

## ENRICO PETRUCCO

### WRITTEN REPRESENTATION

#### HIGHWAYS ENGLAND RESPONSE

1. *I am interested to understand more about the proposed M4 scheme and I would like a chance to comment on proposals to make the M4 a 'Smart Motorway'. Please could you schedule an Open Floor Hearing in Reading? I will be available to attend any evening session from Nov 17-19.*
  
2. *It seems evident that a "Smart Motorway" is a good plan to smooth M4 traffic, reduce congestion, and reduce total vehicle emissions. However it seems excessive costs will be incurred to enact the "widening" portion of the plan and will likely result in an illegal increase in emissions at specific nearby areas.*

#### Highways England Comment

- 2.1 It is important to note that the M4 junctions 3 to 12 smart motorway scheme (the "Scheme") is not a widening project, but involves the improvement of the M4 motorway between these junctions to provide a smart motorway with all lane running, by the permanent conversion of the hard shoulder to a running lane. The Scheme has been subject to detailed appraisal covering a wide-range of potential impacts on the wider community. The assessment followed the guidelines for appraisal set out in Treasury guidance (The Green Book, Appraisal and Evaluation in Central Government) and as laid down for transport projects in the Department for Transport's ("DfT") Transport Analysis Guidance ("TAG"), the Design Manual for Roads and Bridges ("DMRB") and supplementary advice in the form of Interim Advice Notes ("IAN") published by Highways England.
  
- 2.2 The costs of the Scheme, including the capital, construction impacts and operational costs (which includes the costs of converting the hard shoulder to a running lane) are compared against a range of benefits, covering travel-related benefits (principally travel time and reliability), safety, regeneration, and a range of environmental impacts (air quality, noise, greenhouse gases, land and townscape, heritage, biodiversity and water), physical activity and journey quality. Where possible, these effects are monetised for direct comparison with the costs associated with provision of the Scheme. The results of this assessment are brought together in an Appraisal

Summary Table (“AST”), a copy of which is provided in Appendix B of the Socio-Economic Report for the Scheme (Application document reference 7-2).

- 2.3 The AST, together with supporting worksheets, has been submitted to the Transport Appraisal and Strategic Modelling and Road Economics teams within DfT, which have undertaken a Value for Money (“VfM”) assessment. The metric used to define the VfM for the Scheme (or any other investment) is the ratio of the total net benefits divided by the total net costs, called the Benefit Cost Ratio (“BCR”). Taking account of all the costs and benefits, the Scheme has been assessed as having a BCR of 2.2, which affords the Scheme a rating of high value for money.
- 2.4 Furthermore, with regards to emissions, whilst there will be a slight increase in air pollution as a result of the Scheme, the overall assessment of effects indicates that air quality effects are not significant, both along the length of the Scheme and on the local road network. These conclusions are reported as part of the Air Quality assessment for the Scheme, which is provided in Chapter 6 of the Environmental Statement (“ES”) (Application Document Reference 6-1), paragraph 6.15.16 and Tables 6.21 and 6.22.
3. *The plan to operate a continuous running hard shoulder is unnecessary and unsafe. Advice from motoring organisations was not sufficiently taken into account and the plan has been designed with only the absolute minimum of safety requirements by regulation rather than according to available data.*

#### Highways England Comment

- 3.1 Paragraph 4.1.1 of the Engineering and Design Report (“EDR”) (Application Document Reference 7-3) explains why the Scheme is necessary in order to manage traffic flow on the M4. *“The M4 between junctions 3 and 12 carries over 130,000 vehicles per day, and more in places. At peak times, traffic flows on many links are close to or exceed the total flow that the link is designed to handle and traffic on the M4 therefore suffers from heavy congestion, which leads to unpredictable journey times. Although traffic volumes reduced in 2008 at the start of the global financial crisis, long-term traffic trends still show significant growth. Traffic flows are forecast to increase to an average of 160,000 vehicles per day over the next 20 years, which, without road improvement, will result in more severe congestion”.*

