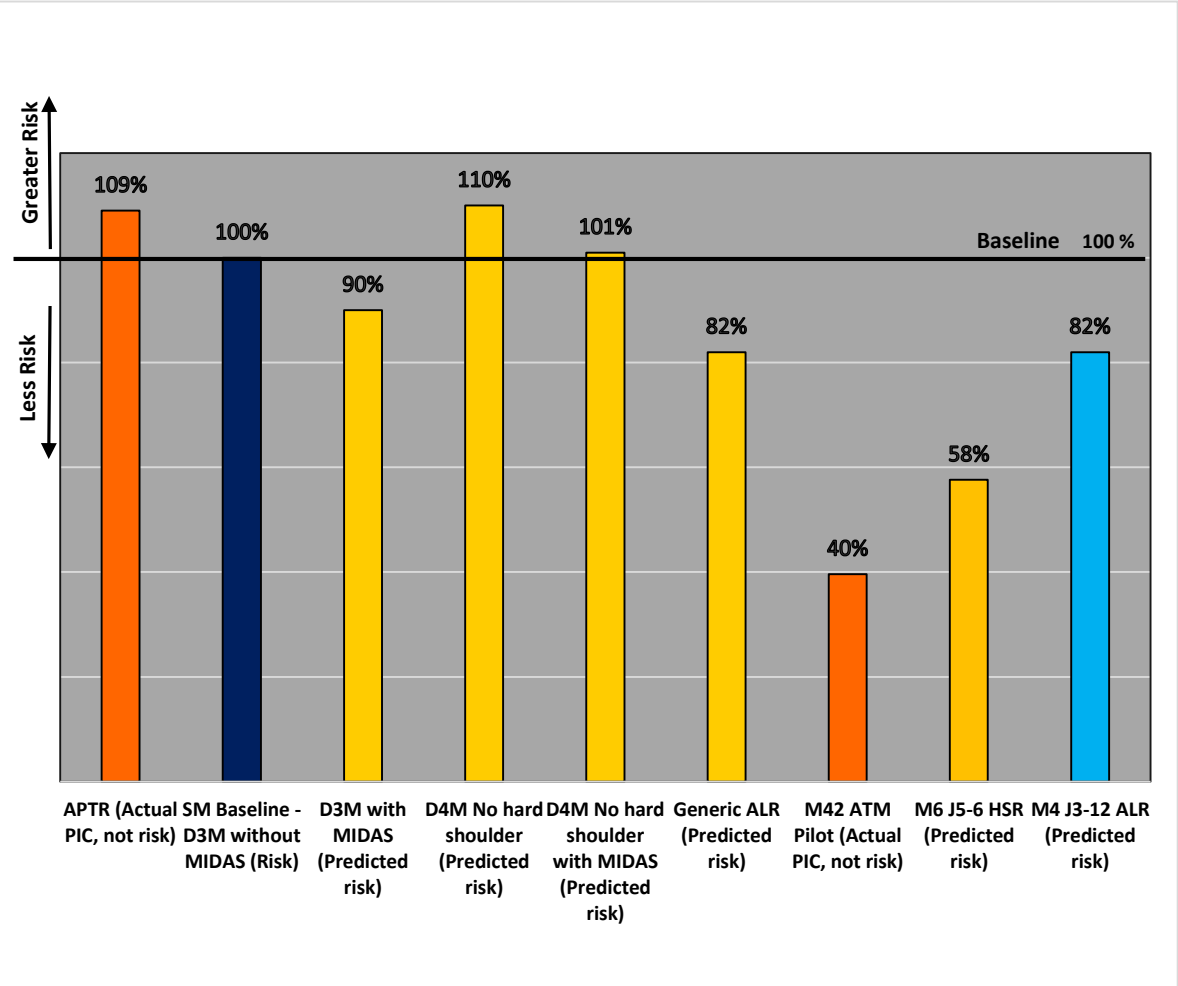


Figure 1: Updated comparison of risk for different carriageway conditions

2.5.4 The M42 Pilot introduced a new way of operating the network, where the hard shoulder was opened to traffic as a running lane during peak periods for the first time. An overriding priority for that scheme was to demonstrate to road users and broader stakeholders that the hard shoulder could be operated safely as a running lane in order to tackle congestion. Given the pilot nature of the scheme, a conservative approach was taken during the safety assessment and the design of the scheme to prove that the motorway could be operated at least as safely as a standard three lane motorway. This resulted in a high density of infrastructure such as overhead gantries with variable speed limit lane signals and a high frequency of emergency refuge areas (nominally at 500m spacing) for road users to use in the case of an emergency to manage the new environment. The pilot scheme demonstrated that the hard shoulder can be operated safely as a traffic

lane to manage congestion, whilst also delivering a significant overall safety improvement. The M42 pilot delivered a very large safety margin between the scheme performance and the safety performance of a standard three lane motorway. As noted in Highways England's responses above, the experience gained from the M42 Pilot led to the optimisation of the operation and design and meant that equipment and infrastructure could be located at greater spacing than the original design, without compromising safety or the benefits for traffic flow. The optimisation was driven by a need to address the operating issues that arose and are described in paragraph **Error! Reference source not found.** above.

