

M60 Junction 8 to M62 Junction 20 smart motorway

Report on outcome of SI consultation on
implementation of variable mandatory
speed limits



**M60 Junction 8 to M62 Junction 20
Smart Motorway
Report on outcome of
SI Consultation on Implementation of
Variable Mandatory Speed Limits**

Date: 2 June 2014

Version: 0.2

Document Control

Document Title	Report on the outcome of SI Consultation on Implementation of Variable Mandatory Speed Limits
Author	Carl Stockton
Owner	Jacqui Allen
Distribution	
Document Status	Final

Revision History

Version	Date	Description	Author
0.1	25 February 2014	First Draft	Markakis, Georgios
0.2	02 June 2014	Final	Stockton, Carl

Reviewer List

Name	Role
Sally Keith	Dft Legal

Approvals

Name	Signature	Title	Date of Issue	Version

The original format of this document is copyright to the Highways Agency.

Table of Contents

<u>Executive Summary</u>	4
<u>1. Introduction</u>	6
<u>1.1 Purpose of document</u>	6
<u>1.2 Background</u>	6
<u>1.3 Consultation Principles</u>	6
<u>2. Summary of Responses</u>	7
<u>2.1 Analysis of responses</u>	7
<u>2.2 Support for the Smart Motorway Scheme</u>	8
<u>2.3 Other representations</u>	10
<u>3. Issues raised and the Highways Agency response</u>	11
<u>4. Summary</u>	27
<u>4.1 Recommendations</u>	27
<u>Annex A: Evidence Base</u>	28

Executive Summary

This document details the Highways Agency response to comments raised during the 12-week consultation period on the proposal to introduce Variable Mandatory Speed Limits on the M60 motorway between Junctions 8 to 18 as well as Variable Mandatory Speed Limits and Hard Shoulder Running on the M62 between Junctions 18 to 20 (“the Manchester Smart Motorways scheme”).

The consultation period began on 11 November 2013 and closed on 3 February 2014 and provided an opportunity for interested parties and members of the public to comment on the proposal.

Smart Motorways Objectives

The Highways Agency is committed to building upon the success of the existing variable smart motorways schemes which have been implemented on a number of busy motorway sections across the country. It is anticipated that the Smart Motorways project will:

- Increase motorway capacity and reduce congestion;
- Smooth traffic flows;
- Provide more reliable journey times;
- Increase and improve the quality of information to the driver.

Consultation Process

The consultation document M60-M62 Junctions 8 to 20 Smart Motorways Scheme together with appendices was issued as follows:

- By post direct to 118 stakeholders
- Made open to public consultation on the Highways Agency’s website

The consultation encouraged representative organisations, businesses and members of the public to make contact with the Highways Agency and communicate their views. The results of this process can be summarised as follows:

- 20 responses were received within the consultation period;
- 6 responses were in favour but all expressed reservation on some aspects of the scheme;
- 1 response was not in favour;
- 4 responses from Statutory Undertakers provided no comments on proposals;
- 3 responses made no comment;
- 6 responses were neither in favour nor against the proposal.

The responses raised a number of issues that are addressed later in this report.

Recommendation

Given the positive responses and due consideration of the issues raised, this report recommends that variable mandatory speed limits be implemented on the M60-M62 between Junctions 8 and 20.

1. Introduction

1.1 Purpose of document

The purpose of this document is to provide a summary of the responses received during the M60-M62 Junction 8 to Junction 20 smart motorways scheme consultation and to address the various issues raised. The 12-week consultation took place between 11 November 2013 and 3 February 2014 and provided an opportunity for stakeholders, such as road user groups, local government organisations, other interested parties and members of the public to comment on the proposal to implement smart motorways on the M60 and M62 between Junctions 8 and 20.

1.2 Background

Full details of the background to the scheme are published in the Annex 'Evidence Base' of this consultation report document.

1.3 Consultation Principles

We are conducting this consultation in accordance with the Consultation Principles on consultation updated on 5 November 2013 and which replaced the Code of Practice on Consultation issued in July 2008.

The consultation criteria are listed below.

- 1) When to consult** - Formal consultation should take place at a stage when there is scope to influence the policy outcome.
- 2) Duration of consultation exercises** - Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible.
- 3) Clarity of scope and impact** - Consultation documents should be clear about the consultation process, what is being proposed, the scope to influence and the expected costs and benefits of the proposals.
- 4) Accessibility of consultation exercises** - Consultation exercises should be designed to be accessible to, and clearly targeted at, those people the exercise is intended to reach.
- 5) The burden of consultation** - Keeping the burden of consultation to a minimum is essential if consultations are to be effective and if consultees' buy-in to the process is to be obtained.
- 6) Responsiveness of consultation exercises** - Consultation responses should be analysed carefully and clear feedback should be provided to participants following the consultation.
- 7) Capacity to consult** - Officials running consultations should seek guidance in how to run an effective consultation exercise and share what they have learned from the experience.

Further information about the Code of Practice can be located on the Department for Business Innovation and Skills website:

<http://www.berr.gov.uk/whatwedo/bre/consultation-guidance/page44420.html>

2. Summary of Responses

2.1 Analysis of responses

In total 20 responses were received, 4 of these responses were from statutory undertakers (SU's) and provided no comment on the proposals that had been consulted on. The responses from the SU's indicated whether their apparatus within the scheme area was affected by the scheme's proposal. A further 3 replies made no comment on the proposals.

Of the remaining 13 responses, 2 were replies from members of the public. One was neither in favour nor against but was more concerned that the proposals had no perceived positive impact on the problems experienced around Junction 18. The other member of the public did not make it clear whether they were in favour or opposed to the implementation of variable mandatory speed limits.

That left 11 responses with 6 in favour of the proposals but all expressing reservations on some aspect of the scheme. Further details of the reservations provided can be found in section 2.2 below. Another 4 expressed no objection but did not favour or object to the proposals. That left one respondent who was not in favour of the proposal. They were pleased that the original M60 Lane Gain Scheme had in their words "been scrapped" but felt that the scheme provides only a short-term solution to a much wider problem. The response was concluded with a request that the Highways Agency focus on efforts on looking at a long-term solution that would make this stretch of motorway less congested and less dangerous.

Those who responded in favour of the proposals are:

- Road Haulage Association;
- Automobile Association;
- Bury Council;
- Rochdale MBC;
- Greater Manchester Fire and Rescue Services;
- Transport for Greater Manchester.

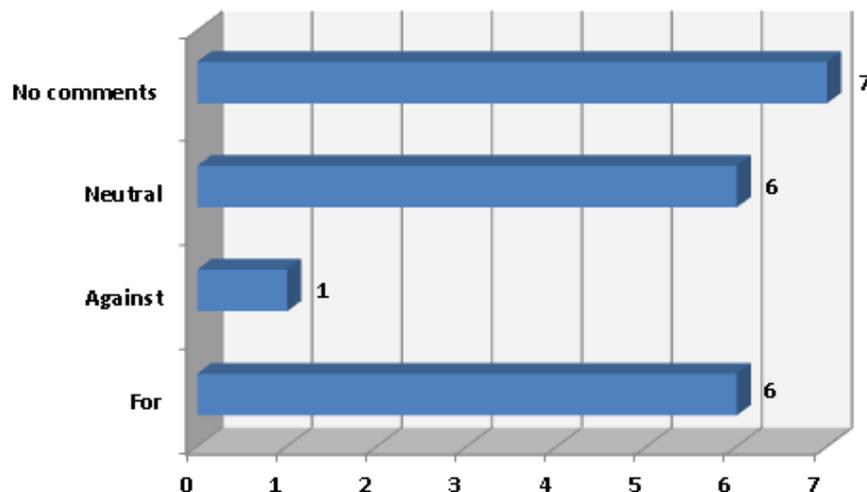


Figure 1: Responses to Consultation

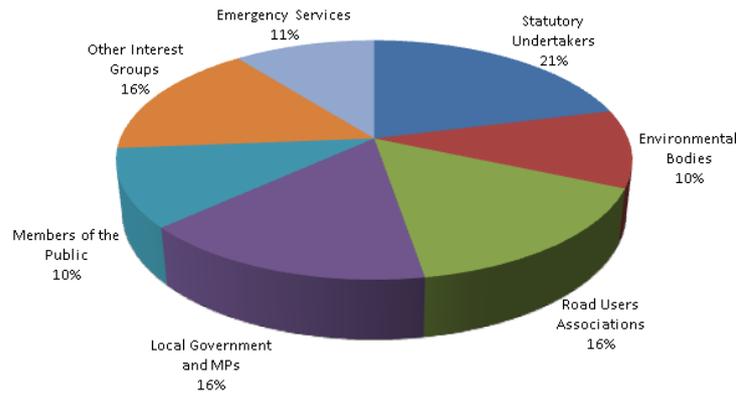


Figure 2: Breakdown of responding organisations

2.2 Support for the Smart Motorway Scheme

6 of the 20 respondents to the consultation were in favour of the smart motorway scheme, agreeing that the implementation of the scheme would lead to an improvement of travelling conditions on the M60 and M62 between M60 Junction 8 and M62 Junction 20.

