

Adran yr Economi a'r Seilwaith  
Department for Economy and Infrastructure



**File Ref WG/REB/OBJ0144.2 – CPRW/Warren**

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Llywodraeth Cymru  
Welsh Government

**Objection Ref OBJ0144**

**Response to Objector's Evidence: Victor Warren (CPRW)**

## **1. GROUNDS FOR OBJECTION**

### **1.1. Details**

1.1.1. Victor Warren has submitted a Statement of Evidence dated 6 February 2017 in relation to the draft statutory Orders associated with the Welsh Government's proposals for the M4 Corridor around Newport, which has been received via the Programme Officer.

1.1.2. The Welsh Government understands the evidence submitted within Victor Warren's Statement to be based on the following:

1. Stated that taking all these contributory factors into account the cumulative effect on the landscape of the route, CPRW believes its impact will be even more significant and more unacceptable than suggested by the Welsh Government's Environmental Statement and result in a permanent and unacceptable change to the character of this landscape when viewed from the North.
2. Stated that it is manifestly obvious that the choice of route and consultation has been at least inadequate.
3. Stated that highway network resilience may be the only real justification for a new M4; blockage of the Brynglas tunnels is a serious, but rare, problem. However, Prof. Cole's Blue Route would provide that resilience at a third of the cost, and also add great benefits in better access to Newport docks and industry.
4. Stated that road policy in England from 2015 is to improve existing main roads, and not to build new motorways.
5. Stated that it is very evident that there are similar needs for road improvements all over Wales, not least in NE Wales, and to improve north-south links. Spending £1bn on the M4 in SE Wales will preclude other spending for years.
6. Stated that if the Metro will have no major effect on M4 traffic, why is the Welsh Government planning to spend £billions on it? We are advised that a proper mixed and integrated system on the Frieberg [sic] model will do that and more.

7. Stated that should the Inspector agree with our conclusions, we respectfully request that significantly greater weight is ascribed to the importance of the landscapes of the Gwent Levels and its surroundings and hence the consequences of this scheme on their values and benefits, when he judges the overall significance of the scheme's environmental impacts against its unconvincing merits.
8. Stated that traffic flows throughout the UK are seen to be stabilising, and it is generally accepted that DfT National Road Traffic Forecasts have not been realised over recent years. It appears that car travel is in fact reducing, although light goods traffic is increasing.
9. Stated that that commuting by car is not popular, and the proposed South Wales Metro, assuming it will produce a much improved mass transit system, will take commuting traffic off the M4, relieving the motorway at current peaks and more generally.
10. Stated that the necessity of more careful traffic modelling is widely under discussion. A paper in Institution of Civil Engineers Proceedings this month ('Strategic analysis of the future of national infrastructure') includes assessing traffic needs, and quotes from the National Needs Assessment.
11. Stated that the Welsh Government has not proved that traffic growth necessitates this huge scheme; and it is not obvious that the effect of autonomous vehicles and other new transport modes and delivery technologies have been considered over its long design life.
12. Stated that Welsh Government was forced to postpone the Public Inquiry to re-assess the traffic model, and that the original traffic forecasts have been reduced. We maintain that there is no reasonable case for the scheme in terms of traffic capacity.
13. Stated that although this length of the M4 is described by WG as 'congested', how this has been determined is far from clear. We have searched for congestion statistics, and found these for English motorways on the DfT website. But the M4 in Wales is not there, being the responsibility of Welsh Government.

