

CAMPAIGN FOR BETTER TRANSPORT

WRITTEN REPRESENTATION

HIGHWAYS ENGLAND'S RESPONSE

M4 JUNCTION 3-12 SMART MOTORWAY (TR 010019) – SUMMARY OF REPRESENTATIONS MADE AT SPECIAL HEARINGS ON ENVIRONMENT AND SAFETY (WITH ADDITIONAL EVIDENCE)

ENVIRONMENT

1. TRAFFIC FORECASTING

- 1.1 *Campaign for Better Transport notes that Highways England explained that the three scenarios it has modelled its core traffic forecast relates to scenario 1 in the Road Traffic Forecasts 2015, while its high forecast relates to scenario 5 and its low forecast to scenario 4. This leaves two scenarios unaccounted for, both of which are lower than Highways England's core forecast. That suggests that the core forecast is too high and we believe the modelling should be re-run for scenario 3 to see how this would affect outcomes and the need for the scheme.*

Highways England Comment

- 1.1.1 The traffic forecasts for the M4 Smart Motorway were developed during 2014 and, as such, predate the issue of Road Traffic Forecasts 2015, which were published in March 2015. Both the model used to develop the Road Traffic Forecasts 2015 (the National Transport Model) and the M4 Smart Motorway model use data from the National Trip End Model. The M4 Smart Motorway model used data from the National Trip End Model version 6.2. It is to be noted that the footnote to Paragraph 1.18 of the Road Traffic Forecasts 2015 states:

"An update to NTEM is scheduled for early 2016 which will consider the latest evidence on trip rates. For the avoidance of doubt scheme promoters should continue to use NTEM v6.2 until the update is ready for use, taking into account the guidance under the WebTAG Proportionate Update Process." [emphasis added]

- 1.1.2 The future scenario referred to (Scenario 3) is one where recent declining trip rates are extrapolated into the future to 2040 (or until the point at which they would go negative). It differs from the other 4 scenarios presented in Road Traffic Forecasts 2015, in which trip rates are held at their 2010 levels in the forecasts. It is to be noted that Scenario 3, together with the other 4 scenarios, provides a range of possible outcomes over the period 2010 to 2040, which the Department for Transport has devised for assessing its strategies as stated at paragraph 1.4 of the Road Traffic Forecasts 2015:

"The forecasts are designed to provide a national view of possible future trends in road traffic and are used to analyse the implications of a variety of strategic level policy options on traffic levels, emissions and congestion. They provide a tool to understand the case for, and impact of, investment in the road network across the country as a whole, and other road transport policies." and, as continued at paragraph 1.5, "They are not and should not be used to appraise individual road

schemes, nor can they be used to consider the right level of capacity on a specific road or solutions to specific local issues. Analyses of specific schemes use bespoke models fitted to local conditions to inform decisions." [emphasis added]

1.1.3 As the guidance states, Highways England has used a bespoke, local traffic model to appraise the M4 Smart Motorway scheme in full accordance with the Department's requirements. The core scenario remains a valid one under RTF 2015 and has been supplemented by complementary high and low growth sensitivity tests in line with current guidance. This remains the appropriate basis on which to consider the case for the Scheme.

1.2 *Having said that, should the scheme be brought forward in its current form, which will see an increase in capacity of 25 – 33% in terms of running lanes, passing through heavily built up areas and near to urban centres, then we would expect there to be quite a high suppressed demand for road travel which will quickly fill up any new capacity. This induced traffic could be quite high and we are not convinced, given the road's location, that the level of induced traffic will be only 0.4% or thereabouts.*

Highways England Comment

1.2.1 Highways England notes that CBT offers no evidence or data to support its claims and no adequate reasons (and again no evidence) explaining why the work done by Highways England is unsatisfactory. The expectation of suppressed demand is no more than supposition.

1.2.2 In carrying out the modelling and forecasting for the Scheme, Highways England has followed guidance in paragraphs 4.3.9 to 4.3.15 in TAG Unit M1.1 – Principles of modelling and forecasting – that simple fixed demand approaches are "only valid where it can be demonstrated that changes in cost will not generate a noticeable change in demand (commonly called induced traffic)". In these circumstances, a full variable demand model form should be used. The M4 smart motorway model is a variable demand model that can account for changes in demand in the form of changes to mode of travel, time of travel, trip destination or indeed totally new trips, any of which could be valid responses to the Scheme. As such, Highways England considers that the estimate of induced traffic arising from the M4 smart motorway has been properly derived.

1.3 *This is important as the level of induced traffic is a measure of the impact of the scheme. The low level of induced traffic also feeds into the air quality and carbon emissions for the scheme and therefore its understatement will give a rosier picture of the scheme and hide its true impact.*

Highways England Comment

1.3.1 Highways England acknowledges the importance of correctly assessing the forecast traffic, including any induced traffic due to the assessments which are impacted by the results of the forecast. As noted above, Highways England has undertaken its forecasting in compliance with necessary standards and guidance, without understatement.

1.4 *We mentioned the report by Yaron Hollander, a former Transport for London modeller, who has identified a number of issues with the way modelling is carried out, the lack of scrutiny*

and understanding around modelling and the problems this can cause. The article in Local Transport Today¹ highlighted that quite often as long as the guidance is followed, there is no real scrutiny of the modelling and most claims or assertions by the proponents are taken as read.

Highways England Comment

- 1.4.1 The report – "Who will save us from the misuse of transport models?", CT Think, November 2015 – includes a plea for the public to "ask to see every detail of the modelling work behind public investments. In particular, the public can ask about all the assumptions made and possible outcomes that were modelled." This Examination provides this opportunity for that public scrutiny to take place. However, it is not appropriate for unsubstantiated critiques of a model to be made without any supporting evidence, analysis or modelling to counter the detailed modelling work that has been undertaken as part of the assessment of the Scheme.
- 1.5 *During the discussion, questions were asked around the value of time and whether by having fixed this in 2009, this might be too low. We highlighted latest research which shows many value of time rates are being suggested to be lowered for transport scheme appraisals and reliability of journey benefits slashed. This is likely to see all road schemes with reduced cost benefit ratios which will probably feed through into new WebTAG guidance in March 2016².*