2.5.5 The second illustration in the representation above provides a breakdown of the risk components for an All Lanes running configuration and a conventional motorway with 3 running lanes and a permanent hard shoulder. The hazard log for the Scheme is based upon the generic hazard log and is summarised below.

2.5.6 As per the generic hazard log the Scheme's hazard log contains the 17 highest scoring existing motorway hazards (i.e. those with a risk score of E08/S08 and above). Thirteen of these are expected to reduce in risk with the implementation of ALR, two are expected to remain the same and two are expected to increase in risk. The hazards referenced in the question are the two hazards expected to increase in risk with the implementation of ALR:

- H135 Vehicle stops in running lane - Off peak, which is estimated to increase in risk from an E07.50 to an E08.00, and
- H149 Vehicle drifts off carriageway (i.e. leaving the carriageway as a result of the road environment), which is estimated to increase in risk from an E08.00 to an E08.10.

2.5.7 The two highest scoring hazards both before and after implementation of the ALR Scheme are:

- 'Individual vehicle is driven too fast', and
- 'Driver fatigued - unable to perceive hazards effectively'.

2.5.8 The second illustration above shows that there is an increase in risk of the hazard relating to vehicles stopping in a live lane (off peak). To mitigate against this,

ALR schemes introduce control measures in the form of a controlled environment using Variable Mandatory Speed Limits ("VMSL") and CCTV.

2.5.9 With regard to the comment that motorway users are at greater risk when a vehicle breaks down or stops in a running lane for any other reason compared to a conventional motorway, as outlined above, the hazard for a vehicle stopping in a live lane increases. However, we have control measures in place to mitigate against this risk (e.g. as noted above, the implementation of a controlled environment). On the unfortunate occasions when a vehicle does stop in a live lane we can protect the vehicle and the surrounding area through the setting of signs and signals and the use of the full CCTV coverage to manage efficient responses to incidents. Most of the current motorway risks are expected to reduce as a result of the implementation of all lane running (see paragraph 10.3.6 of the EDR (Application Document Reference Number 7.4)) more than compensating for an increase in risk for stopping in a live lane.

2.5.10 It is also noted that the risk from stopping on a hard shoulder is eliminated from an ALR scheme (with the exception of where the hard shoulder is retained through the junctions at J10 and 4b and at the scheme extents). This includes vehicles who stop on a hard shoulder illegally, as well as those who stop for a breakdown when they could exit the motorway. In addition a lot of other hazards will be mitigated through the introduction of the Scheme and overall the risk with ALR is expected to be no worse than the baseline.

2.5.11 The hazard log report states that "Calculations show that the total score for 'after' represents approximately a reduction of risk of 18% when compared with the safety baseline (no motorway incident detection and automatic signalling ("MIDAS") queue protection)." It is noted that when comparing the predicted reduction in risk with the actual M4 J3-12 motorway with MIDAS (10% safety benefit compared to the baseline) the Scheme would still expect to see a reduction in risk of approximately 8%.

Highways England preferred configuration for future Smart Motorways

2.6 Highways England have indicated that their choice of the All Lanes Running configuration is based on 3 main considerations:

(i) The All Lanes Running configuration is less expensive to operate because there is no requirement to open or close the hard shoulder to traffic when traffic volumes increase or fall.

(ii) The All Lanes Running configuration is slightly cheaper to construct

(iii) A Smart Motorway with the All Lanes Running configuration is no less safe than a conventional 3 lane motorway with a hard shoulder.

2.7 The RAC does not dispute the above. However, RAC Patrols indicate that when Highways England closes a running lane by displaying red X signs above the running lane when a vehicle breaks down or stops for another reason, compliance is poor compared with when Highways England closes the hard shoulder to traffic on a Dynamic Hard Shoulder Smart motorway.

Highways England Comment

2.7.1 Highways England agrees that the three main considerations listed above are important aspects of the decision to implement ALR schemes, but for the avoidance of doubt, other criteria, such as smoothing traffic flows and effectiveness in tackling congestion are also important considerations.