14. From before May 2014 (see attached copy email) CPRW repeatedly asked Welsh Government for congestion statistics, to compare the M4 in Wales with other lengths, and other motorways. Last year we were told they had figures, but were not planning to release them. A Freedom of Information application and appeal has failed, and at present the complaint is with the Regulator, who has indicated that it is a case he should investigate.
15. Waiting for justification of the Welsh Government's opinion that congestion is a reason for the new motorway. We believe that congestion on the length of the M4 in question is no worse than many other urban peripheral motorways, and sections of the M4 further west.
16. Have checked on the EuroRAP Risk Rating of Britain's Motorways and A Roads, published by the Road Safety Foundation. This classes the M4 in South-East Wales as one of the 'Low risk (safest) roads'. So again, no justification.
17. Stated that Welsh Government has put forward a business case that is far from convincing. The economic value of spending over £1bn in SE Wales is lacking. Prof Cole's 'Blue Route' proposal puts it succinctly: -  
""The Federation of Small Businesses concludes that there is "a lack of common sense" in the current consultation with the Government committing the vast majority of Wales' future borrowing capacity to a single project. This, it says, is not in the best interest of the wider Welsh economy.
18. Stated that a new motorway is out-of-date policy. To emphasise, this proposal would economically disbenefit areas of Wales outside the South-East.
19. Stated that more locally, Cardiff is already congested in commuting hours, yet this proposal in advance of Metro will add another major traffic flow. Cardiff will gridlock.
20. Stated that Friends of the Earth also highlight major flaws in the flimsy 'business case', including costs not included which would substantially increase the cost of the scheme. This calculation puts the real cost of the scheme to be nearer to £2bn than £1bn, and the benefit / cost ratio to be

close to 1, not 2. These are serious criticisms which would undermine the whole economic basis of the scheme, and must be answered.

21. CPRW fully supported the case made by Gwent Wildlife Trust and Wildlife Trust Wales for the need and the duty to retain the special, unique and protected areas of the Gwent Levels for wildlife and biodiversity, and for the recreation and enjoyment of future generations.
22. Stated that it is a travesty of the Welsh Government's environmental and biodiversity policies that this proposal entirely ignores 'protected' landscapes.
23. CPRW supported the Friends of the Earth case on emissions and the spread of pollution.
24. CPRW supported Campaign for Better Transport's objection, especially the statement 'The proposals also ignore the potential of rail freight and improved public transport to meet transport needs'.

## 2. REBUTTAL

### 2.1. Points Raised

2.1.1. Some of the above points have already been addressed in previous correspondence. Others are dealt with by topic by the relevant witness in the following sections, in addition to their general proofs of evidence, to which readers should also make reference in their entirety for a full understanding of the Welsh Government's case. For ease of reference the places where the above points are addressed in this Rebuttal are listed in the table below:

Objector's point reference	Rebuttal paragraph reference	Objector's point reference	Rebuttal paragraph reference
1	2.1.2	13	2.4.5
2	2.1.2	14	2.2.3
3	2.1.2	15	2.2.3
4	2.2.2	16	2.4.6
5	2.1.2	17	2.1.2
6	2.1.2	18	2.1.2
7	2.1.2	19	2.4.7
8	2.4.1	20	2.1.2
9	2.4.2	21	2.1.2
10	2.4.3	22	2.1.2
11	2.4.4	23	2.3.1
12	2.4.4	24	2.1.2

2.1.2. The Objector's points that have already been covered in previous correspondence and proofs of evidence are as follows:

1. **Point 1** (*Stated that taking all these contributory factors into account the cumulative effect on the landscape of the route, CPRW believes its impact will be even more significant and more unacceptable than suggested by the Welsh Government's Environmental Statement and result in a permanent and unacceptable change to the character of this landscape when viewed from the North*) / The assessment of landscape and visual impacts has followed the appropriate guidance in DMRB, IAN 135/10(W) and GLVIA3. As noted in the Proof of Evidence of Nicholas

Rowson Proof at paragraph 2.5.3, both the scope and outcomes of the assessment are agreed by those statutory bodies that have commented. The landscape assessment presented in Chapter 9 of the Environmental Statement (Document 2.3.2), includes the consideration of all potential impacts on landscape character and landscape quality, including the Gwent Levels and from a range of viewpoints.

2. **Point 2** (*Stated that it is manifestly obvious that the choice of route and consultation has been at least inadequate*) / Proof of Evidence of Matthew Jones WG1.1.1 section 3 explains the background to the Scheme. Engagement on the problems, objectives and possible solutions to the M4 around Newport has been ongoing since the early 1990s. The background to the development of the Scheme including engagement with others is set out in section 3 of WG1.1.1. Significant efforts were made to help people with an interest in the proposals understand the available information and have any queries addressed appropriately. As was recorded in the 2015 Public Information Exhibitions Report<sup>1</sup>, an evaluation survey of attendees showed 90% 'tended to agree' or 'strongly agreed' that the exhibitions helped them to understand the proposals. Furthermore, 92% selected 'YES' on a touchscreen computer which asked "Have you found all the information you wanted today? YES / NO". In addition, a designated Public Liaison Officer aims to help people contact the project team to help address any concerns or queries where possible.
3. **Point 3** (*Stated that highway network resilience may be the only real justification for a new M4; blockage of the Brynglas tunnels is a serious, but rare, problem. However, Prof. Cole's Blue Route would provide that resilience at a third of the cost, and also add great benefits in better access to Newport docks and industry*) / Bryan Whittaker in section 3 of Proof of Evidence WG1.2.1 explains the existing traffic conditions on the M4 around Newport, and outlines network resilience as one of the transport problems on the corridor, also addressing capacity issues. Ben Sibert addresses the current design issues and associated constraints in his evidence (WG1.5.1). An Appraisal of Objectors' Alternative Blue Route Proposals Report (Document 6.2.35) considers the Blue Route