The Road Haulage Association (RHA) stated that because the route is heavily used by the haulage industry they support the goals expressed in the consultation document of reducing congestion, increasing motorway capacity, providing more reliable journey times and improving the quality of information provided to drivers. Their members tell them that the route is busy and is frequently congested. In this context they see the smart motorway proposal as a sensible measure.

In terms of reservations they agree that there is a place for hard-shoulder running in peak flow periods, although they see this as a temporary solution only. The view of the RHA is that a permanent solution is needed that will involve road widening to increase road capacity or road building. They also go on to say they understand the environmental reasoning behind the decision not to include all-lane running on the M60 between Junction 8 and 18 but they are concerned that a bottleneck could be created as lane capacity changes from 4 to 3 lanes. If bottlenecks do develop then it is possible that pollution might get worse in the areas where the motorway goes down to 3 lanes from 4 than it is at present.

The Automobile Association (AA) welcome the improvement to journey times/congestion reduction the Controlled Motorway and SM (ALR) scheme will bring to the M60 between J8 to J20. However they go on to state that there are some issues which leave them uneasy. They have particular concerns over the distance between emergency refuge areas, the risk created by vehicle breakdowns in lane one (especially in the dark/quiet) and drivers' ability to see the nearside only variable message signs particularly in relation to the operation of the speed limit.

They go on to state their belief in the importance of drivers being able to find England's strategic road network consistent and easy to understand. Capacity improvement switching from widening to SM/ALR arrangements may ultimately create a risk of confusion amongst some drivers with this being particularly the case with this scheme which will contain both Controlled Motorway and ALR sections. Finally they believe it is

important for there to be transparency regarding speed enforcement so drivers are under no illusion that compliance with speed limits will be essential to maintain safety. High profile signage and information will be important in gaining drivers support.

Bury Council would expect that the proposals will be effective in reducing congestion on the motorway network, at least in the short term. However they go on to say that they have a concern that the scheme will only provide relief to current problems over a limited time frame. This is particularly the case given the aspirations for growth and economic development in Greater Manchester which will inevitably generate additional traffic on the motorway network, serving as it does as a conduit for both intra and inter-urban movements.

They go on to state that they have concern that additional capacity afforded by the all-lane running is only to be provided between M62 J18 -20, and not on the M60 section. However, they fully recognise and support the reasons for not introducing all-lane running throughout the scheme at the present time.

In addition they add comments on the interface the scheme will have with their local road network at M60 Junction 17. On-motorway congestion leading to slip road queues is often the source of congestion and delays on their network in this area leading to negative effects on traffic movements and the environment in Whitefield and Prestwich. Consequently they welcome any congestion reduction initiatives on the motorway which will relieve problems on the local roads.

Rochdale Metropolitan Borough Council considers that the proposal to introduce the smart motorway scheme on the M60 and M62 between the junctions concerned will lead to an improvement in travelling conditions on this section of motorway and no aspects of the proposal to introduce smart motorways give them any concerns.

They do however go on to mention a new link road being developed in Heywood at Junction 19 of the M62. They believe consideration needs to be given both by themselves and the HA to possible effects of both schemes having overlapping or similar construction periods.

Transport for Greater Manchester (TfGM) believe that the scheme which will manage the flow of traffic more effectively and in accordance with the prevailing conditions, will lead to an improvement in travelling conditions, both for long-distance and sub-regional journeys. However they recognise that in addition to catering for current traffic levels, the motorway network also needs to support the future economic growth of the conurbation. There are major growth opportunities that they identified in Greater Manchester, vital not only to the economic success of the conurbation but to the rebalancing of the UK economy as it emerges from recession. All of these opportunities will impact, to some extent, on this section of the motorway. They therefore are greatly concerned that the current proposal will only introduce all-lane running for the M62 J18 to 20, and not for what they conceive as the crucial section of the M60 between J8 and J18. Whilst the proposed controlled motorway section between J8 and J18 will relieve current congestion, it is unlikely to provide a solution for the medium term, given the likely traffic growth.

TfGM appreciate that air quality is an issue on this stretch, but they would like to understand the extent to which a reduction in traffic speed, as proposed for the M1 J28-35a and also on the A556 Knutsford to Bowdon Improvement, would reduce emissions in combination with other mitigation measures, and therefore allow the introduction of

all-lane running between J8 and J18 in the future.

Greater Manchester Fire and Rescue agree with the overall view of Transport for Greater Manchester that the proposed scheme will manage the flow of traffic more effectively and will lead to an improvement in travelling conditions. They consider that this substantial investment into our motorways will have a positive impact on our networks. However they express concerns over the All-lane running section of the scheme on M62 between J18 and 20. They feel that this approach of permanently removing the hard shoulder has not yet been trialled in any other part of the country. They feel although they are broadly supportive of the smart motorway initiative that the concept of permanent “all-lane running” proposed brings enhanced challenges both in terms of general road safety and emergency attendance of incidents. They then go on to split these two concerns into the positive features and in to challenges that they feel need to be overcome before all parties can work together to ensure the scheme is safe.

2.3 Other representations

One member of the public was neither in support or opposition to scheme but had some comments about the effect on J18 of the M60. They could not see any proposals that may alleviate the problems at this junction.

3. Issues raised and the Highways Agency response

The comments received during the consultation period have been analysed and a response prepared.

Table 3.1 sets out the results of this analysis together with the corresponding Highways Agency's response.

The responses received also raised issues, which are outside the scope of the consultation, and these are addressed in Table 4.1.