Highways England Comment

- 1.5.1 An update to WebTAG guidance that reflects research undertaken on behalf of the Department for Transport into the values of time used for scheme modelling and appraisal is scheduled for publication as formal guidance in Spring 2016. It is correct to state that the research (Provision of market research for travel time savings and reliability, Phase 2 Report, Department for Transport, August 2015) recommends that many values of time be lowered.
- 1.5.2 However, the value of time spent commuting is recommended to be increased by 47%. Business travel time is to be varied by trip length, with a significant reduction in the value for car drivers on short-distance trips but trips in excess of 100kms being reduced by only 7%. Accordingly, the implications are difficult to predict save to suggest schemes with high proportions of local commuting and longer-distance business trips (such as the M4) will be least impacted.
- 1.6 *We support the Panel's call for a clear setting out of data and assumptions used in any modelling and we would urge that this is done in clear English, avoiding the use of jargon and acronyms wherever possible.*

Highways England Comment

- 1.6.1 Highways England confirms it has submitted a note at Deadline IV on the assumptions used in the preparation of its traffic forecasts in response to the Examining Authority's request (Examination Reference REP04-001 Appendix B).

¹ See Appendix 1

² See Appendix 2

1.7 *It is also worth noting that there was concern that Highways England's traffic model wasn't sensitive enough to highlight impacts on the local road network. We would agree with this and flagged up previous evidence that we had submitted on air pollution highlighting the inaccuracy of Defra's strategic air quality model which has been shown to be wildly inaccurate when trying to predict real-life pollution levels at a local level³.*

Highways England Comment

1.7.1 Highways England does not agree with the general statement that the traffic model is not sensitive enough to highlight impacts on the local road network. The traffic model has met the required standards for validation set within DMRB and TAG.

1.7.2 Model traffic volumes have been compared with observed values across 20 screenlines (lines bisecting roads across the model's study area). Total flows across these screenlines are within 3% of the observed total. The 20 screenlines comprise a total of 887 highway links. The validation requirement is that a minimum of 85% of the individual links on each screenline should achieve a set statistical 'goodness of fit' level. This requirement was exceeded at all screenlines. The model contains over 42,000 individual links and whilst it is not suggested that the model accurately replicates traffic flows on each and every one of these links, it has been validated to the required level for the assessment of the Scheme.

1.7.3 Defra's national air quality model has been used to provide background air quality data combined with detailed air quality modelling based upon the traffic data described above. Where possible, the Defra background mapping values have been cross-checked against monitoring data. This has enabled pollutant concentrations to be predicted at the local level.

2. AIR POLLUTION

2.1 *We outlined that there are four main factors affecting emission levels and these are:*

- *Fleet composition*
- *Current actual real life emissions*
- *Projected rate of improvement over time*
- *Modelled traffic levels*

2.2 *Given that the Department for Transport (DfT) states that the car fleet will continue to increase in its dieselisation⁴ this is going to lead to a greater increase in emissions from diesel vehicles over time.*

Highways England Comment

2.2.1 The predictions of car fleet composition used in the Scheme assessment have been taken from Government projections within the Emission Factor Toolkit.

2.3 *Secondly, given the VW scandal, it has become evident that real life emissions of vehicles are far higher than was thought, not just in older diesel engines, which might explain why*

³ Section 2.2 & Appendix 1, [Comments on Highways England's responses to Panel's 1st Written Questions](#) – 5 Nov 2015

⁴ Paragraph 3.58, page 53, [Road Traffic Forecasts 2015](#), March 2015

improvements in air quality have been hard to achieve in more recent years, but also in relation to the latest Euro 6 engines. These have been shown to have emissions well above the laboratory test limits in real life⁵ and consequently emissions are unlikely to drop as Highways England are assuming.

- 2.4 *In addition to the delay in phasing out new Euro 5 engines, which will now continue to be sold until September 2016, instead of September 2015⁶, it is proposed that the real-world tests to be introduced for Euro 6 engines won't be as strict as the laboratory tests. Any new models from September 2017 will be allowed to emit real-world emissions up to 110% higher than the laboratory test until January 2020. However, new vehicles of existing models, already approved and on the market, won't have to meet these new targets until September 2019, some two years later. This means that we are likely to have high polluting Euro 6 engines around for quite some time.*
- 2.5 *Beyond January 2020, new models will be allowed to emit up to 50% higher real-world emissions, while new vehicles of older models, won't have to meet this target until January 2021⁷.*
- 2.6 *All of these factors point to the fact that on going future rates in improvement are likely to be far less than previously envisaged and are unlikely to lead to a rapid improvement (at least initially) as modelled by Highways England. One reason, perhaps, why the Interim Advice Note (IAN) 170/12 v3 allows some discretion.*

Highways England Comment

- 2.6.1 Highways England has already made allowance for higher emissions than the prescribed standards through the use of LTT_{E6} as set in IAN 170/12 v3.
- 2.7 *In addition, the hearing heard from a number of air quality experts who stated that traditionally improvements in air quality had been consistently overestimated and urged caution in future projections. This combination of factors suggests that even if the Highways England profile LTTE6 (on the graph they distributed at the Issue Specific Hearing) is shifted to the right by several years it is still unlikely to accurately reflect real-world emissions. While Highways England described LTTE6 as the realistic 'worst' case they failed to provide any evidence as to why their projection represented an accurate or cautious approach to future trends.*
- 2.8 *However, given that much of the above has happened post the publication of the IAN 170/12 v3, we believe that the most pessimistic future trend (LTT) as shown on the Highways England graph supplied at the Issue Specific Hearing is a sensible and cautious approach to future improvements. It still represents a slight ongoing improvement but does not envisage any sudden improvements as Highways England's graph does.*
- 2.9 *If a robust approach is to be taken to air pollution and for there to be no challenge to any decision, the more pessimistic LTT graph should be used to work out future emissions levels and Highways England should be asked to produce revised data on air pollution.*

⁵ Sections 2 & 3, [Realistic real-world driving emissions tests: the last chance for diesel cars?](#), Transport & Environment July 2015

⁶ As mentioned by Hillingdon Borough Council's expert witness on air pollution at the Issue Specific Hearing, 17 November 2015

⁷ [European Commission Press Release](#), 25 September 2015

2.10 *We are concerned that this issue has been significantly downplayed in the portrayal of the scheme which is then affecting proper consideration of other options or the need for mitigation. If the air pollution was remodelled we would be surprised if it did not become a significant issue and affect a lot more houses along the route.*

Highways England Comment

2.10.1 The use of the LTT_{E6} projection curve is in recognition of the possibility that air quality is not improving as quickly as envisaged by Defra.