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<sup>1</sup> <http://gov.wales/docs/det/publications/170117-m4-corridor-around-newport-en.zip>

and confirms it would not address the problems or achieve the objectives of the M4 Corridor around Newport. As stated in the Proof of Evidence of Matthew Jones WG1.1.1 paragraph 24.17, the Scheme is considered by Welsh Government to be the long term, sustainable solution to the serious problems experienced on the M4 around Newport. In collaboration with our proposals for a South Wales Metro, it forms a vital part of our vision for an efficient and integrated transport network for Wales. There is a compelling case in the public interest for the Scheme to proceed.

4. **Point 5** (*Stated that it is very evident that there are similar needs for road improvements all over Wales, not least in NE Wales, and to improve north-south links. Spending £1bn on the M4 in SE Wales will preclude other spending for years*) / Proof of Evidence by Matthew Jones WG1.1.1 paragraph 13.5 explains that funding for the delivery of this project has been explicitly identified and provision set aside within the Welsh Government's published capital plans for the next four years. Allocations are not made beyond a 4 year period but suitable forecasts are in place to enable assurance to be given that the full funding requirements associated with the project are available within a reasonable timescale should the decision be taken to proceed. The Project would be funded through a combination of UK Government borrowing and Welsh Government Transport capital budgets. The Welsh Government would not be allocating the full amount of its borrowing capacity to this scheme, important though it is. The balance of the current borrowing limit, over £500m, will be available to fund schemes in other parts of Wales from 2018/19 onwards when Stamp Duty & Landfill Tax are planned to be devolved to Welsh Government.
5. **Point 6** (*Stated that if the Metro will have no major effect on M4 traffic, why is the Welsh Government planning to spend £billions on it? We are advised that a proper mixed and integrated system on the Frieberg [sic] model will do that and more*) / Proof of Evidence by Matthew Jones WG1.1.1 section 9 addresses public transport and the Metro and confirms "In combination with the Scheme, Welsh Government is progressing with a Cardiff Capital Region Metro (Documents 6.1.6, 6.3.4 and 6.3.6). This investment in public transport measures achieves wider

benefits for the region than relieving motorway traffic". Freiburg has an extensive pedestrian zone in the city centre where no vehicles are allowed, which is a very different context to Newport. However, the Welsh Government is taking steps to improve public transport with its Metro alongside the M4 proposals, as outlined above.

6. **Point 7** (*Stated that should the Inspector agree with our conclusions, we respectfully request that significantly greater weight is ascribed to the importance of the landscapes of the Gwent Levels and its surroundings and hence the consequences of this scheme on their values and benefits, when he judges the overall significance of the scheme's environmental impacts against its unconvincing merits*) / Proof of Evidence of Nicholas Rowson WG1.8.1 refers to the ES (Document 2.3.2). The ES LVIA assessed the sensitivity of LCA's 2 and 7 (Wentlooge and Caldicot Levels) to the proposed development as High, ES paragraphs 9.7.8 and 9.7.15 respectively, based on their quality, condition, value and potential to accommodate the change of the type proposed. In following (the accepted DMRB guidance), there is no rationale or provision to apply a greater level of sensitivity to these LCA's. The evidence of John Davies (WG1.23.1 goes further to consider the policy implications and balance between the impact on the landscape, townscape, and taking into account other factors. The evidence of Matthew Jones (WG1.1.1) summarises the key impacts of the Scheme, balanced against the assessed benefits.
7. **Point 17** (*Stated that Welsh Government has put forward a business case that is far from convincing. The economic value of spending over £1bn in SE Wales is lacking. Prof Cole's 'Blue Route' proposal puts it succinctly: -"The Federation of Small Businesses concludes that there is "a lack of common sense" in the current consultation with the Government committing the vast majority of Wales' future borrowing capacity to a single project. This, it says, is not in the best interest of the wider Welsh economy*) / The economic appraisal of the Scheme considers the value for money of the Scheme. The core scenario for the Scheme is based on the central (or most likely) traffic growth forecasts and assumes that the tolls on the Severn Crossings are half their current level. Under this scenario, the Scheme has an initial benefit to cost ratio

