

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



Llywodraeth Cymru
Welsh Government

File Ref WG/REB/OBJ0125 - FoE

Objection Ref OBJ0125

**Response to Objector's Evidence: Gerald Kells on behalf of
Friends of the Earth Cymru**

1. GROUNDS FOR OBJECTION

1.1. Details

1.1.1. Gerald Kells on behalf of Friends of the Earth Cymru submitted a Statement of Evidence dated 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. This has been considered alongside Friends of the Earth's Statement dated September 2016, which makes similar points.

1.1.2. The Welsh Government understands the evidence submitted within both Statements to be based on the following:

General

1. Concerned that the 'need' argument for the Scheme is based on flawed Transport Planning Objectives dating from 2007 which it is suggested have not been substantially revised since. States that the objectives selected by the Welsh Government are in several cases unclear, suffer from a high degree of overlap and duplication and are therefore unfit for purpose. Considers that the outcome of the treatment of problems is that, since the very outset, the odds have been stacked in favour of the least sustainable alternative.
2. The Welsh Government states that the National Transport Plan (2010): "accepted that there was a need urgently to address the transport problems on the M4 and a commitment to this effect was included in the published document". Considers that no such commitment is contained in the published document. Nor is urgency apparent in the National Transport Plan. The closest that we can find is: "We will... 91. Deliver a package of measures designed to improve the efficiency of the M4 in south-east Wales, including public transport enhancements, making the best possible use of the motorway and improving the resilience of the network".

3. Suggests that the Welsh Government has failed to consider reasonable alternatives (including the 'Blue Route' via the Llanwern steelworks road, and alternatives relating to 'common/complementary measures', 'public transport measures', 'junction closures', and these measures in combination). Considers that, in the latest iteration of this project, there have been no effective choices for stakeholders other than to support or oppose a motorway south of Newport. Considers that the Welsh Government's actions undermine the Strategic Environmental Assessment (SEA) European legislation, because they facilitate significant damaging development by excluding reasonable alternatives that could meet the scheme's objectives without environmental damage of the same scale as the alternatives chosen by the decision-maker. Claims that the potential to reduce traffic passing through the Brynglas tunnels by up to 5% through partial junction closure has been ignored in the Welsh Government's assessment.
4. Considers that, through separating out public transport measures for separate consideration, the Welsh Government also nullified any possibility that public transport measures (alone or in combination with other non-motorway options) could be viewed as an alternative. This, again, demonstrates the Welsh Government's active exclusion of alternatives that could be genuinely sustainable. Considers that Public transport investment and partial closure of one motorway junction is able to reduce traffic through the Newport area by as much as 22%
5. Considers that it appears that the Welsh Government is willing to commit massive expenditure and environmental degradation for travel time savings of 3 minutes for people (mainly middle-class employed white men) using the motorway across 20 hours of the day, and of up to 9 minutes for a few thousand people at peak hours across 150 days of the year.
6. Considers that only a small portion of people will benefit from the motorway as 22.9% of households in Wales have no access to a car or van, with lack of access strongly evident in areas of higher deprivation.

7. Considers that the capital expenditure for the motorway – alongside revenue expenditure for maintenance – will erode public spending in other areas.

Traffic

8. Concerned that the Welsh Government is overestimating the likely road traffic, and severely underestimating growth in public transport use and that the combination of both is likely to distort the findings of the transport appraisal. For example, the Welsh Government has claimed that encouraging greater use of public transport by local residents could only reduce M4 traffic by up to 5% when considering evidence from WebTAG Unit 5.2 that suggests that reductions in car trips for work and school through targeted marketing can range between 8% and 18%.
9. Considers that the existing M4 around Newport is safer than the UK average.
10. Concerned that the Welsh Government states that it is generally accepted that once hourly flows reach about 80% of the theoretical capacity, operational problems can also be expected when there is no rationale or evidence for this. Considers that, if the CRF is the standard for designing a new road, it is hard to see why action needs to be taken if an existing road is within that capacity. States that practical experience shows that urban motorways do function at levels much higher than the CRF. Suggests that the Brynglas Tunnels are likely to have some degree of self-regulating, not just because it has a physical capacity but because local traffic will avoid using it at busy periods.
11. Concerned that under the scenario of building a new motorway some sections of the existing motorway corridor would be likely to experience some traffic congestion even with the new motorway to the south of Newport in place, which would mean that only limited relief is being offered by the provision of a relief road.

Economics

12. Suggests the best economic argument the Welsh Government can come up with is that the 'do minimum' scenario could pose a constraint to the economy of South Wales, when equally a multi-billion pound expenditure on one unnecessary scheme could pose a constraint to the economy of South Wales.
13. Suggests that journey time saving benefits are small and over exaggerated.
14. Concerned that nowhere in the economic appraisal report is there mention of the discount rate used. Discount rates are absolutely critical in economic appraisal; it is impossible to assess or challenge the veracity of the conclusions reached in the absence of this information.
15. Concerned that there is no explanation as to why the expected maintenance costs have reduced by 60% since the economic appraisal of July 2014.
16. Concerned that the economic appraisal 'annualises' different categories of time use of the motorway, however the total hours covered by the appraisal is 5,363. There are 8,760 hours per year and no explanation is given for eliminating these additional 3,397 hours from the appraisal.
17. Suggests both the economic appraisal and the traffic forecasting model should be re-run using the new proposed 'values of time' because the current values for non-work travel date back to research from 2003, and the data supporting them date from over two decades ago.

Sustainable Development

18. Suggests the sustainable development report is not fit for purpose as to conclude that the proposed development is sustainable (principally on the basis of economic benefit) is contrary to the word and spirit of sustainability. If highly significant, permanent environmental damage can be rendered 'sustainable' via economic cost-benefit analysis then the provisions of sustainability policy and practice are fundamentally and fatally compromised.

Carbon

19. Suggests that from 2038 onwards, the 'do something' scenario produces more carbon emissions than the 'do minimum' alternative and this scheme is ultimately more climate-damaging than the 'do minimum' alternative. The carbon report assumes either expenditure of up to £2.3 billion, in order to achieve 'negligible' change in carbon emissions, or zero expenditure. An increase in climate change emissions" will result "from increased traffic, which would over time undermine the benefit of individual cars having reduced emissions per mile. But even if one accepted the Welsh Government's figures, the carbon reduction would only amount to 0.2% in 2022 and 0.4% in 2037.

Ecology

20. Suggests scientific evidence exists that the proximity of traffic to habitats has a deleterious effect on wildlife but the Environmental Statement casually disregards the impact of the new motorway on some existing Sites of Nature Conservation Interest.
21. Concerned that otters are, according to Transport Scotland: "likely to suffer disturbance from traffic noise as well as from road lighting during the operational phase". However, in relation to otters, the Welsh Government has concluded that the new road is not considered to be of concern with regard to noise or vibration disturbance, should otters choose to use the area during the operational phase. The approach to assessment is fundamentally flawed and fails to follow good practice already established by both Transport Scotland and the English Department for Transport.

Noise

22. Suggests the Welsh Government's approach of allocating 'medium' noise sensitivity to residential receptors is unique and unwarranted when the Planning Inspectorate, Highways Agency and Transport Scotland routinely classify residential receptors as being of 'high' sensitivity to noise.

23. Concerned that the Welsh Government concludes in the 'do minimum' scenario that a total of 38 residential properties would experience a minor increase in noise by 2037 with 20,628 properties experiencing either no impact or negligible impact, and with the scheme 1,203 receptors suffer a significant increase in noise.