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
1	<p>We are concerned that a bottleneck could be created as lane capacity changes from four to three lanes. If bottlenecks do develop then it is possible that pollution might get worse in the areas where the motorway goes down to three lanes from four than it is at present.</p> <p>We are concerned that adequate resources are not in place to deal with enforcement issues when variable speed limits are introduced. We fear that pressures on roads policing budgets may mean that enforcement of managed motorway speed limits will prove challenging.</p>	<p>The scheme will be providing additional capacity between M62 junction 18 (Simister) and junction 20 (Rochdale) only. This additional capacity will be provided by converting the hard shoulder to a permanent running lane. This is known as all lanes running. The all lane running section will start westbound and end eastbound at junction 20 by utilising a lane gain / lane drop. Eastbound the fourth lane will exit at junction 20 leaving 3 lanes to run through the junction into its existing lane configuration. Westbound the on slip at junction 20 will form a lane gain, increasing the capacity from 3 to 4 lanes. The section between M60 junction 15 and junction 18 is already 4 lanes in both directions. This will mean that no bottle neck is created between this section and the new all lanes running section on the M62. The scheme has carried out a robust environmental assessment which has concluded that the scheme will have an overall neutral effect on pollution. The scheme will make the current situation no worse as a result.</p> <p>Enforcement of variable mandatory speed limits is carried out by Highways Agency Digital Enforcement Compliance (HADEC) cameras. These cameras are paid for and installed by the Highways Agency. The Greater Manchester Police are responsible for enforcement. The Highways Agency pays GMP to carry out enforcement. The payment model is structured to ensure that the GMP ticketing office actual costs are fully met and that there are sufficient resources available to process offences captured by the HADEC cameras. Manual enforcement can also be carried out by Police patrol vehicles. We are unable to comment on Police resources for manual enforcement.</p>
2	<p>The smart motorway will have an interface with our local road network at M60 Junction 17. On-motorway congestion leading to slip road queues, is often the source of congestion and delays on their network in this area leading to negative effects on traffic movements and the environment in Whitefield and Prestwich.</p>	<p>The traffic data prepared for the proposed scheme includes the traffic impacts on all 'affected routes', not just the M60/M62. These traffic data are used as the basis for the air quality and noise modelling undertaken as part of the Environmental Assessment for the scheme. As such, any impacts on traffic movements and the environment in neighbouring areas such as Whitefield and Prestwich will have been considered as part of the scheme assessment</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
3	<p>There has been some criticism from disabled people for the hard shoulder being used as an overflow lane as they fear they would be less safe than others since they cannot leave their car in the event of a breakdown. This is because many disabled people need the car door to be fully opened and this is just not possible with very fast moving traffic passing by. This is also problematic for people who drive from their wheelchairs, people who need to get their wheelchairs from roof boxes or the rear of their vehicles and would not be able to reach a safe area quickly and not at all if it entails going to the other side of a crash barrier. Ambulant disabled people may also not be able to move fast enough and be able to reach a safe area for the same reasons especially if they need to get their aids from their vehicle. Taking these issues into consideration the question of where disabled people could go in case of breakdown needs to be seriously considered.</p>	<p>Existing smart motorways already involve part-time use of the hard shoulder as a running lane. The experience gained from safely operating these schemes has allowed us to simplify the driving environment on newer schemes by permanently converting the hard shoulder into a traffic lane (known as 'all lane running'). There are risks involved in stopping on any hard shoulder, and smart motorways addresses this risk by introducing emergency refuge areas which are set back from the carriageway. These refuge areas are provided at frequent intervals, and we advise motorists to stop in one in case of an emergency (e.g. a critical vehicle fault), and to use the emergency telephone if they need further assistance. If the situation does not require an immediate stop, our advice is to leave the motorway at the next junction or service area. The refuge areas are designed to accommodate a large vehicle, so there is no need for drivers or passengers to leave their vehicle in order to reach one.</p> <p>Experience has shown that it is very rare that a driver is unable to reach a refuge area if they need to stop whilst on a smart motorway section. However, in the unlikely event that this should happen, we advise drivers to stop in the left-hand lane and wait on the verge if it is safe to do so. For drivers or passengers with a disability who are not able to do this, our advice is to stay in the vehicle with their seatbelt on, turn on the hazard warning lights, display a 'help' pennant, and if they have a mobile phone attempt to contact the Emergency Services. This is the advice given in section 278 of the Highway Code, and applies on all sections of road without a hard shoulder. The technology installed on each smart motorway scheme provides a highly controlled environment which allows better detection and management of incidents. During busy periods, detection loops below the road surface identify breakdowns in traffic flow, and automatically set reduced speed limits on the approach to an incident. The overhead signals can be used to display warning messages to approaching drivers and close lanes to protect broken-down vehicles until assistance arrives, which is not possible on a traditional motorway.</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
3		<p>Smart motorways also have greater CCTV coverage, which gives our regional control centre operators greater awareness of what is happening during any incident and allows them to advise the emergency or recovery services more effectively.</p> <p>Evidence has shown smart motorways to be a safe and effective way of reducing congestion. Each scheme has to meet strict safety criteria, and would not be allowed to proceed if it would have a negative impact on safety. Existing smart motorways have met and exceeded this requirement, delivering a reduction in incidents as well as tackling congestion, and the newer 'all lane running' schemes are also expected to achieve this. We also encourage all drivers to avoid preventable stops by making sure their vehicle is properly maintained and fit for the journey they intend to make, including checking the fuel, oil and water levels and the condition of the tyres.</p>
4	<p>It is of great concern that the current proposal will only introduce all lane running for the M62 J18-J20, and not for the crucial section on M60 J8-J18. While the proposed controlled motorway scheme between J8 and J18 will relieve current congestion, it is unlikely to provide a solution for medium term, given the likely traffic growth.</p> <p>While air quality is clearly an issue on this stretch of motorway, TfGM would like to understand the extent of which a reduction in traffic speed, as proposed for the M1, J28 to J35a and also for the A556 Knutsford to Bowdon Improvement, would reduce emissions in combination with other mitigation measures, and therefore allow the introduction of all-lane running between J8 and J18 in the future.</p>	<p>It is acknowledged that the current proposals do not provide a solution across the full extent of M60 J8-15. That said, the proposals have been assessed for the usual 15 year period after opening that allows for traffic growth, and found to provide a positive benefits cost ratio (BCR), demonstrating value for money. The Agency is continuing to investigate further interventions which, subject to funding and deliverability, may come forward in due course. Phase 2 of the scheme will look to upgrade the motorway to 4 lanes SM-ALR between J8-12. Options are currently being considered for alternative solutions between J12-15.</p> <p>Introduction of a 60mph speed limit was considered as a mitigation option to reduce the impact of the Manchester Managed Motorway. This work indicated that imposing a speed limit as proposed for the M1 was not an effective mitigation measure and did not significantly reduce the scheme's air quality impacts. The key reason for this was that in the areas where the scheme had both the greatest impact and highest modelled concentrations of nitrogen dioxide, the traffic model speeds during the day on the M60 were lower than the proposed speed limit. As a result the introduction of a speed limit did not result in any significant changes to the traffic volumes and therefore no significant effect on emissions.</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
5	<p><u>Safety Concerns</u></p> <ol style="list-style-type: none"> 1. <u>The increase in distance between ERAs of up to 2.5kms raises the following concerns:</u> <ul style="list-style-type: none"> ▪ Less motorists will reach the safety of an ERA and be stranded in a live lane ▪ Lane one closures may be less effective when using VMS ▪ ERA's may not be lit ▪ Is there sufficient lead in and lead out at either end of the ERA to allow safe entry and exit? 2. <u>Unlit Sections of Road:</u> <ul style="list-style-type: none"> ▪ This is of particular concern when a motorist is stranded in lane one at night with an electrical fault affecting the lights ▪ CCTV coverage and night time effectiveness is not clear ▪ MIDAS will have limited affect at detecting stranded motorists driving during quiet night time 3. <u>Limitation of overhead gantries and reliance on VMS:</u> <ul style="list-style-type: none"> ▪ May not be visible from outside lanes ▪ Lorries may obscure signs ▪ The distance between signs is not clear ▪ Adherence to "wicket" signs may be poor ▪ Speed limit enforcement? 	<ol style="list-style-type: none"> 1) IAN 161/13 provides the design requirements for refuge areas (of which ERA's are one type), which have been complied with on the MSM Phase 1 scheme. 2) The M60 J8-18 and M62 J18-20 will be lit throughout, with new verge lighting, and in some areas existing central reserve lighting. <ol style="list-style-type: none"> i. CCTV coverage is designed to provide full coverage, as described in IAN 161/13 paragraph 6.30. ii. During low flows MIDAS loops will have limited effect, however with the multi-faceted approach the scheme is not reliant solely on the detection loops. 3) The provision of MS4s mounted on gantries has been designed to provide viewing angles that provide coverage for all mainline lanes. <ol style="list-style-type: none"> i. Signs mounted on gantries are less likely to be obscured than those provided in the hard shoulder. ii. Distances between signs is variable due to the complex nature and spacing between junctions. Generally a Primary, Secondary, Final and Route Confirmatory signs will be provided for each junction, however some signage will serve more than one junction. iii. Remotely operated maintenance Fixed Taper Point Signs (FTP) are currently being considered throughout the scheme. On SM-ALR sections the FTP signs would be supported by the MS4 and MS3 signs to warn the travelling public of roadwork's ahead / speed limits apply. <p>Speed limits will be enforced at various locations throughout the scheme using the latest HADECS equipment. The matrix signals over each lane will display a mandatory speed limit (with a red roundel) to suit road conditions or in response to an incident.</p> <p>The entire length of the scheme from M60 junction 8 to M62 junction 20 is currently lit and will remain so. There are currently no proposals to remove or switch off street lighting on this section of our network as part of this scheme.</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
5		<p>The scheme will provide 100% CCTV coverage for the majority of the scheme. The coverage between M60 J15 to J18 will provide 80%-90% coverage. Low light CCTV cameras are to be installed. If a vehicle stops in a live lane, even with an electrical failure affecting its lights, our RCC operators will still be able to pick it up on the cameras. Our RCC operators will then be able to set signs and signals to protect the vehicle and inform other road users that there is a stranded vehicle on the carriageway. They will also be able to dispatch help to the stranded vehicle to recover it and its occupants to safety. MIDAS is not the only tool that can be used to detect a stranded vehicle. CCTV, Traffic Officers Patrols, Police Patrols or members of the public can alert us to live lane breakdowns. Also look at response 12.</p>
6	<p>There is concern that the scheme will only provide relief to current problems over a limited time frame. This is particularly the case given the aspirations for growth and economic development in Greater Manchester which will inevitably generate additional traffic on the motorway network, serving as it does as a conduit for both intra- and inter-urban movements. More information is given in the separate response from Transport for Greater Manchester (TfGM) colleagues.</p> <p>We do have concern that additional capacity afforded by all-lane running is only to be provided between M62 J18-20, and not on the M60 section. However we fully recognize and support the reasons for not introducing all-lane running throughout the scheme at the present time.</p>	<p>It is acknowledged that the current proposals do not provide a solution across the full extent of M60 J8-15. That said, the proposals have been assessed for the usual 15 year period after opening that allows for traffic growth. Liaison has been undertaken with TfGM, the Greater Manchester local authorities and those of neighbouring counties. These consultations have identified both planned and aspirational development proposals and these have been incorporated into the transport model. With these developments included, the scheme has been found to provide a positive BCR, demonstrating value for money. The support for the rationale behind the present proposals is welcome; meanwhile the Agency is continuing to investigate further interventions which, subject to funding and deliverability, may come forward in due course. Phase 2 of the scheme will look to upgrade the motorway to 4 lanes SM-ALR between J8-12. Options are currently being considered for alternative solutions between J12-15.</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