(Initial BCR) of 1.62. The initial BCR takes into account only the direct economic benefits of the scheme. If Wider Impacts (indirect economic benefits) are included in the assessment, the BCR for the Scheme is 2.23. In other words, the benefits of the scheme outweigh its costs by a ratio of over 2 to 1. Matthew Jones' evidence WG1.1.1 at paragraph 13.5 explains that funding for the delivery of this project has been explicitly identified and provision set aside within the Welsh Government's published capital plans for the next four years. Allocations are not made beyond a 4 year period but suitable forecasts are in place to enable assurance to be given that the full funding requirements associated with the project are available within a reasonable timescale should the decision be taken to proceed. The Project would be funded through a combination of UK Government borrowing and Welsh Government Transport capital budgets. The Welsh Government would not be allocating the full amount of our borrowing capacity to this scheme, important though it is. The balance of the current borrowing limit, over £500m, will be available to fund schemes in other parts of Wales from 2018/19 onwards when Stamp Duty & Landfill Tax are planned to be devolved to Welsh Government.

8. **Point 18** (*Stated that a new motorway is out-of-date policy. To emphasise, this proposal would economically disbenefit areas of Wales outside the South-East*) / Stephen Bussell sets out the likely economic impacts of the Scheme in his evidence (WG1.3.1). The M4 motorway forms the primary east-west route in South Wales and is the main route in and out of the country for 70% of Wales' population and economy. Because of the strategic importance of the M4, it is reasonable to expect that the benefits of the Scheme will be widespread across South East and South West Wales. There is no reason to expect that the Scheme would have a detrimental impact on areas of Mid or North Wales. The background to the Scheme is set out in section 3 of Matthew Jones' evidence (WG1.1.1), whilst the need for the Scheme is summarised in section 8 of his evidence. John Davies further considers policy matters in his evidence (WG1.23.1).
9. **Point 20** (*Stated that Friends of the Earth also highlight major flaws in the flimsy 'business case', including costs not included which would*

*substantially increase the cost of the scheme. This calculation puts the real cost of the scheme to be nearer to £2bn than £1bn, and the benefit / cost ratio to be close to 1, not 2. These are serious criticisms which would undermine the whole economic basis of the scheme, and must be answered)* / Responses to the objections of Friends of the Earth in relation to the economic appraisal of the Scheme are set out in Sections 6.4 – 6.13 of Stephen Bussell's Proof of Evidence (WG1.3.1)

10. **Point 21** (*CPRW fully supported the case made by Gwent Wildlife Trust and Wildlife Trust Wales for the need and the duty to retain the special, unique and protected areas of the Gwent Levels for wildlife and biodiversity, and for the recreation and enjoyment of future generations*) / Proof of Evidence of Keith Jones (WG1.18.1) considers the effect of building and operating the new section of motorway on the environment and this is set out in the Environmental Statement (Document 2.3.2) and its Supplements (Documents 2.4.4 and 2.4.14). The Environmental Statement acknowledges the importance of the Gwent Levels and clearly identifies the magnitude and significance of effects on a wide range of environmental features and assets.
11. **Point 22** (*Stated that it is a travesty of the Welsh Government's environmental and biodiversity policies that this proposal entirely ignores 'protected' landscapes*) / Proof of Evidence of Nicholas Rowson (WG1.8.1) refers to the ES (Document 2.3.2). Protected landscapes are identified within Section 9.4 of the ES. Where relevant, LCA's that include a Special Landscape Area are described as such within the assessment text, for example ES paragraph 9.7.1. The presence of protected landscapes within an LCA has informed the identification of landscape quality/condition, value and sensitivity, as outlined in tables 9.4, 9.5 and 9.6. Nick Rowson in his Proof of Evidence WG1.8.1 explains that the LVIA recognises that there will be landscape and visual impact that are in places large to very large on designated, sensitive landscapes. The more formal, Assessment of the Significance of Impacts of Development on Historic Landscape (ASIDOHL) (a detailed process for assessing, as objectively as possible, how much change a proposed development might bring to the fabric and appearance of the surrounding historic landscape) and the interface with the Landscape of Outstanding Historic

