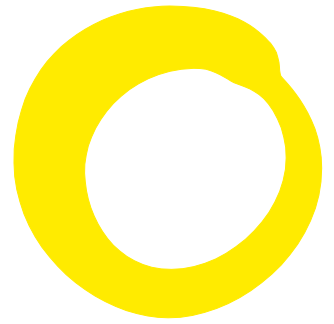


May 2016

Submission to the Welsh Government

in response to the M4

Draft Orders, environmental statement and associated reporting



**cyfeillion
y ddaear
cymru**
**friends of
the earth
cymru**

Summary

We contest the Draft Orders for the following reasons:

- The 'need' argument is based on flawed Transport Planning Objectives dating from 2007 which have been substantially unrevised since that date (and therefore fail to take into account latest knowledge).
- It has been and remains the view of Friends of the Earth Cymru that the Welsh Government's approach is deficient through failing 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). Considering these alternatives could have obviated the stated need for this development. The Welsh Government's approach thus runs counter to its own guidance.
- The Welsh Government appears to have failed to consider *at all* the direct water pollution impacts on the lower Ebbw River, even though this water body is currently failing under the Water Framework Directive chemical status parameters. Water treatment proposed on the discharge (oil interceptors) is wholly inadequate to deal with the water pollution arising from 30,000 vehicle movements per day.
- The proposed development is shown by the developer to be 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.
- The Welsh Government's approach of allocating 'medium' noise sensitivity to residential receptors is unique and unwarranted: the Highways Agency and Transport Scotland routinely classify residential receptors as being of 'high' sensitivity to noise.
- In the 'do minimum' scenario, a total of 38 residential properties experience a minor increase in noise by 2037. However, with the scheme, a total of 1,203 receptors experience a significant increase in noise (of up to 18 dB).
- The Welsh Government's approach to noise impacts on ecological receptors raises serious concerns of procedural irregularity, and is in stark contrast to that adopted by the Highways Agency in England.
- The Welsh Government appears to ignore the potential impact of climate change-induced sea level rise on the new motorway. Its approach to carbon accounting is fundamentally flawed.
- The economic appraisal is not fit for purpose and needs to be re-drafted.
- The sustainable development report is not fit for purpose and needs to be re-drafted. To conclude that the proposed development is sustainable (principally on the basis of economic benefit) is contrary to the word and spirit of sustainability.
- The transport forecast is flawed and should be re-drafted. We note that for the year 2014, the Welsh Government's forecast for traffic is already out by 2.5%. The net result of £2.3 billion of expenditure is that at peak hours, just under 3,000 or so people using the black route will save 9 minutes of travel time or less.

Overview

1. The Welsh Government brushes aside any conception that there is no need for a new motorway with one sentence:
“The transport related problems on the M4 around Newport are well established and proposed measures aiming to address the problems have been developed and assessed over a period of more than 25 years”¹.
2. However, Friends of the Earth Cymru has consistently challenged this assumption; our arguments have not apparently been rebutted by Welsh Government.
3. A fuller treatise of some of our historical concerns with the ‘need’ argument is appended at Appendix 1.

Chronology

4. 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”².
5. 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.

Transport Planning Objectives

6. One of our principal concerns is that the ‘problems’ and ‘objectives’ to be tackled by the proposed development date from 2007 and have not been substantively revisited⁴. The fact that they have not changed⁵ is indicative of the Welsh Government’s refusal to recognise the changing context of transport.
7. The Welsh Government notes:

¹ <http://gov.wales/docs/det/policy/160310-m4-es-c4-development-alternatives.pdf> 4.3.1

² <http://gov.wales/docs/det/policy/160310-m4-es-c4-development-alternatives.pdf> 4.3.19

³ <http://gov.wales/docs/det/publications/100329ntpen.pdf>

⁴ Notwithstanding the Welsh Government’s contention that “In developing the Transport Planning Objectives for this appraisal, the Welsh Government considered and reviewed the problems and objectives identified in earlier work. It was confirmed that the problems remained” and “As a part of this appraisal the Transport Planning Objectives agreed during earlier consultation and engagement exercises were again reviewed. It was considered that the objectives previously considered remained wholly relevant to the M4 around Newport and no changes were made to them” These reviews could not have been thorough or they would not have come to the conclusion that the problems were as they were in 2007 (see, for example, the ‘safety’ argument).

⁵ <http://gov.wales/docs/det/policy/160310-m4-es-c4-development-alternatives.pdf> 4.3.43

“The Welsh Government, with the help of others, identified 15 goals for the M4 CEM Programme. These goals aim to address the identified transport related problems listed in section 3.2. For clarity goals are referred to as “Transport Planning Objectives” (TPOs) in WeITAG (see Glossary). The 15 goals (listed below) provide a framework in which to appraise the relative performance at a strategic level of the draft Plan, the reasonable alternatives and the Do Minimum scenario”⁶.