- 3.2 With regard to safety, the Scheme will deliver the additional capacity required without compromising overall safety. 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 smart motorway pilot scheme (“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.
- 3.3 The Hazard Log report, Annex E of the EDR, outlines the hazard analysis work undertaken and concludes that the Scheme’s all lane running (“ALR”) design is likely to result in a reduction in risk of 8% when compared with the existing M4 motorway, and is predicted to result in a reduction of risk of 18% when compared with the safety baseline (a motorway with no motorway incident detection and automatic signalling (“MIDAS”) queue protection). Annex E concludes that the Scheme can expect *“A reduction in risk for 13 of the 17 highest scoring existing motorway hazards due to a controlled environment being provided through a combination of regularly spaced variable mandatory speed signals, speed enforcement, and full closed circuit television (“CCTV”) coverage.”*
- 3.4 It is not correct that the Scheme has been designed to the minimum safety standards. On a conventional motorway, vehicles should only stop on the hard shoulder if there is an emergency, such as a breakdown. On the Scheme, such vehicles will be able to stop in an emergency refuge area (“ERA”). An ERA is safer than the hard shoulder and, in most cases, it is to be expected that a vehicle could reach an ERA. The average spacing between ERAs will be 1.14 miles (1.85km) as detailed in section 2.2 of Annex E of the EDR (Application Document Reference 7-4). This is more frequent and hence more accessible than the 2.5km maximum spacing outlined with the smart motorway all lane running (“ALR”) design standard, which takes account of safe design and is set out in Interim Advice Note (“IAN”) 161/13.
- 3.5 The emergency services and the recovery industry (including the AA and RAC) are key partners for Highways England and have been involved from the outset with the development of the ALR concept. The comment that advice from motoring organisations has not been sufficiently taken into account is not accurate. The following paragraphs explain how Highways England have listened to the views of

motoring organisations and taken them into account in the development of the ALR concept and in relation to the specific proposals for the Scheme.

- 3.6 In 2013, Highways England established an “Operating Smart Motorways” steering group and a number of subsidiary working groups, with the emergency services, Driver and Vehicle Standards Agency (“DVSA”) and the recovery industry. The AA and RAC attended on behalf of the recovery industry. The key objective of these groups was to agree how they would operate on smart motorways in order to carry out their normal activities, including emergency response to incidents. These groups have now concluded, and operating agreements are in place for smart motorways with the various groups described.
- 3.7 The AA and RAC also meet with Highways England on a regular basis in a number of forums, including the national Survive working group. They have been briefed on the smart motorway proposals across the network through this forum, and the Survive Best Practice Guide is being re-issued to all recovery agents to enable them to operate safely on smart motorways.
- 3.8 The views of the recovery industry have been listened to carefully by Highways England via the consultation described above and a significant amount of work has been done to ensure that this service can continue to operate safely and effectively. The current Institute of Advanced Motorists (“IAM”) Policy for smart motorways shows that they are in support of the smart motorway concept. The policy states “*The IAM support SMART motorways, studies show most drivers like them and they reduce congestion flow without jeopardising safety*” (Ref: <http://iam.org.uk/policymanagedmotorways>).
- 3.9 In addition to this consultation relating to the development of the ALR concept, motoring organisations have been consulted in relation to the Scheme. The Consultation Report (Application Document Reference 5-1) notes that “*Local or national vehicle recovery operators potentially impacted by the works, such as the RAC, AA, Britannia Recovery*” were sent a letter, provided at Appendix 3 of the Consultation Report, inviting them to public information exhibition events in March 2014. Additionally, the motoring organisations were also included within the consultation under section 47 of the Planning Act 2008 in November 2014.
- 3.10 The table below sets out the motoring organisations that were identified and consulted in these ways.

AA Limited
ACFO Limited
Association of Industrial Road Safety Officers
Association of Vehicle Recovery Operators
AXA Assistance (U.K.) Limited
BRAKE
Britannia Rescue
FMG Support Limited
Green Flag Limited
Institute of Vehicle Recovery
RAC Limited / RAC Motoring Services
Road Haulage Association Limited
Road Rescue Recovery Association
Road Safety Support Limited
Royal Automobile Club Foundation for Motoring Limited
The Alliance of British Drivers
The Royal Society for the Prevention of Accidents

- 3.11 Only two of these organisations responded to consultation on the Scheme. The Road Haulage Association ("RHA") Limited and AA provided a response to the section 47 consultation setting out their policy position on smart motorways and their views on the principles of the ALR design. The RHA also stated "*We welcome plans to introduce a smart motorway between junctions 3 and 12 of the M4 as a means of addressing congestion on this section of motorway*", but also raised some concerns relating to enforcement which were specific to the Scheme. These were considered and responded to in Appendix 31 of the Consultation report (reference 272). The response to RHA advised that the Scheme will introduce camera enforcement along with other measures including road safety education, display of accurate information through the signs and signals and the presence of Highways Agency Traffic Officers. The response to RHA also noted that through these measures it is anticipated that an acceptable level of compliance will be achieved.
- 3.12 Motoring organisations were also consulted in relation to Variable Mandatory Speed Limits for the Scheme. Appendix 33 of the Consultation report details the consultees, responses received and Highways England's responses in respect of this consultation. Therefore it can be seen that Highways England have worked closely with the motoring organisations and listened to their views to ensure that any concerns have been taken into account.