7	<p>We have particular concerns over the distance between emergency refuge areas, the risk created by vehicle breakdowns in lane one (especially in the dark/quiet) and drivers' ability to see the nearside only variable message signs particularly in relation to the operation of the speed limit. The proposals for the M60 MM (ALR) will lead to a managed motorway which will be less safe than the M42 MM scheme and also less resilient in the event of major incidents.</p> <p>The AA believes it important that drivers who use England's strategic road network should find it consistent and easy to understand. Capacity improvements which are currently being delivered by widening, including provision of a hard shoulder, will increasingly switch to MM/ALR arrangements and this may ultimately create a risk of confusion amongst some drivers. This is particularly the case for the above scheme which will contain both Controlled Motorway and ALR sections. We do not believe managed ALR motorways provide as robust a solution to capacity problems on our motorways for the very long term. However, given the current economic circumstances, relieving congestion at lower cost and hopefully at no greater risk is perhaps understandable.</p>	<p>The Manchester Smart Motorway scheme has provided refuge areas in accordance with IAN 161/13.</p> <p>Signal gantries spacing is a minimum 600m and up to a maximum 1,500m apart. In instances where only a VMS is provided, the MS4 will be mounted on the gantry, providing adequate sighting to it from all lanes.</p> <p>Also look at response 12.</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
8	<p>Furthermore, RMBC would like to bring to your attention the proposals for a new link road in Heywood, located off the M62 at junction 19. Details of the final design for the proposals for the link road are currently being developed, in conjunction with officers at the HA. Consideration is required by RMBC and the HA towards the effects of both schemes being within overlapping in similar construction periods. At junction 19 the fourth lane runs through the slip road, and the final design is not clear on the effect for accommodating the new junction/slip road.</p>	<p>Our design is only able to accommodate confirmed local authority and private developer schemes. We are unable to factor in schemes, such as the new link road in Heywood, that are still in development into the scheme design.</p> <p>The Highways Agency is committed to work with Rochdale Metropolitan Borough Council as proposals for new link road in Heywood develop.</p>
9	<p>This development could, potentially, have an impact upon the setting of a number of designated heritage assets in the area flanking the motorway. In line with the advice in the NPPF, we would expect the Environmental Report to contain a thorough assessment of the likely effects which the proposed development might have upon those elements which contribute to the significance of these assets. We appreciate that there will be no additional groundworks as part of the development, however, we do feel that the proposals might have a negative visual impact on designated heritage assets.</p> <p>The assessment should also take account of the potential impact which associated activities (such as construction activity, servicing and maintenance, and associated traffic) might have upon perceptions, understanding and appreciation of the heritage assets in the area. Assessment should also consider, where appropriate, the likelihood of alterations to drainage patterns that might lead to in situ decomposition or destruction of below ground archaeological remains and deposits, and can also lead to subsidence of buildings and monuments.</p>	<p>The EAR prepared for the proposed scheme addressed potential impacts on the setting of designated heritage assets within the Landscape chapter of the report. However, following consultation with English Heritage an addendum chapter to the EAR is being prepared to address these issues in more detail.</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
10	<p>Safe distance between vehicles must be ensured and regulated, to prevent accidents due to adapting to changing speeds.</p> <p>Although cameras allow delays to be incorporated to prevent offence registration. Abrupt changes of speed should be accommodated as well. Time allowance such as a visible timer/countdown to speed change should be implemented. For example, if the speed has to go down from a 60 to 50, a flashing sign should show that the new speed would be 50 and would be implemented in 10, 9, 8, 7, 6, 5,4,3,2,1 seconds.</p> <p>The areas surrounding the M60 and M62 are green, fog, smog and other weather effects should also be taken into consideration.</p>	<p>Variable mandatory speed limits reduce the speed of traffic to smooth out the flow of vehicles. This ensures that vehicles are all travelling at a consistent speed. Highways Agency Digital Enforcement Compliance (HADEC) cameras will be installed as part of the scheme. These cameras are installed to ensure that drivers comply with the speed limit. When the system is in operation the speed limit is displayed on overhead gantries. These gantries are spaced and sighted to allow drivers sufficient time to adjust their speed to comply with the mandatory speed limit displayed on the overhead gantry. This ensures that there are no sharp breaking movements when the speed limits change. Smart motorways have been in operation in this country since 2006 when the pilot scheme opened on the M42 in the West Midlands. Analysis of the data since opening has found that accidents have reduced by over 50% and no one has been killed or seriously injured whilst the system has been in operation. Unfortunately, smart motorways cannot regulate driver behaviour and we are reliant on drivers to comply with variable mandatory speed limits & to keep a safe distance between them and the vehicle in front. Advice for safe distances between vehicles is detailed in the Highway Code, Section 103 to 158: - General rules, techniques and advice for all drivers and riders. Section 126 provides details of safe stopping distances and recommends that drivers leave a gap of at least 2 seconds between them & the vehicle in front in good conditions. Failure to maintain a safe distance between you and the vehicle in front is a road traffic offence and is enforceable by the Police.</p> <p>There are no abrupt changes to the speed limit when variable mandatory speed limits are in operation. As variable speed limits come into operation the maximum speed limit will be reduced incrementally down from national speed limit i.e. 60, 50, 40, 20. As stated previously, when variable mandatory speed limits are in operation the new speed limit is displayed on overhead gantries. These gantries are sufficiently spaced to allow drivers to see changes to the speed limit well in advance of the next gantry and to adjust their speed accordingly. We have no proposals to implement a countdown system for when variable mandatory speed limits are in operation and the speed limit changes.</p> <p>Smart motorways are designed to operate in all weather conditions. The technology allows us to vary speed limits in the event of adverse weather conditions such as high winds or fog. The signs allow us to give drivers more information to inform them of network conditions.</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
11	<p>1) I have serious concerns about the cost of the scheme. Whilst I welcome the decision to shelve the original Lane Gain proposals, I believe the revised plans to be a costly and short-term plan.</p> <p>2) The scheme provides only a short-term solution to a much wider problem. We need better thought-out proposals for the long term, developed in conjunction with local people.</p> <p>3) I remain concerned about air and noise pollution in this area. The current mortality figure for Salford attributable to air pollution is as high as 6%, which is higher than the average for England of 5.6% and much higher than the figures for other parts of the country. I understand that the main pollutants of concern in Salford are nitrogen dioxide (NO₂) and particulate matter (PM₁₀). The main source of pollution in the city is traffic. Nitrogen dioxide emissions affect lung function and increase respiratory problems.</p> <p>4) Noise pollution is another major concern along this stretch of motorway. EU Environmental Noise Maps show that this area of road has extremely high levels of noise</p>	<p>1) The Manchester smart motorway scheme is economy scheme designed to create economic benefits by alleviating congestion on one of the busiest sections of motorway in the country. Congestion costs the economy over £2 billion every year. By introducing smart motorways between M60 junction 8 and M62 junction 20 we will improve journey times and safety which will in turn create economic benefits for the region and country as a whole. The scheme has been subject to a robust economic assessment which balances the cost of the scheme against the predicted benefits that the improvement to the motorway will bring to both road users and businesses. This is known as a benefits cost ratio (BCR) and is used to assess if a scheme provides value for money. The Manchester smart motorway scheme has been assessed as providing a BCR of 2.06. This means that for every £1 we invest we get £2.06 Of economic benefits in return. The generation of these benefits is assessed over a 15 year period.</p> <p>2) The Manchester smart motorway is unable to deliver all of the benefits we originally intended. One of the main causes of unreliable journey times between M60 junctions 15 (Swinton) and M60 junction 8 (Carrington) is a lack of capacity. This section of our network was never designed to carry the amount of vehicles that currently use this section every day. The scheme had originally planned to convert the hard shoulder to a permanent running lane on this section. As part of any major improvement scheme we are required to carry out robust environmental assessments into the predicted impact of the scheme. Our assessment concluded that by providing additional capacity between M60 junctions 15 to junction 8 we would have a detrimental impact on local air quality over time. We take our responsibilities to human health very seriously and as a result changed the scope of the scheme to only provide controlled motorway, with no additional capacity, on this section. We still need to provide additional capacity on this heavily congested section of the M60. We are therefore taking the Manchester smart motorway scheme forward as a 2 phased approach. Phase 1 will deliver controlled motorway from M60 junction 8 to junction 18 and additional capacity by converting the hard shoulder to a permanent running lane</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
11	<p>pollution. Urgent action is needed in order to make a drastic reduction in the air and noise pollution generated by traffic in this area. In the long-term and when finances allow, local people should be fully consulted on a scheme that addresses the poor design of junctions 12 and 13 and which takes a different approach to reducing congestion on this stretch of the M60 motorway.</p>	<p>between M62 junctions 18 to 20. Please note that our environmental impact concluded that additional capacity on this section has a neutral effect on air quality. Phase 2 is currently a feasibility study into options that will provide additional capacity but not have an adverse impact on the environment. Depending on the outcome of the study and the options identified we will consult extensively with local people; allowing them to express their opinion on the option(s) identified.</p> <p>3) We are aware of the air quality issues around Manchester and on other sections of our network. The assessment of the impact of our schemes on air quality is one of the main focuses when we carry out environmental assessments for major improvement schemes. The Highways Agency takes our commitments to human health & economic growth very seriously when planning our schemes. The Manchester smart motorway scheme has carried out a robust environmental assessment which included detailed reviews of the impact of the scheme on local noise & air quality. Our environmental assessment has concluded that the scheme will make existing noise and air quality problems on this section of our network no worse. Overall the scheme has a neutral effect on air quality and noise.</p> <p>4) The Manchester smart motorway schemes environmental assessment report has concluded that the scheme will have a neutral effect on noise. The scheme will make existing noise levels no worse. We therefore have no mandate to provide any noise mitigation as part of the project. We acknowledge that sections of the scheme have been identified as none compliant with noise as part of defra's noise mapping, in accordance with the Environmental Noise Directive (Directive 2002/49/EC). The Highways Agency are required to produced action plans to address noise in these areas. The noise mitigation proposed by the Highways Agency is the provision of low noise surfacing. In order to gain best value for the tax payer it has been agreed to bring forward resurfacing works from the maintenance programme into the scope of the Manchester smart motorway scheme. This means best value for the tax payer through economies of scale as we already have a contractor on site. This approach</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
		<p>will also minimise disruption for the road user; by undertaking all of the works at the same time we will not need to come back in the immediate future and implement new road works. The Highways Agency uses low noise surfacing for resurfacing our network as standard. The entire length of the scheme from M60 junction 8 (Carrington) to M62 junction 20 (Rochdale) will be resurfaced with low noise surfacing during the construction of the smart motorway scheme.</p>
12	<p>Is the provision of refuge areas at intervals of 2500m sufficient? While we accept that incidents will be closely monitored and managed using the advanced motorway indicators and variable message signs, we are concerned that road users will find themselves in difficulty in the seconds following a breakdown or a collision without immediate egress from the moving carriageway. Vehicles that need to stop but fail to reach an emergency refuge area (due to reduced numbers) will be stopping in a running lane and no place of safety for the occupants or responders will be available.</p> <p>Is a programme of public education planned to assist with the safer transition to Smart Motorways and what will this involve?</p>	<p>IAN 161/13 Paragraph 5.24 states “<i>Throughout an MM-ALR scheme, refuge areas must be provided such that a road user never has to drive more than 2.5km from a decision point to a refuge area. A decision point can either be an ERA or the nose of an exit slip. Between ERAs, the distance should be measured between the stopping area within each adjacent refuge area, e.g. not from the end of the tapers</i>”.</p> <p>The MSM scheme is split into two distinct sections:</p> <ul style="list-style-type: none"> • Controlled Motorway between J8-18 • SM-ALR between J18-20. <p>The hardshoulder with adequate widths provide the refuge areas between J8-18, ERTs will be reinstated in their current positions. Between Junctions 18-20 the scheme designed has ensured that the minimum requirements detailed in paragraph 5.24 have been provided. With the introduction of three ERA's in the scheme, along with the Birch Services MSA.</p> <p>The Highways Agency has launched a driver information campaign in December to inform the public about how to use sections of smart motorways on England's motorway network. The Agency's 'Get Smart' campaign will help road users understand the different driving environments, types of signs and signals they will see and what to do in the event of a breakdown when travelling on a smart motorway. Each of these key themes, among others, is easily identifiable through a series of icons that appear on all of the campaign materials. Campaign materials such as posters, information leaflets and web banners are available on the Agency's website.</p>