2.10.2 Even considering if Euro 6/VI does not achieve their emission standards they will still be lower than Euro 4/IV and 5/V vehicle emissions. Consequently therefore it is reasonable to assume some level of reduction in emissions in the future and not an almost static trend as described by LTT_{E6}. In adopting the LTT_{E6} approach, Highways England has still allowed for a greater level of uncertainty in future performance to enable the management of risk.

2.11 *However regardless of the issues above, there is still the question as to whether the scheme can delay compliance, even if not described as being significant by the Highways Agency.*

Highways England Comment

2.11.1 The Scheme's impact on air quality has been assessed in line with Government's published guidance set out in Interim Advice Note 174/13 'Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 'Air Quality' for the consideration of significant air quality effects, and Interim Advice Note 175/13 'Updated air quality advice on risk assessment related to compliance with the EU Directive on ambient air quality and on the production of Scheme Air Quality Action Plans for user of DMRB Volume 11, Section 3, Part 1 'Air Quality' for the judgement of risk to the UK's ability to comply with the Air Quality Directive.

2.11.2 The outcome of the Scheme assessment concludes that the Scheme would not result in a significant impact on, nor affect the UK's ability to comply with, the Air Quality Directive (see paragraphs 6.15.4 to 6.15.7 of the ES) (Application Document Reference 6-1, APP-146). As such, it will not "delay compliance".

3. *HEALTH IMPACT ASSESSMENT*

3.1 *We raised concerns about assessment of active travel contained within the Health Impact Assessment (HIA) and Environmental Statement and explained how there was no justification for a minor positive score during operation.*

Highways England Comment

3.1.1 Active travel is one of nine health determinants used in the Health Impact Assessment ("HIA") for the Scheme (REP3-012). Table 17 of the HIA identifies the potential pathways and health outcomes during the construction and operation of the Scheme that may arise in relation to active travel. Issues identified during construction include increased disruption, altered traffic movements and perception that routes have become unsafe which may lead to a possible reduction in levels of active travel and risks associated with sedentary lifestyles. During the operation of the Scheme, Table 17 notes the potential for transport schemes to enhance walking and cycling opportunities, thus increasing the rate of physical activity and associated wellbeing.

- 3.1.2 Table 22 of the HIA identifies a moderate negative impact of the Scheme during construction and a minor positive impact during operation. The minor positive impact has been based on professional judgement and is justified by the fact that all pedestrian and cycle routes affected during construction of the Scheme will be reinstated, with some improvements identified at a number of locations along the route of the Scheme. For example, in relation to Old Slade Lane Overbridge, Highways England supports the dedication of a bridleway and has stated in the Statement of Common Ground between Highways England and Buckinghamshire County Council that it will "continue to work...to establish the standards required to enable Old Slade Lane Overbridge to be made suitable for vehicles/pedestrians/horseriders, within the Scheme design and Order limits". The minor positive impact therefore relates to a Scheme-wide assessment.
- 3.2 *While the scheme was not looking to remove or sever access for pedestrians and cyclists, except during construction, it did not appear to have considered the negative impact from extra traffic that would be generated on the surrounding road network and which would be a disincentive for people to walk or cycle. In addition, no assessment has been made of the impact of lengthening subways under the motorway, which are likely to make them more threatening and off-putting, particularly for pedestrians.*
- 3.3 *Construction in these areas could be an opportunity to improve existing crossing points through a range of measures, such as widening of underpasses, better lighting and flared entrances and exits. Opportunity could also be taken to provide dedicated cycle access at all crossing points both over and underground.*

Highways England Comment

- 3.3.1 Volume 11, Section 3, Part 8 of the Design Manual for Roads and Bridges covers Pedestrians and other Community Effects. Chapter 3 (Predicting changes in journey length) provides some guidance on severance issues. Figure 1 (mean pedestrian delays associated with different road crossing situations) illustrates the relationship between changes in traffic volumes and the effect on mean pedestrian delays. Paragraph 3.5 provides guidance on the assessment approach for which the baseline thresholds for identifying areas for assessment with increased traffic flows as a result of a scheme include "existing roads with traffic flows 30% or more higher." Similarly, chapter 7 of the DMRB guidance covers Relief from Existing Severance in which Table 1 provides the figure of c.30% reduction in existing traffic levels as being the threshold for slight relief in built up areas. Based on the foregoing guidance, changes in traffic flows of a minimum of 30% would be the appropriate level at which severance effects would be felt and, as no changes in flow of this magnitude as a result of the Scheme have been identified, no further assessment is considered necessary.
- 3.3.2 In response to the query as to whether the lengthening of subways under the motorway would have an impact, the subways in question are identified in the Engineering and Design Report (Application Document Reference 7-3, APP-096) as (from west to east) Langley Interchange Subway and Sipson Road Subway. The Langley Interchange Subway requires symmetric widening by 3.2m at each end; the Sipson Road Subway requires extending by approximately 5m in total. As existing pedestrian routes, both subways would, on completion be required to be maintained to an appropriate standard and would be well lit in accordance with relevant design standards. The Sipson Road Subway in particular is well surveyed by residential and commercial premises at either end, providing some form of existing surveillance.

Whilst it is acknowledged that subways are not a preferred type of crossing method, in both locations there is no alternative route (for example a footbridge).