Air Quality

24. Suggests the Scheme is unnecessary for the purpose of meeting air quality standards. Under the 'do minimum' scenario, air pollution is within legal limits at all human receptors by the defined opening year of the new highway. Air pollution is an ongoing problem in Newport – but it is largely unrelated to the existing M4.
25. Concerned that the Welsh Government makes great play of a reduction in NOx emissions as a result of the scheme. However, there will be a very significant reduction in regional emissions in the absence of the scheme: from 1,136 tonnes/year in 2014 to 599 tonnes/year in 2022 (a 47% reduction). The total benefit from the scheme in the opening year (a reduction of 190 tonnes of NOx in total, when compared to the 'do minimum' option), is equivalent to 0.8% of Welsh transport emissions – or “not significant” in Welsh Government terms.
26. Concerned that Air Quality Management Areas along the M4 in Newport cover a grand total of 8 residential properties and in every case, air quality is modelled to be superior to required standards in both 2022 and 2037 under the 'do minimum' scenario. Of every household monitored that stands to receive moderate or major benefit as a result of reduced air pollution from the proposed development, the 'do minimum' scenario would lead to better air quality in 2022 and 2037 than current (2014) air quality in every single case.

Tidal Flooding

27. Suggests the potential impact of climate change on sea level rise is being ignored and serious questions must be asked as to whether or not the proposal is genuinely future-proofed for climate change, particularly in the light of recent studies suggesting both that sea level rise is taking place at a rate significantly more rapid than previously thought likely, and that sea level rise of a scale of metres is possible this century. The approach taken by the Welsh Government is particularly surprising because elsewhere it appears to recognise the threat caused by climate change to infrastructure: “From the results, the potentially most significant risks for Wales from climate change to the water environment appear to be... increases in flooding on the coast and inland, affecting people, property and infrastructure.

Water Quality

28. Considers that the River Ebbw is already exceeding Water Framework Directive (WFD) limits including oil and grease, copper, zinc and Phenol odour.
29. Suggests there has been insufficient assessment of impacts to the River Ebbw and that it is critical that the Welsh Government re-assesses the construction and operational impacts of the new motorway on the portion of the River Ebbw directly intersecting with it. A plan must also be put in place to dispose of reed bed cuttings in the runoff ponds as contaminated waste because of the high level of contamination likely to be absorbed.
30. Considers minimal mitigation is proposed and suggests the monitoring proposed of 12 months’ duration “to demonstrate acceptable quality of the water treatment area discharges” is not acceptable, since traffic volumes are predicted to increase through 2037.

2. REBUTTAL**2.1. Points Raised**

2.1.1. Some of the above points have already been addressed in previous proofs of evidence. 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	2.2.1	16	2.4.2
2	2.2.2	17	2.4.1
3	2.2.3	18	2.5.1
4	2.2.3	19	2.6.1
5	2.2.4	20	2.7.1
6	2.2.4	21	2.7.2
7	2.2.5	22	2.8.1
8	2.3.1	23	2.8.2
9	2.3.2	24	2.9.1
10	2.3.3	25	2.9.1
11	2.3.4	26	2.9.1
12	2.4.1	27	2.10.1
13	2.4.2	28	2.11.1
14	2.4.2	29	2.11.2
15	2.4.2	30	2.11.3

2.2. Matthew Jones (Chief Witness)

2.2.1. Response to **Point 1** (Concerned that the 'need' argument for the Scheme is based on flawed Transport Planning Objectives dating from 2007 which it is suggested have not been substantially revised since. States that the objectives selected by the Welsh Government are in several cases unclear, suffer from a high degree of overlap and duplication and are therefore unfit for purpose. Considers that the outcome of the treatment of problems is that, since the very outset, the odds have been stacked in favour of the least sustainable alternative):

1. My Proof of Evidence (WG1.1.1) at section 3 provides the background to the development work including engagement with others and section 10 explains how the 17 problems, 15 objectives and possible solutions for the Scheme have been identified, appraised and developed.
2. WG1.1.1 section 10 explains how the 15 objectives for the Scheme have been developed. In particular, paragraph 10.7 explains how: "The initial review of the problems, aims and objectives for the M4 Corridor around Newport can be viewed in the Stage 1 Review of Problems and Goals report for the M4 Corridor Enhancement Measures, 2011 (Document 4.3.2). The 2013 Stage 1 (Strategy) WeITAG (Document 4.4.12) and the 2014 Stage 1 & 2 (Scheme) appraisals (Document 4.5.5) for the M4 Corridor around Newport confirms that they have been reviewed and subject to consultation during development work, and that: "For the current circumstances, the objectives as previously proposed are considered to remain wholly relevant to the M4 transport corridor around Newport and, as such, represent a good framework within which to appraise the relative performance of strategic options for improvement of operating conditions/transport provision within the M4 Corridor around Newport." "

2.2.2. Response to **Point 2** (The Welsh Government states that the National Transport Plan (2010): “accepted that there was a need urgently to address the transport problems on the M4 and a commitment to this effect was included in the published document”. Considers that no such commitment is contained in the published document. Nor is urgency apparent in the National Transport Plan. The closest that we can find is: “We will... 91. Deliver a package of measures designed to improve the efficiency of the M4 in south-east Wales, including public transport enhancements, making the best possible use of the motorway and improving the resilience of the network”):

1. Section 1.4 of the Welsh Government's Statement of Case (Document 2.4.6) includes a policy context overview. At 1.4.17 and 1.4.18 the National Transport Plan 2010 and National Transport Finance Plan 2015 is outlined with its references to the M4 around Newport, concluding that "The M4 Corridor around Newport project forms an essential part of the Welsh Government's vision, and associated policies, for an efficient integrated transport system in Wales." Further information is provided in the policy context chapter 6 of the Environmental Statement (Document 2.3.2).
2. Section 2.1 of both the WeITAG Stage 1 Report (Document 4.4.12) and WeITAG Stage 1 & 2 Report (Document 4.5.5), which informed Welsh Ministerial decision making on the adoption of the Plan and modified Preferred Route in July 2014, set out that: "The National Transport Plan (March 2010) recognised that “for a long time there have been concerns about the section of the motorway around Newport, which falls well short of modern design standards. These centre on peak-time capacity, safety and the resilience of the local network”.
3. As part of the National Transport Plan, the Welsh Government aims to “deliver a package of measures designed to improve the efficiency of the M4 in south east Wales, including public transport enhancements, making the best possible use of the motorway and improving the resilience of the network”.

2.2.3. Response to **Points 3 and 4** (Suggests that the Welsh Government has failed to consider reasonable alternatives (including the 'Blue Route' via the Llanwern steelworks road, and alternatives relating to 'common/complementary measures', 'public transport measures', 'junction closures', and these measures in combination). Considers that, in the latest iteration of this project, there have been no effective choices for stakeholders other than to support or oppose a motorway south of Newport. Considers that the Welsh Government's actions undermine the Strategic Environmental Assessment (SEA) European legislation, because they facilitate significant damaging development by excluding reasonable alternatives that could meet the scheme's objectives without environmental damage of the same scale as the alternatives chosen by the decision-maker. Claims that the potential to reduce traffic passing through the Brynglas tunnels by up to 5% through partial junction closure has been ignored in the Welsh Government's assessment) and (Considers that, through separating out public transport measures for separate consideration, the Welsh Government also nullified any possibility that public transport measures (alone or in combination with other non-motorway options) could be viewed as an alternative. This, again, demonstrates the Welsh Government's active exclusion of alternatives that could be genuinely sustainable. Considers that Public transport investment and partial closure of one motorway junction is able to reduce traffic through the Newport area by as much as 22%):

1. WG1.1.1 section 3 sets out the engagement that has taken place in considering the problems, objectives and possible solutions to the M4 around Newport since the early 1990s. This also explains how a wide range of options has been considered by a wide range of stakeholders, including consideration of non-road building options and packages of measures.
2. Section 9 of WG1.1.1 explains how public transport and the metro proposals have been taken into account, clarifying that the Scheme "in collaboration with our proposals for a South Wales Metro, it forms a vital part of the Welsh Government's vision for an efficient and integrated transport network for Wales. There is a compelling case in the public interest for the Scheme to proceed."