TABLE 3.1: RESPONDENTS' COMMENTS AND THE HIGHWAYS AGENCY'S RESPONSE

Ref.	Respondents' comment	Highways Agency comment
13	<p>In an "All Lane Running" environment there could be potential delays in GMFRS reaching casualties with life critical support, thus resulting in more fatalities or long term consequences for those injured. Due to the unavailability of a dedicated emergency lane (hard shoulder), undoubtedly emergency response times and access to incidents on the motorway will be affected, especially in busy periods.</p>	<p>On the M60 Manchester Smart Motorway scheme due to the environmental constraints we can only introduce All Lane Running with the hard shoulder being used permanently on the M62 section between J18 and J20. This leaves a significant section of the scheme where the hard shoulder will remain available for use by the emergency services in an emergency situation.</p> <p>In addition experience to date of other Smart Motorway schemes is that both the number, and crucially the severity, of collisions tend to decrease within the controlled environment that a Smart Motorway creates. Therefore the instances when emergency services have to attend an incident within a Smart Motorway is much reduced, providing clear benefits compared to the situation beforehand.</p> <p>In terms of delays caused by the All Lane Running (ALR) environment, feedback to date has shown that on the whole transit times have not been lengthened – indeed, on the M42 ambulance service colleagues noted that one consequence of Smart Motorway schemes is that the motorways are generally more free flowing, leading to better transit times for all patients. Of course good liaison between the emergency services and our control room is important and we seek to work closely with colleagues in the emergency services to achieve this.</p> <p>In many instances, traffic is able to pass the scene of an incident both because the incident itself is less severe than on a traditional motorway and the additional carriageway capacity provides more opportunity for other vehicles to pass the scene. Complete carriageway blockages as a consequence of an initial incident are rare, although we recognise the need to plan for such eventualities.</p> <p>With the provision of motorway incident detection and automatic signalling (MIDAS) and full CCTV coverage it will be possible to detect incidents quickly, in particular major incidents, and rapidly start the process of directing resources and managing the incident.</p> <p>Once an incident is detected our Regional Control Centre will set a lane closure to</p>

protect the incident. In addition we will close either lane 1 (for nearside incidents) or lane 4 (for offside incidents) as an emergency access lane back to the upstream junction. There is evidence from Smart Motorways schemes that this does work. However, it is recognised that in some circumstances it may be difficult for vehicles to move out of the closed lane.

ALR schemes will generally have a hard strip on the nearside and offside, and this will provide additional space for vehicles to move out of the way of core responder vehicles trying to access an incident when the creation of an emergency access lane has not been successful.

If all of the above fails, then procedures include the use of reverse flow for access from a downstream access point. This will only be attempted once there is a resource to manage the traffic at the head of the scene.

It is recognised that it is an issue if a queue were to form upstream of an incident and the emergency services were unable to find a way through as all four lanes were occupied with traffic. This was thought to be an issue when the concept of Smart Motorways – Hard Shoulder Running (SM-HSR) was first developed, however to date has not been a significant issue. Nevertheless, the procedures necessary to facilitate access through traffic are an important consideration. Although there are existing procedures for such scenarios, we have worked nationally and locally with the emergency services to ensure that our control centres can provide the most appropriate support to the emergency services for access to incidents on All Lane Running sections.

We have worked with the emergency services through the Operating Smart Motorways engagement, with a steering group and task and finish groups, to develop processes and procedures for incident management on All Lane Running (ALR). This work has been continued locally, in particular on the M25 where we have worked with the emergency services to develop an M25 Regional Operating Agreement for “Incident Discovery, Verification and Access”.

	<p>Consideration of a radio system within the works area, for the duration of the scheme, for communications with emergency service personnel, if the works area needs to be accessed.</p>	<p>We are, and will continue, to work closely with the emergency services throughout the construction phase of the scheme. This will include regular liaison meetings and the creation of incident management plans and procedures. We intend to create procedures for the emergency services to access the works area if required. Procedures for access have been successfully setup on smart motorway schemes in other regions. We will build on the lessons learned from these schemes. As we approach start of works we will be in close contact with the emergency services and other stakeholders to agree the procedures for the scheme and how the scheme can assist the emergency services with incident management for incidents that occur through our works.</p>
--	--	---

TABLE 4.1: RESPONDENTS' COMMENTS OUTSIDE THE CONSULTATION REMIT AND THE HIGHWAYS AGENCY RESPONSE

Ref.	Respondents' comment	Highways Agency comment
1	<p>We have recently received notification of proposed works on the M62 at junction 31 eastbound exit slip road, and at the M62 at junction 32 eastbound exit slip road both between June and November 2014. We note that the carriageways will be widened to provide additional lanes, and while welcoming the work, we are concerned that the disruption to the operations of our members should be kept to a minimum, given that the improvement work related to the smart motorway scheme will also be underway.</p>	<p>The consultation is limited to the introduction of variable mandatory speed limits on the M60 between junctions 8 (Carrington) & junction 18 (Simister) and M62 junction 18 (Simister) & junction 20 (Rochdale).</p> <p>The improvement works on M62 junction 31 & 32 fall outside of the scope of this consultation.</p>
2	<p>Regarding the proposed improvements to the M60 junctions 8 to 20, I cannot see any proposals that may alleviate the problems at Junction 18. In the morning traffic coming on at 17 east bound has to cross the flow of traffic coming off at 18, speed restriction could help this situation but for one thing – traffic wanting to continue clockwise on the M60 has to negotiate the roundabout at Simister. Because this stream of traffic has to cross the traffic coming south on the M66 that wish to continue anticlockwise on the M60 the traffic comes to stop. This creates tail backs on the M60 back beyond Jt 17 and the south bound M66 is a virtual car park. Traffic coming off the M60 wishing to head north on M66 also get ensnared.</p> <p>I travel this route 5 days a week and the Simister island problem creates a 20 to 30 minute delay at peak times, for a 'Ring Road' surely this is unacceptable. I would also add that the Leeds bound traffic is impacted upon as is the Oldham bound traffic.</p>	<p>Junction improvements do not form part of the scope of Manchester smart motorway scheme. We have no proposals to improve the Simister Island roundabout as part of the scheme.</p> <p>Improvement works to Simister Island (M60 / M62 junction 18) do not form part of this consultation.</p>

4. Summary

As the response analysis shows, there has been very little response from the number of organisations invited to comment. This may be due to the fact that:

- the M60 Junction 8 to M62 J20 Smart Motorway Scheme is well understood by users and it is felt no further comment is necessary,
- the information published on the Highways Agency website, in the media and at the Public Information Exhibitions in October and November 2013 and in the consultation documents has adequately addressed concerns.

The majority of people who responded to the consultation are in favour, neutral or provided no comments on the proposal to introduce variable mandatory speeds limits on the M60 - M62. The supporting groups represent Local Authorities, Businesses, representative organisations, emergency services and members of the public. Only 1 respondent objected to the proposal.

It is considered that the issues raised during the consultation have been addressed in the analysis. The analysis also notes that some of the comments received were outside of the consultation remit, but it is accepted that an open consultation of this nature also provides a platform for other views to be put forward.