- 3.3.3 Chapter 6 of the DMRB guidance on Pedestrians and Other Community Effects covers the issue of New Severance, for which paragraph 6.1 states that new severance should be considered in terms of a three point scale – slight, moderate or severe. A slight impact would occur in the situation where the current journey pattern is likely to be maintained but there will probably be some hindrance to movement and journeys are increased by up to 250m in length. Accordingly, it is considered that on a worst-case assumption, the impact of extending subways in length would be slight.
- 3.3.4 In response to the final point regarding widening of the subways and significant upgrades of pedestrian crossings, the Scheme is a nationally significant project that is urgently required to address the congestion on one of the UK's main strategic routes. As part of the delivery of the Scheme, Highways England is required to mitigate the impacts of the Scheme. Further, paragraph 3.2 of the National Networks NPS states that the schemes should be "designed to minimise social and environmental impacts and improve quality of life." Highways England explained in its response to Deadline IV how the design of the Scheme meets this objective. However, it should be remembered that this is a publically funded Scheme and therefore a distinction needs to be made between what is necessary to deliver as part of the Scheme and what is 'nice to have'. What is being requested by CBT here are 'nice to haves'.
- 3.4 *We raised the issue about funding streams in the Roads Investment Strategy which are specifically allocated to address historic environmental and community severance issues⁸. The M4 upgrade presents a cost effective opportunity to review whether there are any historical severance or environmental issues and to address any that are found.*
- 3.5 *It is worth noting that National Networks National Policy Statement (NNNPS) has a number of clear and strong statements about reducing severance and addressing the needs of cyclists and pedestrians. Paragraph 3.17 states: "There is a direct role for the national road network to play in helping pedestrians and cyclists. The Government expects applicants to use reasonable endeavours to address the needs of cyclists and pedestrians in the design of new schemes..." it goes on to say that it expects applicants to correct "...historic problems, **retrofitting the latest solutions**..." [our emphasis].*
- 3.6 *Paragraph 3.22 of the NNNPS reinforces this sentiment stating: "...Where appropriate applicants should seek to deliver improvements that reduce community severance and improve accessibility."*
- 3.7 *Paragraph 4.31 of the NNNPS also highlights the need that applicants "...should also mitigate any **existing** adverse impacts wherever possible, for example, in relation to safety or the environment..." [our emphasis].*

Highways England Comment

- 3.7.1 No historical severance issues in connection with the section of the M4 affected by the Scheme have been identified.

⁸ Part 1, pages 9, 15, 53, 56 & 59, Part 2, Page 59, Part 3, pages 6, 9, 10, 25 & 26, [Road Investment Strategy 2015 – 2020](#), March 2015

- 3.7.2 Paragraph 13.3.7 of the ES (Application Document Reference 6-1, APP-153) notes that, whilst there are approximately 113 structures within the scope of the Scheme (including all overbridges, underbridges, pedestrian only underpasses, subways and culverts which carry vehicular and/or non-motorised users across the M4), the main effects for NMUs concern the closure of four bridges for online replacement (namely Marsh Lane, Oldway Lane, Recreation Ground and Old Slade Lane). Paragraph 13.4.2 of the ES (Application Document Reference 6-1, APP-153) identifies that there will be some temporary severance during construction of the Scheme at these locations in particular. However, this severance will be of short-term duration and there will be no permanent severance as a result of the Scheme. Mitigation measures to address the needs of cyclists and pedestrians at these locations are outlined in paragraphs 13.6.4 to 13.6.6 of the ES (Application Document Reference 6-1, APP-153) (and include measures to be undertaken through the CEMP and appropriate bridge closures and diversion routes).
- 3.7.3 The proposed new bridge at Wood Lane includes a 2.0m wide cycle way/foot way along the western side of Wood Lane to accommodate Bridleway Slough 17. The proposed bridge parapets are 1.8m high to provide safe containment of pedestrians, cyclists and equestrian users. Details of the proposed bridge are included in the Bridge General Arrangement Drawings in Annex F2 of the Engineering and Design Report (Application Document Reference 7-4, APP-119).
- 3.7.4 The proposed new bridge at Datchet Road includes a 3.0m wide foot way along the western side of Datchet Road. The proposed bridge parapets are 1.4m high to provide safe containment of pedestrians and cyclists. Details of the proposed bridge are included in the Bridge General Arrangement Drawings in Annex F2 of the Engineering and Design Report (Application Document Reference 7-4, APP-119).
- 3.7.5 Enhanced parapet provision is also included at Monkey Island Lane (1.4m high), Oldway Lane (1.8m high), Recreation Ground (1.4m high) and Old Slade Lane (1.8m high) to accommodate cycle or equestrian usage.
- 3.7.6 With regard to mitigating any existing adverse impacts in relation to safety, the Scheme looked to mitigate these impacts wherever possible. The main existing adverse impact is congestion, which the Scheme is seeking to mitigate through the addition of additional capacity. An adverse impact regarding road user safety at a particular location is on the M4 J5 to 4b eastbound link where there is a high accident rate. The original design option for junction 5 to junction 4b eastbound was for four lanes with a fifth lane for the final 500m before the exit to the M25 (auxiliary lane drop) and three lanes continuing towards London. A fifth lane has been introduced, on the eastbound carriageway, directly east of Sutton Lane Bridge providing two exit lanes dedicated to the M25, to reduce the potential for queuing traffic to tail back on the M4 mainline, therefore reducing risk to road users.
- 3.7.7 Furthermore, the permanent conversion of the hard shoulder through the Scheme maximises the use of the space available and removes the risks introduced associated with stopping on a hard shoulder which is an existing adverse impact (hazard). As outlined with the hearings and submission for deadline IV (Examination Reference REP4-002), on dual 3-lane motorways, discretionary illegal stops (comfort stops and vehicle checks on the hard shoulder, i.e. illegal stops) outnumber breakdowns by between 8 and 10 times (ref: Evaluating the Frequency of Emergency Refuge Areas (ERAs) (Examination Reference REP4-002 – Appendix C)). Discretionary (illegal stops) will be significantly reduced as road users are more likely to only stop in an emergency. Therefore the Scheme improves safety for road users.

- 3.7.8 An existing adverse hazard is the stopping of vehicles in live lanes which can occur currently on the M4. Although it is recognised that the risk of live lane stoppages increases through the implementation of All Lane Running (ALR), Highways England have control measures in place to mitigate against this risk e.g. Emergency Refuge Areas located throughout the scheme at regular intervals and implementation of a controlled environment through lane closures, Variable Mandatory Speed Limits and Closed Circuit Television (CCTV). Also on the unfortunate occasions when incidents do occur the use of the full CCTV coverage is available to manage efficient responses to incidents and any requirement for an area to be protected through the setting of signs and signals. Consequently most of the current motorway (adverse impact) risks are expected to reduce as a result of the implementation of all lane running (see paragraph 10.3.6 of the Engineering and Design Report – Examination Reference APP-096) more than compensating for an increase in the risk of a vehicle stopping in a live lane.
- 3.7.9 The measures proposed to mitigate any adverse impacts on the environment are documented in the Environmental Statement and are listed in the Table of Mitigation (APP-027).
- 3.8 *At a minimum, Highways England should also be looking to provide cycle lanes and safe pedestrian routes on any new bridges it is constructing for busier roads so that these do not present a barrier for future provision. The cost of doing this at construction is much lower than trying to retrofit any such facilities.*
- 3.9 *It should also be assessing the suitability of existing provision and determining whether it is fit for purpose. Some of the bridges and underpasses could be vastly improved to provide simpler and more pleasant crossing points for vulnerable road users.*
- 3.10 *Unfortunately, Highways England was unable to justify a positive score for active travel as it has done little or nothing to fulfil the requirements of the NNNPS on this issue.*