3. The Scheme has clearly been developed in collaboration and integration with the Metro. For example, the proposed Glan Llyn junction connects to the 4000 home, 6000 job new community planned at Glan Llyn, including a new Metro station. The proposed new Magor junction enhances access to Severn tunnel junction park and ride, encouraging modal shift, and a new section of cycleway in the area completes a continuous cycleway link from Magor to central Newport. It has also been developed in collaboration with our plans for rail electrification and includes measures to promote cycling and walking.
4. Congestion on the motorway currently affects the roads in Newport, causing delays and making it difficult for those who rely on public transport. This is set out in my Appendix to WG1.1.1. The Scheme would address a range of problems and sectors. It would assist businesses that rely on road transport; it would make it easier for employees to get to work both by car and public transport; it would make it easier for everyone to travel within and outside the City by road whether they use private or public transport.
5. Furthermore, by reducing congestion on the existing M4 and providing a more resilient motorway network the Scheme would provide better opportunities for people to access employment, education and training, social and other opportunities. The Scheme includes 4 new bridleways and 2 new public footpaths and provides for all footpaths to be maintained after construction. It does not preclude the Welsh Government and local authorities from other actions to improve provision for walking and cycling to complement the improvement of the strategic road network embodied in the Scheme. For these reasons it would arguably reduce social exclusion.
6. It should be noted too that a Health and Equality Impact Assessment has been undertaken and can be found at Environmental Statement Appendix 5.4 (Document 2.3.2), which explains the net health benefits that the Scheme would provide as a result of addressing the transport problems on the M4 around Newport.

7. An Appraisal of Objectors' Alternative Blue Route Proposals Report (Document 6.2.35) considers the Blue Route as confirms it would not address the problems or achieve the objectives of the M4 Corridor around Newport. The Blue Route is being considered at the Inquiry as an objectors' suggested alternative, as presented within the Objectors' Suggested Alternatives Report (Document 2.4.2). A separate rebuttal to Cycling UK who are promoting the Blue Route at the Inquiry will be provided. All objectors' suggested alternatives can be found within the Objectors' Suggested Alternatives Report (Document 2.4.2), which have been appraised and costed appropriately.
8. As I set out in sections 3.17 to 3.20 of my Proof of Evidence (WG1.1.1); following the adoption of the Plan, Friends of the Earth brought a Judicial Review, which was heard by Mr Justice Hickinbottom in March 2015 (ref CO/4433/2014) (Document 4.5.45)¹.
9. The claim was issued on 23 September 2014 by Friends of the Earth ('the Claimant'). In the claim it was contended that the adoption of the Plan should be quashed because the decision-making process that led to the adoption of the Plan was considered to be unlawful, in that, in a number of respects, it failed to comply with the Strategic Environmental Assessment Directive ("the SEA Directive"). Several sub-grounds were pleaded; but the foundation of the Claimant's case was that the process by which the Plan was adopted failed properly to identify, describe and evaluate all reasonable alternatives (and particularly alternatives that did not involve a motorway being constructed across the protected sites) on a comparable basis to the Plan. In particular the Blue Route (Document 4.5.4), was suggested to be a reasonable alternative, and had been put forward/supported as a suggested alternative by environmental non-governmental organisations during the draft Plan consultation.

¹ R (on the application of Friends of the Earth England, Wales and Northern Ireland Ltd) v Welsh Ministers CO/4433/2014 (Documents 4.5.45 to 4.5.48)

10. Whilst I expand Mr Justice Hickinbottom's conclusions in section 3.20 of my Proof of Evidence (WG1.1.1), in summary he stated:

“However, forcefully as these submissions were made, I cannot accept them...the foundation upon which Ground 1 is built is fundamentally flawed. The Minister's approach to the identification of reasonable alternatives was not wrong in law: indeed, it was eminently correct..... They used the correct legal test throughout, choosing the option which they considered best met the TPOs as their preferred option and including other options that they considered capable of meeting the objectives as reasonable alternatives. The decisions they made with regard to selection of objectives, the weight given to each objective chosen and the selection of preferred option and reasonable alternatives were all in accordance with the relevant legal tests, rational and otherwise lawful. They explained, giving at least outline reasons (and, in practice, far more), why they had selected their preferred option and reasonable alternatives...”

11. Mr Justice Hickinbottom went further to state:

“In the light of the previous assessment that neither of the two main elements of the Blue Route would be anywhere near capable of achieving the TPOs, it was not irrational not to include a combination of those elements as a reasonable alternative in the SEA Report. In any event, assessment of the Blue Route after the publication of the SEA Report confirmed that the Blue Route was not capable of meeting the objectives...It more than adequately explained why it considered other options would not achieve the TPOs – in short, because none would improve the position with regard to the M4 around Newport which was in essence what the Welsh Government sought to do.”

12. Since that judgement the focus has been on project development, in accordance with the adopted Plan (Document 4.5.7).

13. Friends of the Earth in their evidence suggest a junction closure at Junction 26 east facing slips could reduce traffic by up to 5% based on previous Welsh Government assessment in 2011, which explained that the traffic would reduce through the Brynglas Tunnels but divert onto adjacent junctions². Friends of the Earth then add the 5% to assumed traffic reductions as a result of the South Wales Metro public transport improvements, which the Welsh Government has assessed to lead to limited impact on users of the M4 around Newport (WG1.1.1 section 9).
14. As stated in WG1.1.1 para 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.
15. Proof of Evidence 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 Scheme would be funded through a combination of UK Government borrowing and Welsh Government Transport capital budgets. We 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.

² page 33 of M4 Corridor Enhancement Measures Appraisal Summary Workbook July 2011, <http://m4cem.com/downloads/reports/M4%20CEM%20Stakeholder%20Workbook.pdf>

2.2.4. Response to **Points 5 and 6** (Considers that it appears that the Welsh Government is willing to commit massive expenditure and environmental degradation for travel time savings of 3 minutes for people (mainly middle-class employed white men) using the motorway across 20 hours of the day, and of up to 9 minutes for a few thousand people at peak hours across 150 days of the year) and (Considers that only a small portion of people will benefit from the motorway as 22.9% of households in Wales have no access to a car or van, with lack of access strongly evident in areas of higher deprivation):

1. A Health and Equality Impact Assessment has been undertaken and can be found at Environmental Statement Appendix 5.4 (Document 2.3.2). The Scheme would improve accessibility for car users and public transport users, and would also provide walking, cycling and equestrian improvements. The Scheme would also benefit the economy and help attract investment to Wales. Therefore the Scheme is expected to benefit social inclusion.
2. Whilst not everyone in South Wales has access to a car, the proportion of people who have use of a car is 79%. The M4 is the most heavily used transport infrastructure in Wales. Because of the strategic nature of the M4, a wide area of South and South West Wales is dependent on the M4. For these reasons, the benefits of the Scheme are expected to be felt over a wider area and will benefit a broad range of people.
3. There are also indirect benefits of the Scheme to take into account. The Scheme will contribute to the economic prosperity of Newport and South Wales as a whole. The benefits of improved economic performance will not be limited to those who benefit directly from reduced transport costs.
4. The Scheme would lead to a range of economic, social and environmental benefits, acknowledging that there will be adverse impacts such as on ecology. I consider the likely range of benefits and impacts in my section 16 (sustainable development) and 24 (summary) of WG1.1.1. John Davies (WG1.23.1) further considers the balance between the likely economic, social and environmental impacts of the Scheme and ultimately agrees with my evidence (WG1.1.1) that the Scheme should proceed.

2.2.5. Response to **Point 7** (Considers that the capital expenditure for the motorway – alongside revenue expenditure for maintenance – will erode public spending in other areas):

1. 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. How the Welsh Government allocates funding is not a matter for this Inquiry on the M4 Corridor around Newport.