8. It is important to note that Welsh Government guidance considers it a relevant consideration that: *“Each objective is genuinely needed and does not duplicate or overlap with other objectives”⁷.*
9. The Transport Planning Objectives are listed below, along with our assessment of if they are genuinely needed or if they duplicate or overlap with other objectives. We submitted this table as part of our response to the Welsh Government consultation WG 19741 in December 2013.

Objective	Genuinely needed?
1. Safer, easier and more reliable travel east-west in South Wales.	Overlap or duplication with objectives 2, 5, 7 and 13
2. Improved transport connections within Wales and to England, the Republic of Ireland and the rest of Europe on all modes on the international transport network.	Total duplication with objective 1. By definition, if transport connections are made more reliable east-west in south Wales, the connections within Wales and internationally will be improved
3. More effective and integrated use of alternatives to the M4, including other parts of the transport network and other modes of transport for local and strategic journeys around Newport	Overlap with objective 4 (local road network and other transport)
4. Best possible use of the existing M4, local road network and other transport networks	Total overlap with objectives 3 (local road network and other transport) and 5 (existing M4)
5. More reliable journey times along the M4 Corridor	Total overlap with objective 1 (more reliable journey times)
6. Increased level of choice for all people making journeys within the transport Corridor by all modes between Magor and Castleton, commensurate with demand for alternatives	This objective seems unclear. Increased choice of modes? Increased frequency of trains/buses? Increased development of cycling infrastructure?
7. Improved safety on the M4 Corridor between Magor and Castleton.	
8. Improved air quality in areas next to the M4 around Newport	Should be expanded to simply “improved air quality”. Seems to exclude air quality around new road infrastructure.
9. Reduced disturbance to people from high noise levels, from all transport modes and traffic within the M4 Corridor	

⁶ <http://m4newport.com/assets/issue-m4-sea-environment-report---publication---c2.pdf> page 11

⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf page 67

10. Reduced greenhouse gas emissions per vehicle and/or person kilometre.	False objective. The objective should be an absolute reduction in greenhouse gas emissions.
11. Improved travel experience into South Wales along the M4 Corridor.	What does 'travel experience' entail? Spurious and unnecessary.
12. An M4 attractive for strategic journeys that discourages local traffic use.	Some overlap with objective 4
13. Improved traffic management in and around Newport on the M4 Corridor.	Overlap with objective 1
14. Easier access to local key services and residential and commercial centres.	
15. A cultural shift in travel behaviour towards more sustainable choices.	

10. Friends of the Earth Cymru considers 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.
11. This overlap means that by providing a high score for one element (more reliable travel, for example), this score is magnified beyond all logical or rational degree. Reliable travel is elevated several-fold more important than greenhouse gas emissions, for example.

Reasonable alternatives

12. Friends of the Earth Cymru is concerned that the Welsh Government never genuinely explored a package of different measures. The information below was largely submitted to the Welsh Government in our response to the Welsh Government consultation WG 19741 in December 2013.
13. This is despite the Welsh Government guidance that:
“up the hierarchy’ thinking could suggest a wider, and more sustainable, range of alternatives than hitherto considered. Stakeholders may usefully be involved in the generation and assessment of both strategic and more detailed alternatives through consultation. Demonstrating that there are choices to be made is an effective way of engaging stakeholders in the process. The alternatives considered throughout the process must be documented and reasons given on why they are or are not taken forward”⁸.
14. The Welsh Government’s public transport assessment demonstrated that up to 3% traffic reductions could be realized on the M4 around Newport with a set of public transport improvement measures with a capital cost of £300 million⁹.
15. The Welsh Government has also concluded that electrification of the southern Wales mainline and the introduction of the Metro¹⁰ would have a reductive effect of up to 3%¹¹.

⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf page 69

⁹ <http://www.m4cem.com/downloads/reports/Issue%20Public%20Transport%20Overview%2012.03.12%20revised.pdf>

¹⁰ <http://www.walesonline.co.uk/business/business-news/edwina-hart-gives-backing-south-6225251>