Highways England Comment

- 3.10.1 Highways England is including provisions within the M4 smart motorway Scheme to make a positive contribution to active travel. For example the replacement of existing overbridges, as listed below include for enhanced parapet provision to accommodate cycle or equestrian usages:
- Monkey Island Lane (1.4m high) – Part of national cycle network
 - Oldway Lane (1.8m high) – Accommodates cycle route and a bridleway
 - Wood Lane (1.8m high) - Accommodates a bridleway
 - Datchet Road (1.4m high) – Accommodates a cycle route
 - Recreation Ground (1.4m high) – Accommodates a national cycle route
 - Old Slade Lane (1.8m high) – Accommodates a bridleway
- 3.10.2 This comment is also addressed in response to paragraph 3.1 above, regarding a score of minor positive in relation to active travel.

3.11 *Highways England committed to look at whether there was an opportunity for enhancements for pedestrian and cycle links over and under the M4, but this needs to be informed by the requirements of the NNNPS and through a proper appraisal of the issues.*

Highways England Comment

3.11.1 As part of the M4 smart motorway Scheme eleven existing overbridges are being replaced. The bridge replacements at Monkey Island Lane, Datchet Road, Recreation Ground will have 1.4m height parapets, and are enhanced compared to the existing 1m high parapets, due to cycle usage on those routes.

3.12 *Taking a broader look at the HIA and it is clear that much of the scoring within it is overly optimistic and without evidence to support the position taken. Looking at each of the nine areas that the HIA looked at in turn, we find the following:*

- *Access to social infrastructure – minor positive. We would suggest that this is more likely to be neutral overall as while it may allow more people to drive, it is likely to lead to greater congestion on the surrounding road network. Apart from the problems to drivers that this will cause it will impact on walking, cycling and potentially buses as well. Given that vulnerable people and those on lower incomes are less likely to drive and be reliant on other forms of transport, this will have a negative impact on them accessing their social infrastructure. There could also be wider impacts due to the increased air pollution and loss of green space and community assets, which could even tip the overall impact to a minor negative one.*
- *Recreational, green space and light pollution – minor negative – agree with this score.*
- *Active travel – minor positive. As explained above, we cannot see how just retaining what is there already can be described as a positive benefit during operation. Given the extra traffic on the surrounding roads (which pedestrians and cyclists need to use) and the lengthening of subways, which will make them less attractive and feeling less safe, the overall impact of the scheme on active travel will be minor negative at least.*
- *Air quality – minor negative. As explained in this document and in our other submissions, air pollution arising from this scheme is likely to be significant. Unfortunately the modelling and assumptions made by Highways England, which they have not been able to justify, paint an overly optimistic view of future impacts, not least their modelling on how air pollution will fall away over time. If this was properly assessed this would be scored as a major negative impact.*
- *Noise and vibration – minor positive. We agree with this if the extra noise from the increase in traffic is more than compensated by the low noise surface in a deteriorated condition and with new and better noise barriers being installed.*
- *Soil and water pollution – neutral – accept.*
- *Community safety and stress – moderately positive. We disagree with this for a number of reasons, not least because of the negative impact that this scheme will have on pedestrian and cycle safety on the surrounding road network and when using underpasses, etc. Increasing air pollution will also impact on human health causing greater harm and stress. However, most importantly, this category has been wrongly assessed from a driver's perspective. Driver stress has been given a very positive score because the HIA has used the large reductions in crashes seen on the M42 pilot as a guide to what will be*

seen on the M4⁹, yet in the graph of comparison of risk for different motorway configurations¹⁰, the M42 is shown as having significantly less risk than that proposed for the M4, where only an 8% point improvement in risk is expected. A similar mistake is made in the Executive Summary of the HIA which quotes an 18% reduction in risk, failing to point out that the safety baseline is not the position of the current M4. Therefore the overall score for this category, is more likely to be between minor positive to neutral.

- Access to work and training – moderately positive. If you can drive and own a car, this may be true but this will not help those who rely on other modes of transport and who could well be disadvantaged by this scheme.
- Minimising the use of resources – this was scoped out and not scored for operational impacts. However, minimising the use of resources would focus on reducing car use where resources are only used for a short period every day while prioritising low impact and resource efficient means such as walking, cycling and public transport. The latter makes far better use of resources as buses are in operation most of the day, not parked in car parks taking up large amounts of space. Therefore, if scored for its impact during operation, this would potentially come out negative.

Highways England Comment

3.12.1 Highways England notes again that CBT offers no evidence or data to contradict the Applicant's scoring mechanisms or to support the allegation of being overly optimistic. The scoring mechanism used within the HIA has followed a methodical approach as set out in Table 22 of the document (REP3-012). For each level of significance, the table clearly defines the type of health effect that may be likely to occur (from death/acute or chronic disease through to changes to quality of life/enhancement to wellbeing), the geographical distribution of the health effect, the number of people that may be affected/possible impact on vulnerable groups, and the duration and permanent/temporary nature of the health effect. The scoring is clearly informed by the findings of the ES (Application Document Reference 6-1) and associated documents such as the Socio-Economic Report (Application Document Reference 7-2, APP-090) and the Engineering and Design Report (Application Document Reference 7-3, APP-096), within which technical assessments relating to various topics have been made.

3.12.2 Considering each of the topics as listed above:

- Access to social infrastructure – as stated in response to 3.2 above, the findings of detailed assessment work have shown that there is unlikely to be an impact on the operation of the surrounding road network as a result of displaced traffic arising from the Scheme construction. Wider impacts relating to loss of green space relate primarily to the construction phase (where the HIA records an assessment of moderate negative for this criterion). Table 22 of the HIA (REP3-012) notes that any loss of green space during Scheme operation (as a result of permanent land-take) is very minor. The scoring in the HIA relates to the operation of the Scheme overall, based on the overall improvements to the road network relied upon by local

⁹ See first paragraph, under Operation, page 96, [Health Impact Assessment](#) – "The M42 is seen as an appropriate comparator for the Scheme."