4.1 Recommendations

In support of the proposal to introduce Variable Mandatory Speed Limits on the M60 and M62 between Junctions 8 and 20, various studies commissioned since the introduction of the trial schemes on the M42, M40 and M6 have established conclusively that managed motorway technology does provide benefits. They not only reduced congestion and journey time reliability, but also improved safety.

On 23 November 2012, DfT Better Regulation Team advised HA that managed motorway schemes with an approved business case that required regulation to enforce mandatory speed limits were out of scope of **One In One Out**. As a consequence, there is no longer an obligation to go through the Better Regulation Clearance process. This in turn, removes the need to produce an Impact Assessment (IA) or gain Regulatory Policy Committee, Reducing Regulation Committee or Economic Affairs Committee clearances.

Having addressed the various objections and issues that have been raised in the consultation process, it is recommended that Variable Mandatory Speed Limits are implemented on the M60 – M62 between Junctions 8 and 20.

Annex A: Evidence Base

Business need

M60 Junction 8 to M62 Junction 20

The M60 J8 to M62 J20 corridor is approximately 17 miles (approx. 27km) long and has 11 junctions along the route. It is a mix of D2M, D3M and D4M, with significant Average Annual Daily Traffic (AADT) flows and peak hour flows up to 2,200 per lane (2010 observed flows).

A combination of closely spaced junctions, four of which intersect with the wider Strategic Network (M602 / M62, M61, M66 / M60 and A627(M)) and high traffic flows account for the large proportion of operational issues on the network. This is accompanied by poor signage and poor driver behaviour which compounds the problems observed.

Analysis of the accident data for this section of the motorway showed that during the during peak periods:

- 50 % of accidents are “nose to tail”
- 27% of accidents are due to “poor lane change”
- 41% of accidents occur on wet roads – national average is 32% for motorways

Almost half the links exceed HA intervention level for accidents.

Scheme history

In January 2009, the Secretary of State announced that work on the M60 J15 to 12 Lane Gain, work on M60 J8 -12 and work on the M62 J18 to 20, the other Manchester Smart Motorway schemes should start construction in the following two years (2010/11 and 2011/12). However these proposals were put on hold following the General Election of spring 2010 and the appointment of the coalition government.

At the end of October 2010 following the completion of the Comprehensive Spending Review the Secretary of State announced that he expected 14 major projects to enter construction during the proceeding 4 years, with a further group developed with a view to construction proceeding in the period from 2015. This group of 14 schemes included the three Manchester Smart Motorway schemes (M62 J18 to 20 Smart Motorway scheme, M60 J15 to 12 Lane Gain and M60 J8 to 12 Smart Motorway).

Following the SR10 announcement a study of the performance of the existing network was conducted to ensure that the proposals for the M60 J8-12, M60 J15-12 and M60 J18-20 addressed the issues that exist on the network. The outcome of the study concluded that the three individual schemes did not address all the key congestion seed points on this section of the road network and a review of the operational concept was required. Furthermore, adding significant capacity to the network could make the individual schemes undeliverable due to air quality effects.

The review concluded that a corridor approach which included introducing a smart motorway operational regime to all links between M60 J8 and M62 J20 would address the key congestion points as well as offering an opportunity to improve on the benefits already

identified. Introducing smart motorway on the corridor as a single scheme would also realise additional efficiencies.

As such the M60 J8-12, M60 J15-12 and M60 J18-20 are now being progressed as the Manchester Smart Motorway scheme. Ministerial approval for this single scheme approach was provided on 21st February 2013.

The problems to be addressed:

The M60 and M62 Manchester Outer Ring Road between M60 Junction 8 and M62 Junction 20 is an integral part of the main east-west transport corridor in the North West, linking Merseyside and Greater Manchester with Yorkshire and Humberside.

The route is of the highest strategic importance serving both national and international traffic movements, including access to both Manchester and Liverpool airports.

The motorway carries a large volume of traffic with a diverse range of origins and destinations and fulfils two distinct roles - providing for national and inter-regional Trans-Pennine traffic using the M62 and providing for regional and sub-regional orbital traffic using the M60 around Greater Manchester.

The whole length of the carriageway between M60 Junction 8 and M62 Junction 20 is under considerable stress and the close spacing of junctions combined with the large volume of traffic using the motorway for short distances results in a considerable amount of lane changing, often causing significant disruption to traffic flow.

The scheme runs through the Greater Manchester Air Quality Management Zone, which is already non-compliant with the EU Ambient Air Quality Directive (2008). Following an Air Quality assessment undertaken in December 2012, the original scope of the scheme, as announced in SR10, was assessed as having a 'significant' impact on air quality.

In July 2013 Ministers approved proposals to mitigate these air quality impacts by moving forward in two phases of work. Phase 1 will deliver Controlled Motorway between M60 J8 to 18 and Smart Motorway All Lane Running on the section of M62 between J18 to 20. This revised scheme design has reduced the Air Quality impact for Phase 1 to neutral. Controlled Motorway does not add additional capacity to the network, but by smoothing traffic flow it is predicted to make journey times more reliable.

Phase 2 will be progressed in parallel and will develop and review options to deliver an increased capacity scheme between M60 J8 to 15.

The design consultant, Hyder Halcrow Joint Venture were procured through the HA Project Support Framework. The contract for construction was awarded to a joint venture between Balfour Beatty, Costain, Carillion and Morgan Sindall.

Development of the Scheme

In addition to the preferred Phased Approach option, six other options for the scope of the Manchester Smart Motorway scheme have been identified, considered and assessed.

The six options assessed were as follows:

- Option 1 Do Nothing Baseline (i.e. Existing)
- Option 2 Managed Motorway 1 (Dynamic Hard Shoulder on M60 J8 to 12 and M62 J18 to 20 with an additional lane on M60 J15 to 12 anti-clockwise carriageway)
- Option 3 Controlled Motorway solution for the whole corridor
- Option 4 Managed Motorway 1 excluding M60 J15 to 18 (Dynamic Hard Shoulder)
- Option 5 Managed Motorway 1 (Dynamic Hard Shoulder) with controlled motorway between M60 Junction 15 to 18
- Option 6 Managed Motorway All Lane Running with controlled motorway between M60 Junction 15 to 18

Full details of these options can be found below.

These options were assessed and tested against the then current air quality assessment criteria LAQM TG (09). Option 6 met the assessment criteria and was taken forward as 'the preferred option'. However, in assessing this preferred option against newer guidance (IAN 170/12) this option was considered to have significant air quality impacts.

In July 2013 Ministers approved proposals to mitigate these air quality risks by adopting a phased approach. Phase 1 will deliver Controlled Motorway between M60 J8 to J18 and Smart Motorway-All Lane Running on the section of M62 between J18 to 20. This revised scheme design has reduced the Air Quality impact for Phase 1 to neutral.

Phase 2, to be progressed in parallel, will review options to deliver an increased capacity scheme between M60 J8 to 15. It is anticipated that Phase 2 will require a Development Consent Order (DCO) application through the planning consent process to mitigate air quality impacts.

A total of 7 options for revising the scope of the Manchester Smart motorway scheme have been identified and are described in the Business Case that has been prepared for the scheme.

1. Option 1 Do Nothing Baseline i.e. Existing *NOT RECOMMENDED*

The Do-Nothing Baseline, or existing situation, is a dual three (D3M) and dual four (D4M) lane carriageway to motorway standard with the MIDAS system (Motorway Incident Detection and Automatic Settings);

2. Option 2 Smart Motorway 1 (Dynamic Hard Shoulder on M60 J8 to 12 and M62 J18 to 20 with an additional lane on M60 J15 to 12 anti-clockwise carriageway) *NOT RECOMMENDED*

This was the original option to provide additional capacity to improve the traffic flow by introducing dynamic hard shoulder running at either end of the corridor and an extra lane on the anti-clockwise carriageway between M60 J15 and 12. This option did not include the later added section of M60 between J15 to 18. The option was not taken forward because an operational review concluded that the scheme was not addressing the key congestion points located on this section of the network.

3. Option 3 Controlled Motorway solution for the whole corridor

NOT RECOMMENDED

This option was developed to minimise the provision of additional capacity while improving traffic flow by introducing controlled motorway technology (variable mandatory speed limits and lane signalling) in place of the dynamic hard shoulder running in the pre-SR10 schemes. The additional lane in the pre-SR10 design for the anti-clockwise carriageway of the M60 J15-12 was replaced by hard shoulder running/controlled motorway. This option was not considered to be economically viable as controlled motorway does not deliver journey time savings and it was concluded that this option would not have a sufficiently high Benefit Cost Ratio (BCR).

4. Option 4 Smart Motorway 1 excluding M60 J15 to 18 (Dynamic Hard Shoulder) *NOT RECOMMENDED*

This option was developed to provide greater confidence that the design would deliver an acceptable BCR, by adding in carefully targeted sections of dynamic hard shoulder running to the scope of Option 3. As the updated traffic model had not yet been validated an assessment was made to determine the DHS links to be included which would provide the greatest benefit. These were added to the base controlled motorway scheme. The section between J15-18 was excluded from this option to ensure consistency with the original scope of the three schemes.