2.7.2 The representation makes a comparison between red X compliance when a running lane is closed for incident management and when the hard shoulder is closed to traffic on an HSR scheme. The two red X's used are different, and serve different purposes and it is not possible to make a fair comparison with regard to levels of compliance. A red X over the hard shoulder (Traffic Signs Regulations and General Directions ("TSRGD") 2002 diagram 5003.1) on an HSR scheme does not have flashing lanterns and is not an enforceable sign. It is only used to reinforce that the hard shoulder is not available as a running lane. A red X used on HSR and ALR schemes during incident management is a red X sign with flashing lanterns (TSRGD 2002 diagram 6031.1). It is an enforceable sign and drivers face prosecution should they not comply with the signal.

2.7.3 Whilst it is an offence not to comply with a red X signal (prosecution takes place under Section 36 of the Road Traffic Act 1988, pursuant to the Traffic Signs Regulations and General Directions (2002)), non-compliance with the Red X signal has been recognised as an issue in relation to which Highways England has

undertaken significant work to improve compliance across the network, as detailed below. Highways England is working to provide enhanced enforcement for non-compliance with the red X signal.

2.7.4 Highways England is currently working with the Department for Transport and the Home Office to make a number of legislative changes so that an automated system can be used to enforce the red X signal. Automated enforcement is expected to be available by summer 2016 and is therefore likely to be in place by the time the Scheme commences operation in 2022. A number of police forces across the country have already undertaken on-road enforcement of the offence related to non-compliance with a red X signal and Highways England is continuing to engage with police services in England to promote the enforcement of red X non-compliance through the use of mobile patrols. In the interim period, before an automated system is available, a traditional police enforcement process will be adopted.

2.8 A survey of RAC members who have broken down on Dynamic Hard Shoulder and All Lanes Running Smart Motorways also confirms that those breaking down on the All Lanes Running configuration felt more threatened than those who broke down on the Dynamic Hard Shoulder configuration

2.9 Eighty four per cent of drivers surveyed by the RAC felt that the hard shoulder was important in breakdown and accident situations and 82% said they would feel 'very concerned' if they broke down in lane one – formerly the hard shoulder – of a four lane/all-lane running section of motorway.

Highways England Comment

2.9.1 Highways England notes the survey undertaken of RAC members who have broken down on DHS and ALR schemes. Highways England recognises that the education of road users in relation to how they should behave in an ALR environment is key to the operation of ALR schemes.

2.9.2 Most vehicles that breakdown are able to come to a halt in one of the Emergency Refuge Areas ("ERAs"), which are provided at a maximum distance of 2.5km along the length of the Scheme. However, some broken down vehicles will not be capable of driving to an ERA and will come to a stop in a live running lane. The extra controls provided through smart motorway features will mitigate this risk,

for instance by being able to support the identification of vehicles through the queue protection system, use of full CCTV coverage to locate broken down vehicles and provide details of the location to emergency response staff and the ability to set lane closures in any lane using signs and signals to protect stranded vehicles until help arrives. This guidance is in line with the information presented at the public information exhibitions which covered a number of themes considered likely to be of interest to the community. Information about how to react in the event of a break down is stated in Annex 6 of the Consultation Report (Application Document Reference Number 5.2).

2.9.3 In the event that a vehicle is breaking down, and can drive into an ERA, signing in the ERA instructs drivers to contact the Regional Control Centre ("RCC") using the emergency telephone located at each ERA. The RCC will offer safety advice and ask if the driver requires assistance. Operators in the RCC will be able to monitor the vehicle using CCTV, and if necessary dispatch a traffic officer patrol and/or set signs and signals to assist the vehicle's safe exit, either under the vehicle's own power or under tow from a recovery agent, in line with procedures that have been used on hard shoulder running sections since 2006. Paragraph 6.3.15 of the EDR (Application Document Reference 7.3) gives an overview of the guidance and procedures to assist vehicles exiting out of ERAs.

Emergency Refuge Are*as*

2.10 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 dynamic hard shoulder and All Lanes Running configurations. Early implementations of the Dynamic Hard Shoulder configurations had ERAs spaced at 500-800 metre intervals so that a motorists braking down normally had an ERA in line of sight. More recent designs have extended the distance between ERAs.