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

2.3. Bryan Whittaker (Traffic)

2.3.1. Response to **Point 8** (Concerned that the Welsh Government is overestimating the likely road traffic, and severely underestimating growth in public transport use and that the combination of both is likely to distort the findings of the transport appraisal. For example, the Welsh Government has claimed that encouraging greater use of public transport by local residents could only reduce M4 traffic by up to 5% when considering evidence from WebTAG Unit 5.2 that suggests that reductions in car trips for work and school through targeted marketing can range between 8% and 18%):

1. All forecasting is of course subject to uncertainty. In producing the Reference Case that is an input in the Demand Modelling process, demand growth in the forecast years for car drivers and passengers was derived from the National Trip End Model (NTEM) dataset through the TEMPRO software that presents the NTEM dataset. The NTEM datasets are long term forecasts, they represent the Department of Transport's estimate of the long term response to demographic and economic trends. The growth factors are not forecasts, they are factors based on predicted demographic changes and they do not take account of changes in the generalised cost of travel changes or in the disutility that individuals attach to different elements of generalised cost.

2. WebTAG Unit M4 states that future year forecasts should be based on NTEM growth in demand, thereby allowing transport models to be developed on a fully consistent basis.
3. Reference Case demand growth has been derived from NTEM 7.2 replacing NTEM V6.2 following a systematic review of the key drivers of road demands. It was concluded following the review that those factors customarily highlighted as being key drivers of road demand – incomes, costs and population – have been important drivers of recent trends in traffic, but there are other factors that need to be considered and reflected in the NTEM growth factors. These other factors include such issues as the increasing concentrations of people living in urban areas, increased costs such as company car taxation and insurance, capacity constraints and technological developments which allow for homeworking and online shopping.
4. Whilst there is little direct evidence on the impact that certain issues, such as online shopping, may be having on travel decisions, it is known that most of the recent fall in per car mileage has arisen through a decline in the number of trips people are making. The National Travel Survey (NTS) data has shown that the average number of trips has been falling and that there has been a general downward trend in trip rates. The two most common journey purposes (shopping and commuting) exhibit statistically downward trends with reductions of 6% and 10% respectively between 2003 and 2010. The trends in this data are not uniform and vary according to trip purpose and segmentation (e.g. gender, area and household type).
5. For example, the personal and employers' business purposes are stable while the holiday trip rate is increasing, and that the trips that are reducing tend to be shorter trips. However, the recent decline is also partly due to economic conditions, and as these are forecast to improve in the future, the Department for Transport take the view that there is reason to believe the decline will not continue at its current rate in the long term and this view is reflected in the latest in the latest NTEM central growth forecast.

6. The latest NTEM central growth scenario therefore is based on the latest trip rate data collected in the trip rate review and assumes a declining trend in trip rates between its base of 2011 and 2016 and then constant trip rates thereafter.
7. 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 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.
8. 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.
9. The combined effect of all the public transport measures result in a mode transfer which represents a significant increase in public transport patronage and 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. However, the results show that the combined effect of the public transport measures is to reduce M4 traffic by a maximum of 6% in the PM Peak Hour 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.

10. WebTAG unit M5-2 “modelling Smarter Travel choices” does suggest a benchmark value of 18% reduction in car commuting trips from workplace travel plans. The source of this figure is a review carried out by Möser and Bamberg, who “analysed all the Smarter Choice applications that were reviewed by Cairns et al (2004), along with some more recent cases up to 2005. They provided a critical review of the effects of Smarter Choice measures, using reports of 141 studies in 12 developed countries (of which 93 studies relate to the UK).”
11. WebTAG however notes (in para 1.6, Appendix B of WebTAG unit M5-2) that “It is well known that meta-analysis is likely to overstate the effects because studies with no significant or negative effects are much less likely to be published or to become accessible for retrieval. The effects revealed by Möser and Bamberg are therefore likely to be close to the upper limit in the possible range of impacts.” WebTAG therefore says (para 1.4.3) that “the analyst is encouraged to study any other relevant sources of evaluation evidence”
12. The ITS Leeds KonSULT database gives some specific examples:
 - a) Pharmaceutical company, Kent, 6500 staff, high-cost initiative including staff cash incentives for non-use of parking spaces (£1,000 per space per annum) and provision of £100,000 over five years for improved public bus services – result 9% reduction in car driver commuting
 - b) Business Park near Heathrow, high-cost initiative (“Development costs for the Transport Plan to date amount to approximately £150,000”. Approximately £850,000 has been spent on two local bus services since 1989 and £2.3 million has been pledged for development of the Heathrow North Station, extensions to bus routes and development of new routes, and an east-west cycle route) – result 4.5% reduction in car commuting
 - c) Nottingham city hospital – measures including charging for parking – result 13% reduction in car driver commuting
13. Therefore the 18% upper bound quoted seems an unrealistic high, and of course there would much less scope for small and medium sized enterprises.

14. The KonSULT database also quotes evidence from the US (Washington State), where travel plans are mandatory for workplaces with >100 employees, showing that such travel plans achieve a 5.5% reduction in solo driving at these workplaces. If this represents people changing from solo driving to two people sharing a car, then this is equivalent to a reduction in car driver commuting of half that figure (2.75%) for such workplaces. If half of employees work in large workplaces, a 1.4% reduction in car commuting across an area may be achievable.

2.3.2. Response to **Point 9** (Considers that the existing M4 around Newport is safer than the UK average):

1. Motorways are inherently safe – at least 3 times safer than ordinary two-way roads. That level of safety is achieved by a combination of:
 - a) A high standard of road design; and
 - b) Reducing conflicts to a minimum.
2. Any shortfall in any of these aspects is a risk factor. In this respect, the M4 around Newport does not incorporate a high design standard. Some sections have alignments that are below current standards and in places there is no hard shoulder. In addition, there are frequent junctions resulting in many weaving sections with vehicles accelerating, decelerating and changing lanes over relative short distances. In a number of instances, vehicles are forced to queue back onto the main carriageway of the motorway when other vehicles are approaching at high speed.
3. Some sections of the M4 do have a lower collision rate following the introduction of VSL (Variable Speed Limits) than the average link and junction collision rate. The sections of M4 which remain higher than the average link and junction collision rates, notwithstanding VSL are between Junctions 24 and 25 and Junctions 26 and 27, whilst between Junctions 27 and 28, the observed accident rate is close to WebTAG.

2.3.3. Response to **Point 10** (Concerned that the Welsh Government states that it is generally accepted that once hourly flows reach about 80% of the theoretical capacity, operational problems can also be expected when there is no rationale or evidence for this. Considers that, if the CRF is the standard for designing a new road, it is hard to see why action needs to be taken if an existing road is within that capacity. States that practical experience shows that urban motorways do function at levels much higher than the CRF. Suggests that the Brynglas Tunnels are likely to have some degree of self-regulating, not just because it has a physical capacity but because local traffic will avoid using it at busy periods.

- Roads do not fill up smoothly. Delays and unreliability of journeys times start to become evident when traffic flows are still some way from capacity in the order of 80%. The average May (representative of the M4CaN transport model) Ratios of Flow to Capacity are shown in Tables 1 and 2 below. Green circles = No congestion likely, Amber = Traffic flow starts to break down during weekday morning peak, Red = Regular congestion during weekday morning peak.