5. Option 5 Smart Motorway 1 (Dynamic Hard Shoulder) with controlled motorway between M60 Junction 15 to 18 *NOT RECOMMENDED*

This option was developed to tackle all the key congestion points between J8-20 by introducing controlled motorway from M60 J15-18 at an additional cost in the region of £15 million. The option included the scope of Option 4 with the addition of controlled motorway infilling from M60 J15-18. An optimum point was determined at which the scheme would be expected to deliver sufficient economic benefits to be viable but that minimised the increase in air pollution. The benefits of the Option 4 MMM scheme, though anticipated to be lower than at SR10, were still considered likely to be sufficient, alongside efficiency savings, for the schemes to represent high value for money.

This option involves allowing the hard shoulder to be used as a running lane on a temporary basis only when traffic flows are sufficiently high to require it. As with the preferred MM-ALR option, MM1 also incorporates MIDAS and Controlled Motorway (CM), with the CM system automatically setting lower speed limits (Variable Mandatory Speed Limits VMSL) as traffic flows and density reach critical levels. The essential difference compared to MM-ALR is that the hard shoulder can only be opened to traffic by the control room operators initiating the necessary signal sequences on variable message signs. This facility is only enabled when the CM system has reduced the speed limit to 60mph or less. The operator should then close the hard shoulder when the traffic volume has reduced to the extent that speeds on the normal three lanes would be in excess of 60mph. The CM system cannot remove the 60mph limit until the hard shoulder has been closed.

Preliminary cost estimates for the MM1 option indicated that it was approximately 15% more expensive than the preferred MM-ALR option. This is primarily because of the additional signalling required to safely open and close the hard shoulder. With regard to the benefits of MM1, these will inevitably be less than that for MM-ALR. This is because the hard shoulder in MM1 can only be brought into use when flows on the three normal lanes have increased to the extent that a 60mph limit is imposed by the CM system. With MM-ALR however, the same flow levels would be spread across four lanes, producing lower traffic density and higher lane speeds than MM1. These higher speeds would be maintained unless and until traffic flow and density on MM-ALR increases to the point that it is necessary for the CM system to impose a 60mph limit (at which point MM1 and MM-ALR would have the same average speed).

Before the MM1 option was taken forward a new design standard referred to as MM ALR was introduced following the publication of IAN 161. This was followed by a directive that all schemes being developed with a start of works in or after 2013 would be adopting these new standards. Manchester Managed Motorways was covered by this instruction.

6. Option 6 Smart Motorway All Lane Running with controlled motorway between M60 Junction 15 to 18: *PREFERRED but NOT DELIVERABLE*

The preferred option was SM-ALR and involves conversion of the existing hard shoulder to a permanent running lane. SM-ALR includes the system known as Controlled Motorway (CM), which also includes a sub system known as MIDAS (Motorway Incident Detection and Automatic Settings).

The two alternative means of increasing traffic capacity are widening of the carriageway, or introduction of the next and highest level of motorway control technology known as the Smart Motorway (MM) system. Both alternatives include MIDAS and CM technology, the essential difference being that SM relies on use of the hard shoulder rather than physical enlargement to provide additional traffic capacity.

Smart Motorway (MM) takes CM a stage further by reducing congestion and journey times, as well as improving journey time reliability. With SM-ALR, this is achieved by converting the hard shoulder to a permanent running lane. This increases the available road space and thereby reduces the density of traffic (the number of vehicles per unit length of road). This reduced density allows traffic to travel at higher speeds whilst still maintaining a safe headway distance between themselves and the vehicle in front. The higher speeds mean reduced journey times.

In order for the CM element of MM-ALR to be successful, it is essential that the variable speed limits which form part of the CM system are complied with. This requires the speed limits to be mandatory. Secondary legislation is required to allow mandatory variable speed limits to operate. Secondary legislation is also required for conversion of the hard shoulder to a running lane.

This was not an option taken forward due to the environmental impacts. The air quality assessment for the Manchester Managed Motorway scheme undertaken in December 2012 determined that the implementation of this option would lead to a significant environmental impact due to a worsening of Air Quality.

Preferred option

7. Option 7 Controlled Motorway on M60 between J8 to 18 and Smart Motorway All Lane Running on M62 Junction 18 to 20: *RECOMMENDED*

This option was developed to mitigate significant air quality risks.

Ministers were advised on 16th July 2013, to mitigate significant air quality risks, that the MSM scheme will move forward in two Phases of work. Phase 1 is to deliver Controlled Motorway (CM) between M60 J8-18 and with SM-ALR provided on the section of M62 between J18-20. This option is the phase 1 work.

Phase 2 is being progressed in parallel and will review options to deliver an increased capacity scheme. It is expected this will accompany a Development Consent Order (DCO) application through the planning process and is planned for delivery in 2015/16.

The Highways Agency introduced the concept of Managed Motorway All Lane Running, now Smart Motorway All Lane Running, in March 2012 as the single option for all future MM schemes, including the M60 – M62 J8-20 scheme.

The Smart Motorway Scheme aims to deliver a number of benefits. It is anticipated that it will;

- Support and enhance the role of the current M60 and M62 as a major national and inter-urban regional transport artery;
- Increase capacity, reducing congestion and improving journey time reliability;
- Provide additional capacity within the existing highway boundary;
- Support HA maintenance requirements and minimise whole life costs;
- Provide value for money against it's whole of life costs in accordance with the Department's WebTAG guidance;
- Make best use of existing infrastructure;
- Improve quality of information provided to drivers.

Specific Measures include:

- Conversion of the hard shoulder to become a full time running lane on the M62 between Junctions 18 and 20;
- Variable mandatory speed controls to regularize traffic flows during periods of congestion;
- Overhead gantries after each entry merge providing speed control information;
- Subsequent verge signals will repeat this information approximately every 800m;
- Signals will be used to control incidents on the carriageway;
- Slip roads will be improved where justified;
- Emergency Refuge Areas (ERAs) will be included on both carriageways between Junctions 18 and 20;
- Works in the central reserve to install concrete barrier in most sections;

-
- Lighting requirements have been assessed;
 - Environmental Assessments have been made;
 - Safety Assessments have been made.

The effect of introducing the Smart Motorway Scheme

The environmental assessment has adopted the methodology contained in the HA Design Manual for Roads and Bridges (DMRB) Volume 11, Interim Advice Note (IAN)125/09, Supplementary guidance for users of DMRB Volume 11, IAN 161/12 and IAN 161/13: Managed Motorways – All Lane Running.

The environmental assessment has determined that a statutory Environmental Impact Assessment is not required for this scheme. A Notice of Determination to this effect was published on 13 February 2014

An economic assessment has been carried out in accordance with the relevant guidance documents IAN 108/08, IAN 164/12, DMRB and WebTAG.

The economic inputs are derived from the Greater Manchester SATURN model redeveloped and validated in 2011. The proposals have been assessed for a 60 year period from the first year of scheme opening. Liaison has been undertaken with TfGM, the Greater Manchester local authorities and those of neighbouring counties. These consultations have identified both planned and aspirational development proposals and these have been incorporated into the transport model

Economic Assessment mainly involves the determination of the costs and benefits of the scheme using traffic flows and speeds obtained from the traffic model. The assessment excludes night time, weekend and Bank Holiday benefits, so the calculations may understate the true benefits. Costs can be defined as the total amount of money spent on constructing and maintaining the scheme.

Benefits can be defined as the total savings in terms of the following:

- Changes in journey times
- Changes in the costs of operating vehicles
- Changes in accidents
- Changes in maintenance delay
- Changes in delays during construction (always a dis-benefit, and recorded as a negative benefit)
- Changes in indirect taxes
- Changes in journey time reliability
- Changes in noise
- Changes in air quality

When a scheme is implemented the majority of benefits are usually demonstrated to be positive, however, some of them can be a negative benefit (disbenefit).

Costs and benefits are compared to determine whether the scheme represents good value for money. The costs and benefits are assessed over a 60 year period from the first year of the scheme opening

The appraisals have been undertaken using industry standard computer programmes TUBA (Transport User benefit Appraisal), MYRIAD (Motorway Reliability, Incidents and Delays), COBA (Cost Benefit Analysis) and QUADRO (Queues and Delays at Roadworks).

- TUBA was used to assess travel time savings by multiplying those savings by monetary values
- TUBA was also used to assess Vehicle Operating Costs (VOCs) which is a mixture of increases and decreases, due to changes in fuel consumption and changes in distance travelled
- COBA was used to assess accident benefits by multiplying predicted increases or decreases in accident numbers by their cost
- QUADRO was used to assess accident benefits by multiplying predicted delays by monetary values
- QUADRO was also used to assess maintenance delay benefits by multiplying predicted increases or decreases by monetary values
- MyRIAD was used to assess changes in Journey Time Reliability by multiplying predicted changes in reliability by a monetary value
- Standard environmental spreadsheets were used to assess monetary impacts of the scheme on Greenhouse Gas emissions, Noise and Air Quality

Cost Benefit Analysis

- The scheme has an initial BCR¹ of 2.06, comprising a Present Value of Benefits (PVB) of £435m and a Present Value of Costs (PVC) of £211m, at 2013 prices. The largest benefits are to business users (£280m) and accidents (£98m), while there is a large monetised disbenefit from increased Green House Gas emissions (-£35m). The monetised analysis also includes disbenefits from noise and air quality.
- The adjusted BCR of the scheme takes into consideration monetised impacts of factors such as reliability which are less robust. Reliability benefits have been assessed as £169M, which if added to the scheme benefits would provide an adjusted BCR of 2.86.
- Low and high traffic growth sensitivity tests have been carried out around the central forecasts. The travel time and vehicle operating costs saving for the central forecast is about £471m, for the low/high growth sensitivity test is about £317m and £540m respectively. Therefore in comparison to the Central growth forecast, the benefits reduce by 33% in the low growth scenario and increase by 15% in the high growth scenario respectively. Under assumption that the other monetised impacts are unchanged then the BCR would range from 1.9-3.1.