4. *A less expensive and still suitable option to operate a Smart Motorway with widening localised to junction ramp extensions without bridge work should be considered. Should it be found that bridge widening is necessary at some point in the future then a more comprehensive widening of the motorway with possible installation of an additional lane may be considered while retaining a hard shoulder.*

#### Highways England Comment

- 4.1 Over recent years several forms of technology have been introduced on the M4 between junctions 3 and 12 to help manage traffic on this congested section. This includes Ramp Metering, CCTV, MIDAS and message signs. However with these measures in place the forecast traffic flow during peak periods in substantial areas of the Scheme will approach or exceed the available capacity without the Scheme (see Table 2, Paragraph 4.3.3 of the EDR).
- 4.2 The Scheme aims to make maximum re-use of the existing infrastructure to provide additional capacity needed to manage forecasted traffic flows through permanently converting the hard shoulder of the M4 to a running lane supplemented by the use of new technology to manage traffic flow. The option of localised ramp extensions was not considered to be a suitable alternative solution because it would not provide the additional capacity created by converting the hard shoulder into a fourth lane. Widening of the bridges is a necessary outcome of implementing ALR, as the hard shoulder is discontinuous at those bridges that are proposed to be widened as part of the Scheme. The design evolution of the Scheme, which explains how the final design of the Scheme was selected is included in Chapter 5 of the EDR and Chapter 3 of the ES.
- 4.3 The option referred to in the representation of “*Comprehensive widening ... while retaining a hard shoulder*” is known as full or traditional widening. This can be done symmetrically, i.e. both existing hard shoulders converted into a running lane and a hard shoulders added along each side of the motorway, or asymmetrically, i.e. one hard shoulder retained with all the physical widening applied to the other side of the motorway. Traditional widening would require the extension or replacement not just of the bridges with hard shoulder discontinuities, but of virtually every bridge between junction 3 and junction 12, and would therefore have a much more significant impact, both in terms of the environment and compulsory acquisition. This is supported by the report ‘Action for Roads - A network for the 21st century’ (July 2013) compares the smart motorways concept to traditional widening. It notes that

“because of the way managed motorways work, they have many advantages over conventional widening. They can be introduced without the need to take large amounts of land. They have a significant impact on journey reliability and fewer environmental impacts. They can also be delivered at up to 40% less cost with improved safety.

5. *Before any action to increase capacity funds should be dispersed to connecting towns and cities to model the knock-on effects of increased traffic flux and results analysed.*

#### Highways England Comment

- 5.1 The respondent has argued that additional modelling of effects in areas close to the Scheme is required. It is suggested that *"funds should be dispersed to connecting towns and cities to model the knock-on effects of increased traffic."* This is unnecessary, because Highways England has already undertaken modelling in relation to those links and junctions likely to be affected by displaced or induced traffic resulting from the construction and operation of the Scheme. The modelling has concluded that no off-site works are required.
- 5.2 The impacts of the Scheme on traffic flows both on the M4 and on the local road network has been modelled as part of the Application for the Scheme. The computer forecasting model for traffic modelling, which is used by Highways England on all its major Schemes, also takes account of details of future developments provided by the local planning authorities and Highways England alongside national population and employment forecasts to assess the Scheme and its effects on the surrounding roads. The resulting model covers a wide area that has been divided into over 700 (717) sub-areas or zones, based on population, and over 42,000 (42,352) highway links. The modelling undertaken has concluded that the Scheme will both smooth traffic flows on the M4 motorway and produce a range of traffic and safety benefits to the wider community, as reported in the AST, presented as Appendix B to the Socio-Economic Report (Application Document Reference 7-2).
- 5.3 The local roads potentially affected by the Scheme were identified and assessed in the Environmental Statement, paragraph 6.1.13 of Chapter 13, Effects on All Travellers (Application Document Reference 6-1). In particular, Tables 13.4 and 13.5 identify the effects on local roads in the vicinity of the M4. The results of the assessment on these roads is set out in Tables 13.27 to 13.29 and summarised in paragraphs 13.8.6 to 13.8.9, which conclude overall that the impact is neutral.