Table 1 Ratio of Flow to Capacity (Eastbound Direction) AM Peak

Section of M4	2014		2022		2037	
	Base		Do Minimum	Core Scenario	Do Minimum	Core Scenario
J29-J28	 0.88	 0.95	 0.65	 1.05	 0.73	
J28-J27	 0.77	 0.86	 0.63	 0.93	 0.73	
J27-J26	 0.79	 0.84	 0.65	 0.93	 0.79	
J26-J25a	 0.73	 0.80	 0.61	 0.90	 0.78	
J25a-J25	 0.70	 0.77	 0.44	 0.86	 0.58	
J25-J24	 0.75	 0.84	 0.56	 0.95	 0.69	
J24-J23a	 0.59	 0.71	 0.53	 0.80	 0.64	

Table 2 Ratio of Flow to Capacity (Westbound Direction) AM Peak

Section of M4	2014		2022		2037	
	Base		Do Minimum	Core Scenario	Do Minimum	Core Scenario
J28-J29	 0.80	 0.91	 0.62	 1.04	 0.73	
J27-J28	 0.95	 0.95	 0.75	 1.07	 0.87	
J26-J27	 0.84	 0.88	 0.67	 1.00	 0.81	
J25a-J26	 0.73	 0.78	 0.53	 0.88	 0.67	
J25-J25a	 0.68	 0.75	 0.39	 0.82	 0.53	
J24-J25	 0.71	 0.79	 0.72	 0.89	 0.86	
J23a-J24	 0.54	 0.64	 0.47	 0.73	 0.56	

2. Capacity within the Ratios of Flow to Capacity (RFC) in Tables 1 and 2 above is the theoretical capacity of the appropriate 2 or 3 lane motorways. Theoretical capacity is based on mid-link capacities and does not take into account the impact of junctions upstream and downstream. Nor does it take into account transitions from 3 to 2 lanes, variations from the average vertical and horizontal alignments, and other factors such as percentage of heavy goods vehicles which can impact on actual capacity. Along this section of M4 observed congestion in terms of link speeds is more prominent on the approach to the Brynglas Tunnels - see Table 3.2 of my main proof (1.2.1) – because of the change from 3 lanes to 2 lanes. This effect is not captured by Tables 1 and 2.

2.3.4. Response to **Point 11** (Concerned that under the scenario of building a new motorway some sections of the existing motorway corridor would be likely to experience some traffic congestion even with the new motorway to the south of Newport in place, which would mean that only limited relief is being offered by the provision of a relief road):

1. The Design Year for the proposed scheme is 2037. I would concede that in the morning peak some sections in the westbound direction show a RFC between 0.8 and 1.0 meaning that some stop start conditions will start to occur, but it also means that some available capacity remains. In the Inter-Peak which represents the majority of daytime hours all sections of the motorway would be operating at free flow conditions. In the PM Peak, it is only the section between Junction 24 and 25 which shows a RFC between 0.8 and 1.0.

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

2.4. Stephen Bussell (Economics)

2.4.1. Response to **Points 12 and 17** (Suggests the best economic argument the Welsh Government can come up with is that the do minimum' scenario could pose a constraint to the economy of South Wales, when equally a multi-billion pound expenditure on one unnecessary scheme could pose a constraint to the economy of South Wales) and (Suggests both the economic appraisal and the traffic forecasting model should be re-run using the new proposed 'values of time' because the current values for non-work travel date back to research from 2003, and the data supporting them date from over two decades ago):

1. The Revised Economic Appraisal Report demonstrates that the Scheme offers value for money whilst the Revised Wider Economic Impact Assessment Report demonstrates that the Scheme would have a substantial positive impact on the economy of South Wales. Investment in the M4CaN Scheme does not preclude investment in other transport projects or investment in other policy areas that may have a positive economic impact. The Welsh Governments policy priorities are set out in its Programme for Government (Taking Wales Forward 2016 – 2022). It is reasonable to expect that any strategy to address the performance of the Welsh economy would include transport alongside other policy measures. In respect of transport policy, which the Welsh Government wishes to address a longstanding issue on the most heavily used transport route in the country is also entirely reasonable.
2. At each stage of the development of the Scheme, the values of time current in WebTAG guidance have been applied. The Revised Economic Appraisal Report applies the new values of time as implemented following the Department for Transport consultation.
3. The core scenario for the economic appraisal is based on the central growth traffic forecast. Sensitivity tests have been undertaken in which either the low or high traffic growth forecast is applied. If traffic growth is lower than the central forecast then the benefits of the Scheme will be less. If traffic growth is higher than the central forecast then the purported benefits of the Scheme will be more.

2.4.2. Response to **Points 14, 15 and 16** (Concerned that nowhere in the economic appraisal report is there mention of the discount rate used. Discount rates are absolutely critical in economic appraisal; it is impossible to assess or challenge the veracity of the conclusions reached in the absence of this information), (Concerned that there is no explanation as to why the expected maintenance costs have reduced by 60% since the economic appraisal of July 2014) and (Concerned that the economic appraisal 'annualises' different categories of time use of the motorway, however the total hours covered by the appraisal is 5,363. There are 8,760 hours per year and no explanation is given for eliminating these additional 3,397 hours from the appraisal):

1. The discount rates used to convert all costs and benefit to a consistent base year are taken from the HM Treasury Green Book and also feature in WebTAG guidance (also known as the social time preference rate). The rates are 3.5% for 0-30 and 3.0% 31-75 years. These rates are applied in the appraisal of projects across all areas of public policy in the UK.
2. Treatment of maintenance costs is described in Section 4.63 and 4.64 of my proof of evidence. This makes clear that maintenance costs are included in the economic appraisal. The analysis of maintenance costs assumes a normal cycle of structural maintenance and resurfacing. Cycles of maintenance are based on the Welsh Government's experience of maintaining the trunk road network. The fact that HGVs will switch from using the existing to the new motorway may mean that maintenance is required less frequently on the existing M4. Such benefits have not been taken into account in the economic appraisal although they are likely to be of very minor significance in the context of the overall appraisal.
3. The approach to annualising traffic model outputs is set out in Section 4 of my Proof of Evidence and clarified in 6.12 and 6.13. Annualisation factors are derived from traffic count data and are based on the ratio of traffic flows in the modelled periods, to the traffic flows experienced over the period being assessed. For example, the annualisation factor used to convert the outputs of the AM peak hour model to the full AM peak period (07.00 to 10.00) is based on the ratio of traffic flows experienced between 08.00 and 09.00 and traffic flows experienced between 07.00 and 10.00. Because traffic flows vary for different times of the day and between

weekdays and weekends, the annualisation factors are not equal to the total number of hours in a year.

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

2.5. John Davies (Sustainable Development)

2.5.1. Response to **Point 18** (Suggests the sustainable development report is not fit for purpose as to conclude that the proposed development is sustainable (principally on the basis of economic benefit) is contrary to the word and spirit of sustainability. If highly significant, permanent environmental damage can be rendered 'sustainable' via economic cost-benefit analysis then the provisions of sustainability policy and practice are fundamentally and fatally compromised):

1. The Sustainable Development Report has been overtaken by my Proof of Evidence (WG 1.23.1), which deals with the Well-being of Future Generations (Wales) Act 2015 (the WFG Act) and the sustainable development principle. It also analyses the Scheme against the sustainable development principle and sustainability objectives as set out in Planning Policy Wales (PPW) to reflect the requirements of the WFG Act. Whilst I understand the objector's reference to the 'spirit of sustainability', it is important that the Scheme is assessed in the light of the statutory duties and definitions contained in the WFG Act.

2. Section 2 of the WFG Act defines sustainable development as:

'the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals.'

3. Section 3(1) of the WFG Act requires each public body is to carry out sustainable development and Section 5(1) defines "doing something in accordance with the sustainable development principle" as acting:

'in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs.'