¹ The initial BCR refers to the BCR before adjustment for less robust factors like reliability and Wider Impacts, not to the stage of scheme development.

Analysis of Monetised Costs and Benefits (£000s)

Analysis of Monetised Costs and Benefits		
Noise	-£3,016	(12)
Local Air Quality	-£616	(13)
Greenhouse Gases	-£35,199	(14)
Journey Ambience		(15)
Accidents	£97,862	(16)
Economic Efficiency: Consumer Users (Commuting)	£29,527	(1a)
Economic Efficiency: Consumer Users (Other)	£44,673	(1b)
Economic Efficiency: Business Users and Providers	£280,424	(5)
Wider Public Finances (Indirect Taxation Revenues)	£21,353	- (11) - sign changed from PA table, as PA table represents costs, not benefits
Option Values		(17)
Present Value of Benefits ^(see notes) (PVB)	£435,008	$(PVB) = (12) + (13) + (14) + (15) + (16) + (1a) + (1b) + (5) + (17) - (11)$
Broad Transport Budget	£211,622	(10)
Present Value of Costs ^(see notes) (PVC)	£211,622	$(PVC) = (10)$
OVERALL IMPACTS		
Net Present Value (NPV)	£223,386	$NPV = PVB - PVC$
Benefit to Cost Ratio (BCR)	2.06	$BCR = PVB / PVC$
<p>Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.</p>		

Summary of Economic Assessment Components

Impacts	Source	Monetary Value (£000's)
User Benefits	TUBA assessment of AQ Option 1	471,054
Delays during maintenance	QUADRO assessment of main scheme	3,326
Delays during construction	QUADRO assessment of Phase 1 TM plans	-119,756
Operating Costs	MMOCCM	34,893
Accidents	Assessment of AQ Option 1	97,826
Noise	Assessment of AQ Option 1	-3,016
Local Air Quality	Assessment of AQ Option 1	-616
Greenhouse Gases	Assessment of AQ Option 1	-35,199
Scheme Capital Cost	HA Commercial converted to PVC basis	176,729
Reliability	MyRIAD assessment of AQ Option 1	169,476

Non-Monetised Benefits

There are a number of impacts which it is not possible to monetise, but which should be taken into account.

Air Quality

The scheme affected road network runs through four local authorities across Greater Manchester between M62 J18-20 (M60 J16-18). The Greater Manchester Air Quality Management Area (AQMAs) covers the majority of the major road network in the study area including the M60 and M62. There are air quality improvements at 130 receptors that either are in exceedence of air quality objectives in both scenarios, or are removed from exceedence as a result of the scheme. The scheme results in worsening air quality at 56 receptors that are in exceedence in both scenarios, or that exceed as a direct result of the scheme. The change at the majority of receptors is between -2 & +2 µgm. NOx emissions increase as a result of the scheme by 0.8 Tonnes in the Opening year. PM10 emissions increase by 45 kilograms in the opening year.

Landscape and Townscape

Localised impacts due to cumulative effects from vegetation clearance, introduction of additional & replacement gantries, HADECS3 system, retaining walls & grillages and adjustment of existing lighting within the existing space-constrained motorway boundaries. Scheme-wide the landscape character effects are typically insignificant, in context with the existing motorway and associated infrastructure, but locally some effects increase to moderate.

Localised impacts due to cumulative effects from vegetation clearance and introduction of additional and replacement gantries, HADECS3 system, retaining walls & grillages and adjustment of existing lighting within the existing space-constrained motorway boundaries. Scheme-wide the townscape character effects are typically insignificant, in context with the existing motorway and associated infrastructure, but locally some effects increase to moderate.

Heritage and Biodiversity

No designated archaeological remains within the Highways Agency boundary. Very unlikely to see direct impacts on non-designated buried archaeology. Clusters of listed buildings and structures around Junction 13, including a Scheduled Monument. A further SM, Wardley Hall, lies adjacent to J14. Effects on designations will be indirect impacts on settings from the proposed placement of gantries.

Minor loss of habitats within motorway soft estate of plantation woodland, scrub and grassland, with impacts predicted as neutral following reinstatement planting. Following mitigation measures for bats, great crested newts and breeding birds impacts to fauna is predicted as neutral.

Noise

Changes are either No Change or Negligible (0 - 2.9dB), approx. Two-thirds are a decrease in noise. Changes are caused by changes in traffic flow and use of hard shoulder. Increases are caused by a scheme from another Overseeing Organisation. Night-time impacts would be similar to daytime. 1,730 properties exposed to a level above 68 dB LAeq. SDI appraisal indicates adverse impact in all social groups plus for children and young people.

Water

Water environment features are typical of the locality. There will be very little change from the existing situation with the minor impacts resulting from new impermeable surfacing.

Social effects

Scheme will not change the number of pedestrian or cyclist journeys or change journey length; as a consequence no material impacts anticipated.

Variable message signs to provide clear and unambiguous information to the driver - this would serve to reduce driver stress. Traveller Views: increased awareness of the motorway due to frequency of additional infrastructure (nominal under ALR regime). Whilst MM ALR reduces availability of hard shoulder on M62 J18-20, the provision of ERAs and higher levels of monitoring and control should improve security for road users. Up to 180,000 vehicles per day on M60.

The scheme does not affect the provision or location of transport facilities and hence access to transport is unaffected.

Whilst the scheme reduces congestion and delays, the resulting improvements in speeds produces an increase in vehicle operating costs for road users. The distributional analyses indicate the impact on affordability is moderately adverse across all groups with the exception of the 20% most income deprived, who have a large adverse impact.

Between junctions, people can only cross the M60/M62 using grade separated facilities that are unaffected by MM operation. Some junctions experience a slight increase in traffic flows which may affect pedestrians crossing these roads.

Transport availability is unaffected by the scheme.

Better Regulation

On 23 November 2012, DfT Better Regulation Team advised HA that managed motorway schemes with an approved business case that required regulation to enforce mandatory speed limits were out of scope of *One In One Out*. As a consequence, there is no longer an obligation to go through the Better Regulation Clearance process. This in turn, removes the need to produce an Impact Assessment (IA) or gain Regulatory Policy Committee, Reducing Regulation Committee or Economic Affairs Committee clearances. It also removed the requirement for MM Sis to be included on the Statement of New Regulation.

Although the exemption has been granted, the statutory elements of Consultation on the Introduction of Variable Mandatory Speed Limits (VMSL), and the laying of the Statutory Instrument before Parliament are still to be adhered to.

Human Rights

The Smart Motorway scheme will not have an adverse effect on Human Rights.

Enforcement

The legislation does not introduce any new offences or sanctions and VMSL will be enforced using gantry and verge mounted speed enforcement cameras.

In smart motorway schemes the enforcement of the speed limits will use the Highways Agency Digital Enforcement Camera System (HADEC). The digital photographs are transmitted electronically to a Police Fixed Penalty Office (FPO) where the offending drivers are identified and the appropriate action taken. However, experience has shown that a relatively small number of offenders will have to be processed through the Magistrates' Courts. The complete process impacts on the Highways Agency, Police, Crown Prosecution Service (CPS) and HM Courts Service.

This has been dealt with by an agreement between the four parties (Managed motorway National Enforcement Strategic Agreement, December 2009).

Offences captured by HADEC are processed with financial support from the Highways Agency by virtue of Section 38 of the Vehicle (Crime) Act 2001. This enables the Secretary of State to fund Police and others to support the enforcement of the non-compliance with posted variable speed limits.

Consultation

A consultation has taken place with affected stakeholder groups and interested parties. Stakeholder feedback has been assessed and the results from the consultation published.

Summary and Recommendations

The M60 Junction 8 to M62 Junction 20 Smart Motorway Scheme has the potential to produce considerable benefits by aiming to reduce congestion, improve journey time reliability and reduce the number of personal injury accidents.

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

© Crown copyright 2014.

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence: visit www.nationalarchives.gov.uk/doc/open-government-licence/ write to the Information Policy Team, The National Archives, Kew, London TW9 4DU or email psi@nationalarchives.gsi.gov.uk

This document is also available on our website at www.highways.gov.uk

If you have any enquiries about this publication email ha_info@highways.gsi.gov.uk or call **0300 123 5000***
Please quote the Highways Agency publications code **PR37/14**

Highways Agency media services Manchester. Job number N140218

* 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 pay-phone. Calls may be recorded or monitored.