Interest (LOHI) designation, has been considered in liaison with Mick Rawlings and is reported in the Heritage Chapter of the ES and set out in his Proof of Evidence (WG1.9.1). Nick Rowson at paragraph 3.1.4.4 of WG1.8.1 recognises that the Scheme will have a permanent effect on the landscape and visual appearance of the Gwent Levels LOHI.

12. **Point 24** *CPRW supported Campaign for Better Transport's objection, especially the statement 'The proposals also ignore the potential of rail freight and improved public transport to meet transport needs'* (/ Proof of Evidence by Matthew Jones WG1.1.1 section 3 explains the background and section 9 addresses public transport. Section 3 explains how non-road building solutions have been considered as part of previous development work, whilst section 9 explains how the Welsh Government is progressing with the South Wales Metro and that it would be complementary to the Scheme. Furthermore, section 7 of Bryan Whittaker's Proof of Evidence addresses 'Public Transport Model Validation' and section 12 'Alternative Public Transport Modelling Approach', explaining how the transport modelling has taken into account public transport improvements. An Updated Public Transport Overview Report (Document 2.4.19) explains how public transport improvements would not address the problems on the M4 Corridor around Newport.

2.1.3. The other points are responded to by specialist topic in turn in the sections following.

## **2.2. Matthew Jones (General)**

2.2.1 Response to **Point 4** (Stated that road policy in England from 2015 is to improve existing main roads, and not to build new motorways):

1. The Welsh Ministers are responsible for special roads (including motorways) and trunk roads in Wales and, as such, English policy is not relevant. In England, Highways England have published their Strategic Business Plan 2015-2020<sup>2</sup> which in Appendix II outlines a wide range of projects, including online and offline construction. It is not a policy of Highways England or the UK government to not build new roads in England.

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[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/396487/141209\\_Strategic\\_Business\\_Plan\\_Final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/396487/141209_Strategic_Business_Plan_Final.pdf)

2.2.2 Response to **Points 14 and 15** (From before May 2014 (see attached copy email) CPRW repeatedly asked Welsh Government for congestion statistics, to compare the M4 in Wales with other lengths, and other motorways. Last year we were told they had figures, but were not planning to release them. A Freedom of Information application and appeal has failed, and at present the complaint is with the Regulator, who has indicated that it is a case he should investigate), (Waiting for justification of the Welsh Government's opinion that congestion is a reason for the new motorway. We believe that congestion on the length of the M4 in question is no worse than many other urban peripheral motorways, and sections of the M4 further west):

1. A Welsh Government letter dated 23 March 2017 to Vic Warren confirmed that:

“that as part of the Welsh Government's Chief Witness Proof of Evidence for the public inquiry into the M4 corridor around Newport, the Welsh Government has published an analysis of the road speed data that meets the requirement of the original request. This was sent to you in hard copy on 27 January 2017, however the information can be found online at Section 1.2 of <http://m4-newport.persona-pi.com/1-proofs-of-evidence>”.

2. The Chief Statistician and his team have also previously highlighted that they are also looking to develop a statistical publication, in the form of a statistical article, using this data to develop average speeds on Welsh motorways. The Chief Statistician is yet to announce a publication date for this statistical article – however the Welsh Government have separately confirmed they will email Vic Warren when a publication date is confirmed.
3. Matthew Jones in his Proof of Evidence (WG1.1.1) at section 10 explains the problems, objectives and how the Scheme would address them. A summary of the expected impacts of the Scheme is provided in section 24 of the evidence.

2.2.3 I confirm that the statement of truth and professional obligations to the inquiry from my main proof still applies.