4. This definition recognises that development must take place in the present day to satisfy the needs of today's society, but that the form of that development should not preclude choices for future generations. Section 5(2) sets out five ways of working that a public body must take account of in order to act in accordance with the sustainable development principle, which can be summarised as:
 1. Thinking long term
 2. Taking an integrated approach
 3. Involving a diversity of population
 4. Working in a collaborative way
 5. Understanding and prevention.
5. Sections 2 and 3 of the WFG Act together stipulate that each public body must, first, take action in accordance with the sustainable development principle and, second, that such action must be aimed at achieving the well-being goals defined in Section 4 of the Act. The tests to determine whether development is sustainable are therefore two-fold. First, has action been taken in accordance with the sustainable development principle and, second, does that action contribute to achievement of the well-being goals?
6. In paragraphs 33-44 of my proof (WG 1.23.1) I have analysed the Welsh Government's actions leading to its decision to adopt the Plan for the M4 Corridor around Newport and found that these did accord with the sustainable development principle. This should come as no surprise bearing in mind the duty imposed on Welsh Ministers by the Government of Wales Act 2006. In paras 56-216 of my proof I assess the Scheme against the well-being goals of the WFG Act and the sustainability objectives in PPW. In paragraphs 213-5 I summarise how the new section of motorway would contribute to achievement of the sustainability objectives in PPW and hence contribute to the well-being goals of the WFG Act.

7. The evidence presented to the inquiry is not based solely on cost benefit analysis but covers all aspects of the Scheme and identifies all impacts. PPW para 7.2.2 emphasises the need for economic benefits to be given equal consideration with social and environmental issues. The evidence presented by the Welsh Government clearly identifies the long term environmental effects of the Scheme and I acknowledge this in my proof, but this does not mean that such development must be rejected out of hand. The WFG Act requires action to be taken to ensure the needs of the present are met: there is a pressing need to take action now to address the problems associated with the M4 around Newport.
 8. A balanced judgement is required to decide whether taking action as proposed and constructing the new section of motorway would preclude choices for future generations.
 9. In paragraphs 244-249 of my proof of evidence I have weighed all the evidence relating to economic, social, environmental and cultural issues in order to reach a balanced conclusion on the merits of the Scheme. I conclude that the benefits the Scheme would bring to meet the needs of the present provide a compelling case in its favour. The Scheme is in accordance with the Welsh Government's duties under the WFG Act, it has been developed in accordance with the sustainable development principle, and it would contribute to achievement of the well-being goals.
- 2.5.2. I confirm that the statement of truth and professional obligations to the inquiry from my main proof still applies.

2.6. Tim Chapman (Carbon)

- 2.6.1. Response to **Point 19** (Suggests that from 2038 onwards, the 'do something' scenario produces more carbon emissions than the 'do minimum' alternative and this scheme is ultimately more climate-damaging than the 'do minimum' alternative. The carbon report assumes either expenditure of up to £2.3 billion, in order to achieve 'negligible' change in carbon emissions, or zero expenditure. An increase in climate change emissions" will result "from increased traffic, which would over time undermine the benefit of individual cars having reduced emissions per mile. But even if one accepted the Welsh Government's figures, the carbon reduction would only amount to 0.2% in 2022 and 0.4% in 2037):

1. The Carbon Report (Document 2.3.2, Vol.3, Appendix 2.4) and my main Proof of Evidence (WG 1.13.1) described in detail that the implication of the new Scheme is achieving carbon neutrality compared to the Do Minimum scenario, where carbon emissions would otherwise continue to worsen. The improvement results from the shorter route for the new road, the relief of congestion and significant reduction of disruptive incidents relative to the Do Minimum scenario. My assessment was based on the extensive traffic modelling presented in Mr Whittaker's Evidence, which accounted for, amongst other things, the impact from the toll changes.
 2. My assessment concluded that the introduction of the new Scheme should not hinder the efforts of the Welsh Government in achieving the climate change targets.
 3. My evidence shows that the emissions will not increase as a result of the Scheme, while at the same time the emissions per mile travelled will reduce.
 4. Mr Kells has reached his conclusions about the Scheme and carbon impacts based on Table 1 from my evidence, which is based on SATURN results, whereas he would better rely on Table 2 which is based on VISSIM/PHEM for carbon savings along the route. Table 1 from which he references provides savings of 0.2% for 2022 and 0.4% in 2037 – rather than 1% and 3% in the more appropriate Table 2. Mr Kells has based his extrapolation to 2038 on the SATURN traffic modelling results presented in Carbon Report of the Environmental Statement.
 5. These have been superseded by the more up-to-date Tempro 7.1 traffic model with updated VISSIM / PHEM analyses. These show now that the improvement diverges at an increasing rate with the calculations for 2037 showing that DS is some 3% better than DM for CO₂e emissions. Furthermore, as outlined in Sections 2.3 and 2.4 of the Carbon Clarifications (WG1.13.5), there is also an overall carbon improvement on the wider network (excluding the core network) due to the Scheme, suggesting that the overall improvement is even better than the models compute.
- 2.6.2. I confirm that the statement of truth and professional obligations to the inquiry from my main proof still applies.

2.7. Jon Davies (Ecology)

2.7.1. Response to **Point 20** (Suggests scientific evidence exists that the proximity of traffic to habitats has a deleterious effect on wildlife but the Environmental Statement casually disregards the impact of the new motorway on some existing Sites of Nature Conservation Interest):

1. The March 2016 ES (Document 2.3.2) does not discount the effects of disturbance from the operational road on wildlife. There are detailed considerations of the potential effects of noise in particular on the species considered to be most sensitive. Thus there are detailed assessments of the potential effects of construction noise on migratory, estuarine and freshwater fish, breeding birds and wintering birds. Similarly for operational noise from the road there is detailed consideration of the potential effects on breeding and wintering birds.
2. There can be no effects of noise on sites per se, only on the species using the site. However, the March 2016 ES recognises at 10.9.11 that there are SINC's within 1 km of the new section of motorway which could be subject to an increase in noise as a result of the operation of the new section of motorway. A number of these are already close to the existing M4, A48(M) or M48, or are located within urban areas, and it is unlikely that the operation of the new section of motorway would result in additional disturbance at these sites.
3. However, there are a number which are not currently near any major roads. These are, from west to east, LG Duffryn Site 1 (South Lake Drive) SINC, LG Duffryn Site 2 SINC, Alpha Steel Site SINC, Elver Pill Reen Grassland and Pond SINC, Greenmoor Pool SINC, Upper Cottage Pond SINC, Blue House Farm SINC and Blackwall Lane Field SINC.
4. Thus the ES recognised that there were SINC's where wildlife could be subject to additional disturbance as a result of the operation of the new section of motorway.

2.7.2. Response to **Point 21** (Concerned that otters are, according to Transport Scotland: “likely to suffer disturbance from traffic noise as well as from road lighting during the operational phase”. However, in relation to otters, the Welsh Government has concluded that the new road is not considered to be of concern with regard to noise or vibration disturbance, should otters choose to use the area during the operational phase. The approach to assessment is fundamentally flawed and fails to follow good practice already established by both Transport Scotland and the English Department for Transport):

1. The noise modelling and assessment follows the methodology contained within Highways England’s Volume 11, Section 3, Part 7 HD 213/11 - Rev 1, Noise and Vibration of the Design Manual for Roads and Bridges and the Welsh Office/Department for Transport (DfT) memorandum Calculation of Road Traffic Noise. The methodology is therefore fully compliant with national guidance and standards for road traffic noise modelling and assessment in the UK including Wales. This methodology has been applied to hundreds of road schemes across the UK and tested at many Public Inquiries.
2. In section 10.9 of Chapter 10 of the March 2016 ES (Document 2.3.2), under the operational phase, the following impacts are considered: severance/fragmentation of habitat or corridors; effects of highway drainage; potential for pollution events from collision/other traffic incidents on the new road; salt accumulation from de-icing operations; lighting; and potential ecological benefits of new landscape provision and management. Disturbance from noise or vibration is considered specifically with regard to the potential impact on the holt site at the landfill site (paragraph 10.9.128).
3. Despite the extensive mitigation measures proposed, the likely effect of the Scheme during the operational phase is assessed as Minor Adverse (and the significance of effects Slight or Moderate), and this is largely due to the long-term disturbance effects of a new road in a previously undisturbed area.