2.11 Highways England has indicated that Emergency Refuge Areas (ERAs) will be spaced no more than 2.5kms apart on future Smart Motorways, which RAC believes is too big because someone breaking down or needing to stop in an emergency is unlikely to have an ERA in line of sight so is more likely to stop in a running lane. Evidence suggests that on some sections of the M25 where the 'all lanes running' configuration is in use, distances between ERAs are, in places, greater than 2.5kms apart.

Scheme	M25 J23 - 27	M25 J23 - 27	M25 J5 - 27	M25 J5 - 27
Direction	Clockwise	Anticlockwise	Clockwise	Anticlockwise
Refuge area spacings (m)	2,365 2,400 2,435 2,380 2,645 2,445 2,280 1,490	590 2,385 2,315 2,420 1,770 1,500 1,845 2,360 2,500 590	1,990 2,560 2,067 1,925 1,000 2,450 2,285	1,275 2,475 1,530 1,515 2,265 2,570 1,740
Total scheme length (m)	18,440	18,275	14,277	13,370
Maximum spacing (m)	2,645	2,500	2,560	2,570
Minimum spacing (m)	1,490	590	1,000	1,275
Average spacing (m)	2,305	1,828	2,040	1,910

Highways England Comment

2.11.1 This Scheme has an average spacing between ERAs of 1.14 miles (1.85km) as detailed in section 2.2 of Annex E of the EDR (Application Document Reference Number 7.4). This is significantly within the 2.5km maximum spacing outlined with the smart motorways ALR design standard (Interim Advice Note("IAN") 161/13). During the design of the M42 Pilot, a decision was taken to provide ERAs more frequently (than the guidance outlined within IAN 161/13) due to the need to demonstrate to road users and broader stakeholders that the hard shoulder could be operated safely as a running lane in order to tackle congestion. However,

through analysis of the operation of M42 Pilot and subsequent HSR schemes, guidance has been relaxed on the required spacing which has led to the 2.5km maximum spacing outlined within the smart motorways ALR design standard (Interim Advice Note ("IAN") 161/13).

2.11.2 Evidence supporting IAN 161/13 – 'An Evaluation of the provision of refuge area' reinforces the view that many road users will still be able to drive to a an ERA in an emergency, even if the distance is increased from the early Smart Motorway schemes, where ERAs were located at nominal spacing of 500m on the M42 Pilot and nominal spacing of 800m on other HSR schemes. (Ref: http://assets.highways.gov.uk/specialist-information/knowledge-compendium/2011-13-knowledge-programme/MM-ALR_Evaluation_of_the_Provision_of_Refuge_Areas.pdf).

2.11.3 IAN 161/13 – 'An Evaluation of the provision of refuge area' refers to the Birmingham Box Phase 3 Managed Motorways scheme where there is a considerable gap between areas of refuge (at approximately 3km) over the Bromford Viaduct section of the scheme. The breakdown rate for the Bromford Viaduct section is particularly low (well below the National Average), indicating that, when necessary, or when a location is deemed undesirable for motorists to stop, it is possible for vehicles to continue to a place perceived to be more safe to stop. The report notes the evidence from the Bromford Viaduct supports the view that many drivers are able to nurse a broken down vehicle up to a few kilometres distance before stopping (avoiding stopping in carriageway locations where drivers perhaps perceive themselves to be vulnerable).

2.11.4 Although the risk of live lane stoppages increases with ALR, Highways England have control measures in place to mitigate against this risk, for example the implementation of a controlled environment through VMSL and the setting of signs and signals with the use of the full CCTV coverage as described previously. Consequently most of the current motorway risks are expected to reduce as a result of the implementation of all lane running (see paragraph 10.3.6 of the EDR (Application Document Reference 7.3)) more than compensating for the perceived increase in risk for stopping in a live lane.

2.11.5 It is also the case that it is expected that the frequency of breakdowns in running lanes will be substantially less than the existing frequency of breakdowns on the

hard shoulder, as a significant proportion of breakdowns will be able to get to an ERA. The M42 Pilot found breakdowns approximately halved as detailed in 9.4.4 of the EDR (Application Document Reference 7.3).

2.12 There are three refuge areas which slightly exceed the 2,500m spacing. According to Highways England "these were positioned in order to maximise their visibility to drivers and to avoid locations where significant lane-changing takes place, such as close to junctions. In each case, the solution was approved by the relevant Project Safety Control Review Group."