### **2.3 Tim Chapman (Carbon)**

2.3.1 Response to **Point 23** (CPRW supported the Friends of the Earth case on emissions and the spread of pollution):

1. Issues raised in evidence submitted to the Inquiry by Friends of the Earth will be responded to separately.

2.3.2 I confirm that the statement of truth and professional obligations to the inquiry from my main proof still applies.

## 2.4 Bryan Whittaker (Traffic)

2.4.1 Response to **Point 8** (Stated that traffic flows throughout the UK are seen to be stabilising, and it is generally accepted that DfT National Road Traffic Forecasts have not been realised over recent years. It appears that car travel is in fact reducing, although light goods traffic is increasing.)

1. The Department for Transport's report on Road Traffic Forecasts 2015 states that "national traffic is forecast to increase in all our scenarios", with a range of 19% to 55% growth between 2010 and 2040. While it is expected that this will contain considerable variation between areas, road types and vehicle types, growth "is expected to be particularly strong on the Strategic Road Network", ranging from 29% to 60% between 2010 and 2040.
2. Traffic growth forecasts used in the M4CaN traffic model have followed WebTAG guidance, which requires that a 'reference case' for travel demand is developed based on the DfT forecasts contained in its National Trip End Model (NTEM). These have been based on the latest NTEM 7.1 Interim for Wales, released in December 2016, which assumes a decline in trip rates between 2011 and 2016, and constant rates thereafter.
3. Following the introduction of the Variable Speed Limit in 2011, traffic on the M4 sections around Newport has continued to grow. While growth in the first two years was relatively modest (1% and 1.5% respectively), the rate of growth has increased in more recent years. Traffic volumes in 2016 were on average 11% higher than they were in 2011.

2.4.2 Response to **Point 9** (Stated that that commuting by car is not popular, and the proposed South Wales Metro, assuming it will produce a much improved mass transit system, will take commuting traffic off the M4, relieving the motorway at current peaks and more generally).

1. Multi-modal modelling has been undertaken, quantifying the journey times by each mode, including the time to get to the station or bus stop or tram stop, the time spent waiting, the time changing between services, the time to get from the station or stop that is the end of the public transport journey to the final destination and comparing that time and the cost of the fare with the time by car and the perceived cost of petrol.

2. The results of that comparison show that for many journeys, the private car offers a much higher level of service than public transport.
3. The Updated Public Transport Overview (Document 2.4.19) sets out the public transport schemes that have been included in the M4Can Transport Model. In summary the public transport schemes included in the model comprise of Great Western Route Modernisation + Metro Phase 1 related to stations and facilities + Metro Phase 2 comprising of the Valley Lines Modernisation (the final specification will be established through the award of the Wales and Borders Franchise, but for the purpose of the M4CaN model, it is represented as a light rail network to the north of Cardiff Central with heavy rail services retained on the City Line, Vale of Glamorgan. Maesteg, Ebbw Vale and Penarth Lines + Metro Phase 3 including improvements to the Welsh Marches Line but excluding new stations + Great Western Main Line Relief Lines Services which incorporate proposed solutions to line speed and the provision of new stations to enable greater use to be made of these routes in the future.
4. Outside of the transport model, an alternative approach has been developed which assumes further and enhanced rail elements of a South Wales Metro and a strategic Park and Ride site at Llanwern, together with Newport Bus Rapid Transit in order to assess the potential effect on traffic flows on the existing M4 corridor.
5. The combined effect of all the public transport measures results in a mode transfer which represents a significant increase in public transport patronage and it is also recognised that the South Wales Metro will impact a wide range of movements in the region, many of which will be north-south rather than east-west.
6. However, the results show that the combined effect of the public transport measures is to reduce M4 traffic by a maximum of 6% which does not resolve the problems on the M4 and is consistent with the Welsh Governments position that the M4 proposal and the Metro schemes should be viewed as complementary.

2.4.3 Response to **Point 10** (Stated that the necessity of more careful traffic modelling is widely under discussion).

1. Guidance on best practice in traffic modelling techniques is continually reviewed and updated by the Department for Transport. The traffic modelling work undertaken for the M4CaN project fully complies with the published guidance available.