4. No confirmed otter breeding sites have been recorded within the survey area to date. However, further surveys of potential holt and resting sites are to be undertaken in 2017-18 (up to 4 visits per holt/resting site) to inform the otter method statement and any NRW licence for otters, should one be required. Pre-construction surveys would also be undertaken to take account of any changes in baseline conditions. Should a confirmed breeding site be found adjacent to the Scheme, the potential certainly would exist for disturbance. However, the mitigation for this would be to create alternative provision nearby in a less disturbed location. Should the otter(s) using the breeding site not become habituated to the noise of the road, an alternative breeding area will be available.
5. As the otter population continues to recover, otters are increasingly found in urban areas as a result of improved water quality and the return of fish stocks to rivers showing their ability to adapt to such environments. The continuing problem of otter road casualties shows that they do not avoid roads. The Scheme has been designed in accordance with good practice with culverts and mammal crossings to allow otters to move across the line of the road, and fencing to prevent them accessing the carriageway.
6. Finally, it should also be noted that in a paper by Sarah Bassett and Jules Wynn, published in CIEEM's journal *In Practice* in December 2010, it was concluded, on the basis of considerable experience with otters and development sites, that otters 'often continue to use resting sites and watercourses throughout the duration of the works, even works involving major excavations and over a long period of time', and that 'at worst, the effects of disturbance were minimal and not significant and, at best, that otters were not disturbed'.
7. The level of disturbance during construction is likely to be greater than during the operational phase, as the noise, visual and lighting elements (when close to a resting site) are more localised and intense, so it can be assumed that disturbance during the operational phase is even less likely to be significant. And as also noted in the paper, 'there is no evidence to suggest that otters actively avoid areas of human activity, either when foraging or resting'.

2.8. Philip Evans (Noise)

2.8.1. Response to **Point 22** (Suggests the Welsh Government's approach of allocating 'medium' noise sensitivity to residential receptors is unique and unwarranted when the Planning Inspectorate, Highways Agency and Transport Scotland routinely classify residential receptors as being of 'high' sensitivity to noise):

1. Residential receptors are considered to be of medium sensitivity. Consequently, a major magnitude of impact equates to a moderate or large significance of effect; a moderate magnitude of impact equates to a moderate significance of effect; a minor magnitude of impact equates to a slight significance of effect; a negligible magnitude of impact equates to a neutral or slight significance of effect; and no change equates to neutral significance. It is considered that this categorisation most appropriately allows residences to be assessed, whilst also allowing for identification and assessment of more-highly sensitive uses.

2.8.2. Response to **Point 23** (Concerned that the Welsh Government concludes in the 'do minimum' scenario that a total of 38 residential properties would experience a minor increase in noise by 2037 with 20,628 properties experiencing either no impact or negligible impact, and with the scheme 1,203 receptors suffer a significant increase in noise):

1. We suspect that Friends of the Earth Cymru has compared dissimilar scenarios. Considering the 2022OYDM > 2037FYDS without and with mitigation, significant noise increases at 2,015 properties without mitigation (para 1.3.14) and at 1,265 properties with mitigation (para 1.5.9). This demonstrates the efficacy of the proposed barriers in removing 37% of the significant adverse long term noise effects.

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

2.9. Michael Bull (Air Quality)

2.9.1. Response to **Points 24, 25 and 26** (Suggests the Scheme is unnecessary for the purpose of meeting air quality standards. Under the 'do minimum' scenario, air pollution is within legal limits at all human receptors by the defined opening year of the new highway. Air pollution is an ongoing problem in Newport – but it is largely unrelated to the existing M4), (Concerned that the Welsh Government makes great play of a reduction in NO_x emissions as a result of the scheme. However, there will be a very significant reduction in regional emissions in the absence of the scheme: from 1,136 tonnes/year in 2014 to 599 tonnes/year in 2022 (a 47% reduction). The total benefit from the scheme in the opening year (a reduction of 190 tonnes of NO_x in total, when compared to the 'do minimum' option), is equivalent to 0.8% of Welsh transport emissions – or “not significant” in Welsh Government terms) and (Concerned that Air Quality Management Areas along the M4 in Newport cover a grand total of 8 residential properties and in every case, air quality is modelled to be superior to required standards in both 2022 and 2037 under the 'do minimum' scenario. Of every household monitored that stands to receive moderate or major benefit as a result of reduced air pollution from the proposed development, the 'do minimum' scenario would lead to better air quality in 2022 and 2037 than current (2014) air quality in every single case):

1. It is welcomed that Friends of the Earth Cymru recognise that emissions controls will bring about improvements in air quality with or without the scheme. However, the scheme results in a reduced exposure to air pollutants as detailed in Para 3.3.8 and Table 8 of the proof of evidence WG1.12.
2. The scheme also results in air quality improvements in central Newport as well as near to the current M4 corridor - see Table 7 and Table 8 of the proof of evidence (WG1.12.1).
3. Full details of the impacts on the AQMAs are detailed in Para 3.3.7 of WG1.12.1, and Tables 8 and 12. However, the impacts of the scheme are much more wide ranging than just in the AQMAs as shown in Table 7 of the proof. Objective 8 for the scheme is "Improved air quality in areas next to the M4 around Newport" not just for the AQMAs.

4. The scheme results in an overall reduced exposure to air pollutants which is considered to be a beneficial impact from the proposed scheme.
5. The reduction in pollutant concentrations with or without the scheme demonstrates the very significant success of the measures being taken to reduce emissions of air pollutants. The scheme however, results in further reductions in pollutant that wouldn't be achieved otherwise.
6. Whilst the percentage reduction in total local pollutant emissions appears to be small, there are very few other measures that could be implemented that would result in a similar level of reduction. It is assumed that FoE would welcome any reduction in pollutant emissions.

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

2.10. Paul Canning (Tidal Flooding)

2.10.1. Response to **Point 27** (Suggests the potential impact of climate change on sea level rise is being ignored and serious questions must be asked as to whether or not the proposal is genuinely future-proofed for climate change, particularly in the light of recent studies suggesting both that sea level rise is taking place at a rate significantly more rapid than previously thought likely, and that sea level rise of a scale of metres is possible this century. The approach taken by the Welsh Government is particularly surprising because elsewhere it appears to recognise the threat caused by climate change to infrastructure: "From the results, the potentially most significant risks for Wales from climate change to the water environment appear to be... increases in flooding on the coast and inland, affecting people, property and infrastructure):

1. This objection is stated in their September 2016 submission to the Inquiry, paragraphs 166-168. I note in WG1.16.1 paragraphs 4.7-4.10 and Table 2 that previous studies have assessed (especially the SEFRMS) a wide range of climate change scenarios based on EA (2011) and UKCP09 which is a UK specific application of the IPCC AR4 work, covering 0.39-1.72m of sea level rise over the next 100yrs. WG1.16.1 paragraph 4.14 further notes that the SEFRMS recommendations for 0.1%AEP SoP are robust across all these scenarios. These scenarios include the formally

defined sea level rise amounts relevant to TAN15, noted in WG (2016), being approximately 1m over the next 100yrs.

2. I note the quote is from the September 2016 Environmental Statement Supplement (Document 2.4.4) Vol 1 Chapter 16 at 16.4.98. Paragraphs 16.4.99-100 note that the draft SEFRMS is being applied as a technical document, recommending a 0.1%AEP SoP into the future.