¹⁰ Figure 3.1, [Campaign for Better Transport, First written representation](#), October 2015

business and residents. As such, it is considered that the minor positive scoring is accurate.

- Recreation, green space and light pollution – scoring agreed.
- Active travel – refer to the response to 3.1 above.
- Air quality – 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 of the Scheme are not significant. The air quality assessment for the Scheme is provided in Chapter 6 of the ES (Application Document Reference 6-1, APP-146). Increases in traffic along the motorway network, such as the Scheme route, have been assessed. The overall operational assessment of significance of the Scheme is set out in paragraph 6.15.16 and Tables 6.21 and 6.22 of the ES (Application Document Reference 6-1, APP-146). As such, it is considered that the minor negative scoring is accurate.
- Noise and vibration – scoring agreed.
- Soil and water pollution – scoring agreed.
- Community safety and stress – the moderate positive impact relates only to the operational phase of the Scheme. The Scheme will have no negative impact on the safety of pedestrians and cyclists on the surrounding road network during the operational phase. The findings relating to air pollution are referred to above. The remainder of the comments relate to the assessment of driver stress. Table 22 of the HIA (REP3-012) refers to the likely reduction in accident numbers predicted to take place as a result of the Scheme, reduction of general congestion and improvements in journey time reliability, each of which are considered to be able to reduce driver stress and contribute to the moderate positive scoring.
- Access to work and training – the HIA has assessed the health outcomes of a road scheme and by its nature, the assessment of access to work and training has focused on the benefits to those with access to a car in the first instance.
- Minimising the use of resources – the HIA has made use of assessment criteria taken from the NHS London Healthy Urban Development Unit ("HUDU") matrix. In relation to minimising the use of resources, the HUDU Matrix identifies appropriate criteria as being:
 - Does the proposal make best use of existing land?
 - Does the proposal encourage recycling (including building materials)?
 - Does the proposal incorporate sustainable design and construction techniques?

These questions were considered to be of relevance only to the construction element of the Scheme. An additional assessment criteria, "does the proposal encourage sustainable waste management with consideration for human health?" was also added for completeness. It is considered that these

questions adequately cover, for the purposes of an HIA, the criteria of minimising the use of resources.

- 3.13 *From the above analysis, it is clear that if these nine categories were properly re-evaluated, the HIA is likely to come out with at least a minor negative outcome overall. That is based on taking the most optimistic score in the reassessments carried out above, so a more pessimistic view would see the negative impact worsen.*

Highways England Comment

3.13.1 The response to 3.12 above sets out the response of Highways England in relation to each of the assessment criteria used, and it is considered that the conclusions of the HIA in relation to each criteria should stand.

4. CARBON EMISSIONS

- 4.1 *Campaign for Better Transport supports the point that Friends of the Earth raised regarding the policy gap that has been identified as opening up on reducing carbon emissions overall and the slight increase seen from transport recently. This concern is increased by the fact that research shows that real life carbon emissions from new cars can be substantially above those advertised by manufacturers, in some cases over 50% higher than claimed¹¹.*

Highways England Comment

4.1.1 Highways England has passed a copy of CBT submission to the Department for Transport, as the competent authority for carbon vehicle emission factors, to provide a response to this question.

5. *NOISEThe figures presented at the Examination by Highways England show that new low noise surfaces provide a noise benefit of 4-6 dB over a hot rolled asphalt surface, but after 10 years this drops to 1-3 dB. However, we are not convinced that a 3.5dB benefit ascribed to a low noise surface over its lifetime is appropriate, given that the average benefit after 10 years is only 2dB and at that point the surface could be around for a further 5 years before it is renewed.*

Highways England Comment

5.0.1 All road surface types degrade over time, with consequent increases in tyre/road noise. However, like any surfacing, low noise surfacing is replaced periodically with the life expectancy determined by the specific constituents, quality of construction and amount of traffic and environmental conditions. The typical life expectancy is between 10 and 15 years (ref paragraph 6.20 of DMRB Volume 7, Section 5, Part 2 (HD37/99 Amendment No. 1)). The surfacing will be regularly monitored following installation using a variety of tests (e.g. skid resistance) and will be maintained to a high standard and then replacement scheduled once its performance is no longer satisfactory, in accordance with Highways England's standard procedures and the requirement under its Strategic Highways Licence.

¹¹ Transport & Environment Report: [Mind the Gap 2015: Closing the chasm between test and real-world CO2 emissions](#), September 2015

5.0.2 The -3.5 dB correction for the low noise surface is a requirement of applying the Design Manual for Roads and Bridges ("DMRB") process (DMRB, Volume 11, Section 3, Part 7, paragraph A4.29).

5.1 *In addition, quite a lot of the M4 already has a low noise surface so the benefit of a new low noise surface would not be as great as for a road not already treated.*

Highways England Comment

5.1.1 The existing surfacing on the M4 has been accounted for in the noise assessment for the Scheme. Paragraphs 12.2.53 and 12.2.54 of the ES (Application Document Reference 6-1, APP-152) define the road surface assumptions employed in the noise modelling work for the Do Minimum (i.e. without the Scheme) and Do Something (i.e. with the Scheme) scenarios.

6. TRAFFIC SAFETY

Improving safety

6.1 *At the Issue Specific Hearing, Highways England said it was their policy to not make safety worse with the scheme and when we raised the issue of their aim of reducing injuries and deaths to as close to zero by 2040, with an interim target of a 40% reduction by 2030¹², we were informed that this was just an aspiration.*

Highways England Comment

6.1.1 As outlined within the submission at Deadline IV (Examination Reference REP4-002), Highways England confirmed, in response to a press release highlighted by the Campaign for Better Transport that it does aim for no one to be harmed on the strategic road network. However, this is an aspirational aim to be achieved by 2040 rather than an immediate, binding policy stipulation. The article is entitled 'No one should be harmed when travelling or working on our highways' and is at the following reference: <https://www.gov.uk/government/news/no-one-should-be-harmed-when-travelling-or-working-on-our-highways>. It states "By taking a holistic approach to health and safety, Highways England aims for no one harmed when travelling or working on our road network."