2.4.4 Response to **Points 11 and 12** (Stated that the Welsh Government has not proved that traffic growth necessitates this huge scheme; and it is not obvious that the effect of autonomous vehicles and other new transport modes and delivery technologies have been considered over its long design life. Stated that Welsh Government was forced to postpone the Public Inquiry to re-assess the traffic model, and that the original traffic forecasts have been reduced. We maintain that there is no reasonable case for the scheme in terms of traffic capacity):

1. The DfT commissioned research into the impacts of connected and Autonomous Vehicles (AVs) on traffic flow which was published in May 2016. One of the key conclusions from that research was that there was great potential for substantial improvements in network performance, particularly in high speed, high flow situations. However, there was strong evidence that at low penetrations, any assertive AV's are limited by the behaviour of others, so that vehicles are not able to make use of their enhanced capability. This leads to suggestion of a tipping point – the proportion of enhanced vehicles required before benefits are seen. The research suggests that that this may be between 50% and 75% penetration of AV's. Results for the Strategic Road Network (SRN) peak period indicate improvements in delay of only 7% for a 50% penetration of AV's, increasing to as high as 40% for a fully automated vehicle fleet.
2. A paper was presented at the 2016 European Transport Conference which summarised the outcome of a 'Delphi' survey conducted amongst the leading professionals in the area of autonomous vehicles. The Delphi method is a structured communication technique developed as a systematic, interactive forecasting method which relies on a panel of experts. Delphi is based on the principles that forecasts from a structured

group of individuals are more accurate than those from unstructured groups.

3. A total of 45 modelling experts took part. Ten of them were well known academics, 9 worked in Government Agencies and the rest worked in the private sector in different roles, mostly as consultants. They were grouped into 5 regions, the USA and Canada, Western Europe, Australasia, Latin America and the Rest of the World.
4. On the question of when AV's will be available, the mean for all regions was 2023. In response to the question of when AV's would be 10% of the fleet, the mean response was 2032 and 2040 when the percentage of AV's increase to 20%. The mean view arrived at in terms of improvement in capacity, was that a 10% improvement in capacity could be achieved when AV's are 20% of the fleet.
5. The conclusion that I would draw from the above is that any effect on the M4 is so far in the future, it does not change the need for the scheme.

2.4.5 Response to **Point 13** (Stated that although this length of the M4 is described by WG as 'congested', how this has been determined is far from clear.)

1. There is no absolute measure of 'congestion', in the same way as there is no single trigger point of capacity at which the network fails. It is simply a matter of increased traffic flows leading to decreasing speeds, deterioration of operating conditions or a declining level of service as perceived by road users. The Design Manual for Roads and Bridges (DMRB) uses the concept of the Congestion Reference Flow (CRF) as a measure against which to judge acceptable performance. When the annual average daily traffic (AADT) flow reaches the CRF, it is estimated that congestion will occur in approximately half of all weekday peak periods. However, it should be noted that some problems are likely to occur before the CRF is reached, and in considering journey time reliability, WebTAG guidance adopts a stress-based approach that considers the change in the ratio of AADT to CRF between 75% and 125%.

2.4.6 Response to **Point 16** (Have checked on the EuroRAP Risk Rating of Britain's Motorways and A Roads, published by the Road Safety Foundation.

This classifies the M4 in South-East Wales as one of the 'Low risk (safest) roads'. So again, no justification.)

1. The EuroRAP risk rating considers both motorways and A roads. Motorways in general are widely recognised as the safest type of road as they provide dual carriageways and grade-separated junctions, removing most vehicle conflict points. The whole of Britain's motorway network is defined as low or low/medium risk, which is hardly surprising when the comparison is made with much greater lengths of single carriageway A roads.
2. A more relevant question would be how this particular section of motorway, with its poor alignment, lane variations and frequent junctions, compares with other motorway sections. The Variable Speed Limit was introduced in 2011 on safety grounds, reducing the capability of the M4 to fulfil its role as a high-speed strategic route through South Wales. Despite this, some sections of the route around Newport still have an accident rate that is higher than the average accident rate for motorways in the UK.

2.4.7 Response to **Point 19** (Stated that more locally, Cardiff is already congested in commuting hours, yet this proposal in advance of Metro will add another major traffic flow. Cardiff will gridlock).

1. Forecasts indicate that, in 2022, the proposal would increase traffic on the A48(M) into Cardiff by 2%, equivalent to no more than a year's growth in traffic volumes.

2.4.8 I confirm that the statement of truth and professional obligations to the inquiry from my main proof still applies.