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

2.11. Richard Graham (Water Quality)

2.11.1. Response to **Point 28** (Considers that the River Ebbw is already exceeding Water Framework Directive (WFD) limits including oil and grease, copper, zinc and Phenol odour):

1. The proposed scheme does not discharge highway drainage to any WFD waterbodies designated for the Ebbw Fawr, the closest being river waterbody GB10905602691 (Ebbw R – confluence Ebbw Fach R to Maes-glas) situated approximately 500m upstream of the proposed alignment. Although the proposed alignment crosses the downstream end of the River Ebbw, near its confluence with the River Usk, the Ebbw east and west outfalls discharge to the Usk Transitional and Coastal (TraC) WFD waterbody (GB530905415404).
2. Although situated upstream of the proposed alignment, the NRW status for specific pollutants and physio-chemical elements (in both the 2009 and 2015 cycles) for the Ebbw Fawr WFD River Waterbody GB10905602691 (Ebbw R – confluence Ebbw Fach R to Maes-glas) is classified as being high, although the overall ecological potential is considered to be moderate. The chemical status of this waterbody does fail on the basis of priority hazardous substances (PHS), specifically benzo(ghi)perylene and indeno(123-cd)pyrene in the 2009 cycle and tributyltin compounds in the 2015 cycle. The latter PHS is not associated with highway drainage. Taken as whole the chemical condition of the Ebbw Fawr WFD River Waterbody GB10905602691 as presented by NRW is not consistent with chronic pollution or impact by highway drainage.

3. Friends of the Earth Cymru consider that NRW monitoring data for the Ebbw Fawr monitoring point below Cardiff Road Bridge already shows “WFD exceedances of limit values” indicative of pollution by traffic.
However it should be noted that:
 4. This conclusion is not consistent with WFD status for the Ebbw Fawr or Usk TraC presented by the NRW and described above and in Point 4 below.
 5. Phenol odours are not a pollutant associated with highway runoff.
 6. Friends of the Earth Cymru do not state what WFD “limits” they have used to reach their conclusions, hence their assessment cannot be corroborated. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 (herein after referred to as the 2015 Directions) provide a summary of NRW supported Environmental Quality Standards (EQS) used for the purpose of the WFD assessment.
 7. As the River Ebbw at the Cardiff Road crossing and downstream thereof will be characterised by high (albeit variable) salinity, non-freshwater EQS must be used. It is not clear whether these have been applied.
 8. The 2015 Directions do not provide a limit for “oils & grease” or “Phenol Odours”, furthermore the NRW dataset provided does not confirm detection for either parameter.
 9. The salt water EQS for heavy metals presented in the 2015 Directions relate to dissolved concentrations and cannot be applied to the total concentrations for zinc presented in the NRW dataset.
 10. The salt water EQS for copper and zinc presented in the 2015 Directions are for long-term means with no short-term limits (i.e. MACs) presented. As such these standards should only be applied to mean data for the water body as opposed to the screening of individual spot measurement results.
 11. The EQS for copper presented in the 2015 Directions is dependent on the DOC concentration in the water body. There is no indication whether Friends of the Earth Cymru have undertaken the necessary calculation.

12. NRW classify the Usk TraC waterbody (GB530905415404) to which the Ebbw east and west outfalls discharge as having good status with respect to chemical quality. The Usk TraC is classified as having a moderate ecological status, although this does not relate to either specific pollutants or physio-chemical elements which are both assigned the highest status class of high. Specific pollutants include copper and zinc, metals commonly associated with highway drainage.
13. In summary, Friends of the Earth Cymru's contention that baseline water quality in the Ebbw "already has a road-related water pollution problem" and fails against WFD water quality criteria is not justified for the scheme in the vicinity of the crossing at the lower reaches of Ebbw that form part of the Usk TraC WFD waterbody on the basis of the NRW dataset presented and the NRW WFD designation of these waterbodies.

2.11.2. Response to **Point 29** (Suggests there has been insufficient assessment of impacts to the River Ebbw and that it is critical that the Welsh Government re-assesses the construction and operational impacts of the new motorway on the portion of the River Ebbw directly intersecting with it. A plan must also be put in place to dispose of reed bed cuttings in the runoff ponds as contaminated waste because of the high level of contamination likely to be absorbed):

1. The Usk TraC WFD Waterbody (GB530905415404) includes the mouth of the River Ebbw up to the A48. The first WFD waterbody designated on the Ebbw is the Ebbw R - conf Ebbw Fach R to Maes-glas (GB109056026910), which extends to the Usk Trac in the proximity of the A48. For the purpose of the WFD assessment, the WFD water body for the Ebbw is not directly intersected by the highway as stated in Table 1 of the Water Framework Directive Compliance Assessment forming Appendix 16.4 to the March 2016 ES (Document 2.3.2).
2. An assessment of possible effects on water quality associated with discharges to the Ebbw and Usk was undertaken using the HAWRAT tool, as presented in Appendix 16.3 of the ES (Document 2.3.2). The proposed discharges to the River Ebbw and River Usk passed the tests for dissolved phase and sediment bound pollutants, without consideration of the effect of mixing / dilution by tidal inundation. On this basis it was

concluded that daily pollutant loads associated with these discharges are “insignificant following mixing with diurnal tidal volumes” and hence the impact from these discharges were considered to have “negligible magnitude of impact and neutral significance of effect”.

3. Unlike the low-flow freshwater system of the Gwent Levels, the predicted effect of pollutants associated with highway runoff (both dissolved and/or sediments) are so small in such a dynamic, tidally inundated, estuarine environment that they do not drive a need for ongoing future compliance monitoring.
4. NRW have expressed their acceptance of the proposed measures.

2.11.3. Response to **Point 30** (Considers minimal mitigation is proposed and suggests the monitoring proposed of 12 months’ duration “to demonstrate acceptable quality of the water treatment area discharges” is not acceptable, since traffic volumes are predicted to increase through 2037):

1. The pollution control measures proposed for the River Ebbw meets those required by the DMRB for outfalls to coastal waters that pass the required DMRB risk assessment for effects of routine runoff on surface waters and pollution impacts from accidental spillages.
2. The lower level of pollution control proposed for the River Ebbw west and east outfalls relative to the Usk outfall reflect the lower environmental sensitivity and designation of the watercourse at the point of discharge. The boundary of the Severn Estuary / River Usk SAC, Severn Estuary SPA and Severn Estuary SSSI is situated approximately 500m south (downstream) of the proposed Ebbw crossing
3. The proposed mitigation for the River Ebbw has been approved by NRW, as stated in their response to the Draft Orders concerning the proposed M4 corridor around Newport dated 4 May 2016, paragraph 16.5.8. NRW stated that they “are satisfied that discharges to the Rivers Usk and Ebbw have lesser requirements for attenuation and treatment and, provided these requirements are adequately covered to our satisfaction within the Statement of Commitments, we advise that that the proposals presented into these tidal waters are adequate”. As contained in the Register of Commitments Ref. 4 “attenuation ponds will ensure surface water runoff

will meet the WFD and SSSI requirements". This highlights regulatory acceptance with the measures proposed for the Ebbw and Usk.

4. The provision of WTA inspection and maintenance is included with the Commitments Register and will be detailed within an Inspection and Maintenance Schedule (based on the suggested requirements given in the DMRB) to be produced and available at the opening of the new motorway, currently being agreed with NRW and Welsh Government. The will include requirements for inspection, replacement and appropriate disposal of reed bed planting.
5. Of note, the following commitments (December 2016 ESS: Appendix SR18.1 – Register of Commitments) will ensure maintenance of the treatment areas and reens and also mitigation of pollution events: 4, 5, 9, 89, 90, 91, 92, 93, 97, 98, 157, 158, 159, 160, 161.
6. Currently being reviewed by NRW is a Monitoring Protocol for a minimum period of 5 years of monthly, chemical and biological water quality monitoring of points upstream and downstream of each WTA and monitoring of the discharge point outfall. Sediment quality monitoring is also proposed on an annual basis at the discharge point and the outfall.
7. Should chemical analysis undertaken on treated surface water indicate that water quality data is showing early signs of an unexpected rising trend (but still below the set NRW trigger levels) actions would be undertaken immediately to address this, e.g. undertake investigations to identify and remedy potentially sub-standard WTA functionality before trigger levels are breached that would indicate pollution was occurring.

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