6.1.2 As a capacity scheme, the Scheme is required to maintain, not necessarily improve safety standards. Highways England Policy has stated that 'by the end of 2020 we aim for a 40% reduction in the number of people killed or seriously injured on our roads. By 2040 we want to get this number as close to zero as possible'. The Scheme will contribute to this target, it will deliver a scheme which does not compromise safety and is expected to deliver an improvement.

6.2 *However, the NNNPS goes somewhat further than the position Highways England gave, stating in paragraph 3.10 "...scheme promoters are expected to take opportunities to improve road safety, including introducing the most modern and effective safety measures where proportionate." While this contains a caveat around introducing the latest technology, it is clear that schemes should deliver safer roads, not just maintain the status quo.*

¹² Section 3.3, [Comments on Highways England's responses to Panel's 1st Written Questions](#) – 5 Nov 2015

Highways England Comment

- 6.2.1 Overall the Scheme will improve road safety when compared to a Do Nothing scenario. As explained with the safety hearing, section 5.2.78 of the Planning Statement (Examination Reference APP089) explains that the calculations from the hazard analysis work show that the total score given in relation to the period after construction of the Scheme represents a reduction of risk of approximately 18% in comparison to the safety baseline (with no MIDAS queue protection). Even when the additional safety benefit of 10% above the baseline with MIDAS is taken into account, the Scheme would still expect to see a reduction in risk of approximately 8% and hence meet the required safety objective.
- 6.2.2 As explained during the hearing and in the submission at Deadline IV Examination Reference REP4-002), as a congestion management scheme, the Scheme is required to maintain, not necessarily improve safety standards. This is consistent with the National Policy Statement for National Networks (NN NPS – section 4.60) which says that some developments may have safety as a key objective, but even where safety is not the main driver of a development the opportunity should be taken to improve safety, including introducing the most modern and effective safety measures where proportionate. The requirement for smart motorways is to confirm that safety will be made 'no worse' than the baseline by the introduction of the Scheme as referenced in the ALR generic safety report (<http://assets.highways.gov.uk/specialist-information/knowledge-compendium/2011-13-knowledge-programme/MM-ALR%20generic%20safety%20report%20final.pdf>), section 4.1.2 Road user safety objective. Despite the Scheme being aimed primarily at relieving congestion, rather than improving safety, there are predicted improvements in safety as a result of the Scheme.
- 6.2.3 The NN NPS at section 2.23 states that the Government's wider policy is to bring forward improvements and enhancements to the existing Strategic Road Network. Enhancements to the existing national road network will include implementing "smart motorways to increase capacity and improve performance". The NN NPS also explicitly acknowledges the implementation of ALR schemes in FN29, which notes that the hard shoulder is transformed into a permanent additional running lane.
- 6.3 *Furthermore paragraph 4.60 states that: "New highways developments provide an opportunity to make significant safety improvements..." It goes on to repeat some of the wording in paragraph 3.10. Paragraphs 4.64 – 4.66 then talk of the need to "minimise the risk of death and injury" and that consent should not be granted unless "...all reasonable steps have been taken and will be taken to minimise the risk of road casualties arising from the scheme..."*
- 6.4 *This would tend to suggest that a more robust justification should be provided as to why the M42 SMART motorway configuration was not considered as an option for the M4, given its far lower risk, as this would have led to a minimisation of road casualties as demanded by the NNNPS.*

Highways England Comment

- 6.4.1 As explained above in paragraph 6.2.1, there are safety improvements as a result of the Scheme.
- 6.4.2 However, as explained within the safety hearing it is acknowledged that the original Smart Motorway design (the M42 Pilot – an Hard Shoulder Running ("**HSR**")

scheme) provides an alternative proposal which would provide a greater reduction in risk (i.e. a greater level of safety) compared to the Scheme. There are a number of reasons which provide a robust justification to explain why the ALR concept has been selected for the proposed scheme and not an HSR scheme which may provide greater safety benefits:

- 6.4.2.1 Highways England's experience of operating HSR has shown that it is resource intensive. Operators are required to open and close the hard shoulder during every peak period.
- 6.4.2.2 It also has been found to have a number of potential technology points of failure, which means that the hard shoulder cannot be opened to traffic on occasion. For example, the opening of the hard shoulder as a running lane on an HSR scheme for safety reasons requires all hard shoulder lane signals to be available. When a hard shoulder lane signal develops a critical technology fault then the operator cannot open the hard shoulder to traffic. In addition, as there is a requirement for the operator to be able to view the full length of hard shoulder prior to opening, should a hard shoulder camera develop a fault where the operator cannot view a section of hard shoulder (either through a hard shoulder camera or a Pan- Tilt-Zoom camera) then the operator will not open the hard shoulder to traffic.
- 6.4.2.3 Furthermore, the level of potential technological failure results in a high maintenance burden which itself results in Highways England's maintenance workforce being exposed to greater risk. ALR reduces the risk of technology failure (where there would be impact on the provision of additional capacity and therefore subsequent impact on journey times) and risk to the workforce.
- 6.4.2.4 ALR also provides greater journey time benefits and provides a more consistent driving environment helping to reduce driver uncertainty and driver stress (as lane one is always available to traffic (unless there is an incident) there is no confusion with regard to which lanes are open and closed).
- 6.4.2.5 Another benefit is that ALR schemes remove the risk of hard shoulder misuse which can occur on HSR schemes when the hard shoulder is closed
- 6.4.3 All of these factors impact on the financial and operational benefits of smart motorways. Highways England design and operate the network in a safe way. In issuing the Smart Motorways design guidance (IAN 161/13), Highways England utilised its operational and design experience of smart motorways since the M42 Pilot was designed and commenced operation in 2006 and has undertaken considerable research to provide a fully evidenced approach to the decisions taken in updating designs. Paragraph 5.1.18 of the EDR states that The Roads Programme Steering Group ("RPSG") determined that the Scheme should be based on the operational principles of Managed Motorways all-lane running ("MM-ALR"), as set-out within Interim Advice Note ("IAN") 161/13.
- 6.4.4 In addition, all of the work and the proposed design is supported by a hazard log assessment which is publicly available. This hazard log, as stated in paragraph 10.3.3 of the EDR "...is a database that contains a list of operational hazards, the associated risk from each hazard, and mitigations to reduce the risk to an acceptable level. The