Highways England Comment

2.12.1 Highways England confirms that although the average spacing of ERAs on the Scheme is significantly under 2.5km spacing (1.85km), there is one location which slightly exceeds the 2.5km - not three as suggested in the representation. This is between the eastbound junction 8/9 diverge and ERA E6-B2 (Reference Sheet 17 and 18 of the Works Plans - Application Document Reference 2.3)

2.12.2 The distance between the ERAs is 2630m, i.e. 130m over the 2.5km spacing. The ERA has been located on a straight section of motorway, in advance of a long sweeping left hand curve that compromises the distance in which to see the ERA and stop safely. In order to provide for an ERA within 2500m, and achieve a safe stopping distance, widening of up to 5.5m would be required in the verge to provide sufficient sight distance. This would require unnecessary widening and clearance of vegetation and would not be expected to provide any greater operating benefits. The spacing is only slightly above the maximum of 2500m and it is considered by Highways England that it is more important on safety grounds to provide an ERA with good visibility for entry and exit than to meet the required standard for the spacing of the ERAs, which is, after all, an imposed standard for safety reasons. The level of visibility would be reduced should the ERA be located at another location. The spacing of ERAs on the M4 J3-12 has also been endorsed by a Project Safety Control Review Group on 5th February 2015 (the minutes of which are provided at Appendix A to this representation).

3. M4 PROPOSAL

3.1 The RAC is not opposing the conversion of converting this section of the M4 into a Smart Motorway. We recognise that this is a heavily congested section of the motorway and as such there is a strong case for increasing capacity to reduce congestion and improve safety.

Highways England Comment

3.1.1 Highways England notes this representation.

3.2 The section of the M4 that is the subject of this enquiry will be configured to All Lanes Running, and we believe that on safety grounds, Highways England should reconsider this aspect of the proposal. Highways England officials have indicated that to date the sections of All Lanes Running Smart motorway have proven to have a better safety record than predicted. However, Highways England has not released evidence to support this assertion.

Highways England Comment

3.2.1 Evidence as to the safety benefits of ALR is presented in the Hazard Log Report (Annex E of the Engineering and Design Report (Application Document Reference 7.4). The hazard assessment methodology used to assess the expected safety performance of the smart motorways concept uses evidence (i.e. monitoring data on performance) built up from the M42 Pilot and more recent operational smart motorway schemes, (e.g. hard shoulder running schemes on the M6 around Birmingham and M62 J25-30). This has demonstrated that the use of the hard shoulder, as an additional lane, does not compromise overall safety.

3.2.2 In relation to Highways England releasing evidence from ALR schemes, monitoring is currently underway on the first ALR schemes on the M25 J23-27 and J5-7 to measure actual safety performance and compare it with the safety levels before the introduction of ALR. The one year monitoring report will be published by the end of 2015 and will be made available at that point. However, it should be noted that one year is a very short timeframe upon which to assess the efficacy of the schemes, which require three years of validated accident data for there to be confidence that they are meeting their safety objective.

3.3 We would therefore urge the enquiry to require Highways England to reconsider implementation of the Dynamic Hard Shoulder configuration on this and other proposed sections of Smart Motorway because of its proven record of safety and because the All Lanes Running configuration there is insufficient operating experience of All Lanes Running to confidently affirm that the risk assessment have over-estimated the risk to users.

Highways England Comment

3.3.1 As explained previously, Highways England's experience of operating HSR has shown that it is resource intensive and that it has a number of technology points of failure, which means that the hard shoulder cannot be regularly opened. ALR reduces these risks of technology failure and the risk to the workforce. The optimisation of the smart motorways design, and subsequent operations, has enabled Highways England to establish an operating regime resulting in efficient schemes that provide value for money, whilst maintaining safety above baseline levels. Consequently, ALR is Highways England's preferred operating solution to address congestion issues on the network.

3.3.2 The ALR design of the Scheme is likely to be no worse in terms of safety performance (than the baseline), as demonstrated in the Hazard Log report at Annex E of the EDR (Application Document Reference 7.4).

3.3.3 The monitoring results from the M25 J23-27 and J5-7 ALR schemes will give an indication of the actual safety level that can be achieved with all lane running allowing the hazard log assessment and hazard assumptions for ALR schemes to be reviewed, and if necessary revised, in line with the monitoring results. However, it is not accepted, as suggested in the representation, that "there is insufficient operating experience of ALR to confidently affirm that the risk assessment have over-estimated the risk to users". This is because the learning and operating experience from the M42 Pilot and subsequent smart motorway schemes has informed the safety assessment for the Scheme. Monitoring data and operational feedback has enabled Highways England to undertake appropriate safety assessments which has fed into the design process of schemes. The hazard log report (Annex E of the EDR (Application Document Reference 7.4)) notes that it takes account of work from other ALR schemes, e.g. M1 J28–31, M1 J32–35a and M25 J23–27.