Agency's generic hazard log contains 135 hazards that specifically relate to smart motorways. Each hazard is assessed to understand how often it occurs, how likely it will be to lead to an accident, how severe a typical accident is likely to be and how the risk can be managed"

Mitigation / Options

6.5 *There was some discussion of reducing traffic speeds in relation to both air quality and noise. We would like to point out that whatever the reservations of Highways England, a permanent speed reduction would have numerous benefits and few downsides:*

- *Air pollution would reduce with a 50 or 60mph speed limit*
- *Noise – this decreases with speed*
- *Safety – lower speeds would reduce the number and severity of crashes which would contribute to reduced driver stress*
- *Carbon emissions would reduce with a 50 or 60 mph speed limit*
- *Smoother and more effective traffic flow - it is possible to accommodate a greater flow at speeds of 50-60 mph, compared with 40 or 70 mph*
- *Could avoid the need for as much air and noise mitigation which would help reduce the potential visual impact and associated costs*

Highways England Comment

- 6.5.1 The outcome of the air quality assessment demonstrates that the Scheme is not likely to have a significant air quality impact, nor is it likely to affect the UK's reported ability to comply with the air quality directive. Consequently, this would not trigger the need for additional mitigation, such as the speed reductions referred to by CBT.
- 6.5.2 However, Highways England has set out in its Delivery Plan and Strategic Business Plan a commitment to support improvements to the environment, including air quality, where it can.
- 6.5.3 Highways England is looking to achieve improved air quality across the Strategic Road Network, and is exploring options and opportunities to do this, and recognises the importance of other key partners, such as local authorities in delivering any intervention. The M4 in common with other sections of our road network will be included in this work.
- 6.5.4 Reducing speed limits on the motorway, could in some circumstances help to provide reductions in noise, air quality, carbon and fuel usage. This would either be through reductions in flow along the motorway or more optimal driving conditions. The Scheme will use speed control to manage the traffic flows as part of its operation.
- 6.5.5 However, where a blanket speed control is applied there is potential for wider scale changes in traffic movements which could lead to increases in noise, air quality, carbon and fuel usage, through longer journeys and / or more traffic traveling on local roads passing more residential properties and so on.
- 6.5.6 With regard to the safety impact of a permanent speed reduction, the response in the hearing to the examiners' question number 3 explained the implications with regard to

the introduction of a mandatory reduced speed limit (e.g. 50 or 60 mph) during off peak periods. The introduction of a non-safety related speed limit would have a negative implication in regard to driver frustration as a result of an increase in journey times, particularly during off peak periods. A significant disadvantage of reducing the speeds off peak is that journey times during the off peak would be significantly affected by a reduced speed limit and this would also have a negative impact on the business case for the Scheme.

- 6.5.7 Therefore, achieving a greater safety scheme benefit would require a high level of compliance during the off peak periods and therefore it is important that drivers do not become frustrated with driving at a reduced speed limit. A reduced speed limit during the off peak may have a significant impact on the level of frustration as drivers would experience higher journey times. This driver frustration may also have corollary effects on safety and compliance issues.
- 6.5.8 The safety benefit of introducing a reduced speed limit may result in a slightly greater reduction in risk, but this would depend on the effect on level of compliance achieved on the Scheme. Should non-compliance be an issue then it will impact on this Scheme and potentially across the network offsetting any potential reduction in risk.
- 6.5.9 It is noted that even without introducing a permanently reduced speed limit, the Scheme meets and betters its safety objective, namely that of making the safety of the M4 "no worse".

6.6 *In contrast, the only negative impact would be a reduction in vehicle speeds and the scheme's cost benefit ratio, but the most likely impact would be at off-peak times when traffic management measures are less likely to be used. Therefore the impact on the overall value for money should not be that great and some elements such as improved safety would contribute to reducing costs.*

Highways England Comment

- 6.6.1 Should a permanent speed reduction be imposed it is agreed that the greatest impact on vehicle speeds would generally be during the off peak periods as during peak hours speeds will be restricted due to the level of congestion on the road. A significant disadvantage of reducing the speeds off peak is that journey times during the off peak would be significantly affected by a reduced speed limit and this would also have a negative impact on the business case for the Scheme. A total of £536.5M in journey time benefits are provided by the Scheme (as detailed in appendix B of the Socio-Economic Report, Examination reference APP-090). Any application of speed limits when they are not required by traffic conditions will erode these benefits. As noted above in para 6.5.8, the safety benefit of introducing a reduced speed limit may result in a slightly greater reduction in risk, but this would depend on the effect on level of compliance achieved on the Scheme. Therefore, it is not correct to say that an improved level of safety would contribute to reducing costs in this particular scenario where a permanently reduced speed limit is imposed during the off peak periods.
- 6.7 *There was also an issue raised about using average speed cameras and that these had not been used or approved in a managed motorway setting. However, there is nothing to stop the gantry speed cameras being deployed for spot speed checks when traffic speeds are reduced for traffic management reasons, alongside average speed cameras used solely to enforce the maximum speed allowed on the motorway. In fact the presence of the average speed cameras could have the beneficial impact of encouraging drivers to drive at constant speeds between gantries and not speed up and slow down as currently happens.*

Highways England Comment

- 6.7.1 As explained during the hearing and in the Submission at Deadline IV ((Examination Reference REP4-002 section 3.8), Highways England has confirmed, in response to comments made by the Campaign for Better Transport, that there are no long distance average speed enforcement systems currently approved by the Home Office for use with a variable speed limit scheme that could be introduced. The current approach therefore relies on a "spot" speed approach to achieve compliance where variable speed limits are in place.
- 6.7.2 Drivers who commit an offence during Traffic Management are subject to prosecution should they exceed the speed limit on display. An appropriate enforcement regime will be in place when Traffic Management works are being undertaken. There is currently no Home Office approval for the use of two different types of enforcement systems within one scheme. Average speed cameras would only need to be considered for long term Traffic Management works.
- 6.7.3 Also, the construction of the M4 J3-12 scheme presents opportunities to undertake maintenance renewal activities resulting in an overall cost saving and minimising disruption to the customer. The residual life of all existing assets retained in a scheme at the opening year should be no less than 5 years to avoid significant customer disruption too soon after completion.