16. The Welsh Government also showed that encouraging greater use of public transport by local residents could reduce M4 traffic by up to 5% (although it chose to demonstrate this by using a somewhat ambitious 100% increase in public transport use).
17. The Welsh Government also conceded that there exists:
*“Uncertainty as to the success in achieving behavioural changes to result in a modal shift to more sustainable modes of travel”*¹².
18. The Welsh Government has shown that the *partial* closure of just one motorway junction could result in a 5% reduction in peak traffic through the Brynglas Tunnels (widely regarded as the most restricted point on the M4 around Newport)¹³.
19. Alternative options that relate to ‘common measures’, ‘public transport measures’ and ‘junction closures’ – particularly in combination – should have been considered but have never received comparable treatment with highway interventions.
20. This is despite these measures – public transport investment and partial closure of one motorway junction – being able to reduce traffic through the Newport area by as much as 16% (as per the combined impact of the above interventions).
21. The Welsh Government also states that in the ‘do minimum’ scenario, 13% of the traffic on the motorway would be both joining and leaving the M4 between junctions 23 and 29, with a further 36% either leaving or joining during this stretch¹⁴. There is undoubtedly a portion of this traffic that could be averted through improvements in public transport.
22. The Welsh Government has thereby foreclosed any alternatives that are not either motorways south of Newport, or ‘do minimum’. In reality the infrastructure alternatives selected are so similar as to be analogous. 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.
23. The Welsh Government’s more detailed reasoning for selecting the alternatives was not open to consultation even though its conclusions¹⁵ are based on a highly subjective set of assumptions related to performance of the options appraised, against a suite of transport planning objectives which were themselves not open to consultation.
24. It has been and remains the view of Friends of the Earth Cymru that the project is deficient through failing to consider reasonable alternatives (including the ‘Blue Route’ via the Llanwern steelworks

¹¹ <http://gov.wales/docs/det/policy/160310-m4-es-c4-development-alternatives.pdf> 4.3.46

¹² <http://m4newport.com/assets/issue-m4-sea-environment-report---publication---c2.pdf> page 95

¹³ <http://www.m4cem.com/downloads/reports/M4%20CEM%20Stakeholder%20Workbook.pdf> page 33

¹⁴ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 9.5.1

¹⁵

[http://www.m4cem.com/downloads/reports/Issue%20M4%20Corridor%20Around%20Newport%20WeITAG%20Appraisal%20Report%20Stage%201%20\(Strategic%20Level\).pdf](http://www.m4cem.com/downloads/reports/Issue%20M4%20Corridor%20Around%20Newport%20WeITAG%20Appraisal%20Report%20Stage%201%20(Strategic%20Level).pdf) pages 49-75

road, and alternatives relating to ‘common/complementary measures’, ‘public transport measures’, ‘junction closures’, and these measures in combination)

25. The Welsh Government’s reasoning¹⁶ for not progressing with the ‘do minimum’ scenario is fundamentally flawed (see Table).

Welsh Government’s concerns	Our response
Existing problems relating to congestion and capacity on the M4 around Newport would deteriorate further, with flows predicted to exceed 100% of capacity in the future	Welsh Government has no means of measuring congestion. Lack of detail on when capacity would be exceeded. Given Welsh Government’s forecasts, we might expect many roads in Wales to need a relief road to run in parallel. Approach runs counter to ‘hierarchy of alternatives’ (see Appendix 1)
The existing M4 Corridor around Newport has safety issues in some sections, including alignments that fall below current motorway standards, a lack of hard shoulder, frequent junctions and accidents resulting from stop-start conditions. The ‘Do-Minimum’ scenario results in a range of issues relating to resilience on the M4 Corridor around Newport due to reduced ability of the transport network to respond to incidents, including accidents and other causes of delays.	The existing M4 around Newport is safer than the UK average. We wrote the following in our December 2013 consultation response: “No evidence is provided that the M4 around Newport is unsafe, although the consultation document tries to infer that to be the case. This is despite our previous consultation response that pointed out: ‘The Welsh Government’s consultants have kindly provided Friends of the Earth Cymru with crash data from 2009 and 2010. These reveal that there were substantially fewer crashes in 2009 and 2010 than in any other year for which information is available (i.e. from 2002 to 2008)... Using the most recent crash statistics we have shown that the junctions under examination are substantially safer than the UK motorway average, and in some cases stunningly so. This is partially conceded in the Appendix to the consultation document. The safety case is therefore unproven” The Welsh Government’s use of crash data going back up to a decade is cause for concern ¹⁷ .
Congestion is considered a barrier to economic growth, affecting business performance and the wider economy. Congestion also results in higher journey times for commuters, reducing the effective travel to work area. Therefore, increasing congestion resulting from capacity and resilience problems mean that it performs poorly against economic	The Welsh Government has no means of measuring congestion: “There is no absolute measure of ‘congestion’” ¹⁸ . The best the Welsh Government can come up with is that the ‘do minimum’ scenario “could pose a constraint to the economy of South Wales”. Equally, multi-billion pound expenditure on one unnecessary scheme could pose a constraint to the economy of South Wales.

¹⁶ <http://gov.wales/docs/det/policy/160310-m4-es-c4-development-alternatives.pdf> 4.3.82 and Table 4.1

¹⁷ <http://www.foe.cymru/cy/m4-safety-stats>

¹⁸ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 9.4.2

criteria and could pose a constraint to the economy of South Wales.	
The option would not address existing noise and air quality concerns along the M4 (including existing Air Quality Management Areas). Higher traffic volumes on the M4 would contribute to poor air quality and to noise.	Noise: 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. With the scheme, 1,203 receptors suffer a significant increase in noise. Air Quality Management Areas along the M4 in Newport cover a grand total of 8 residential properties. In every case, air quality is modelled to be superior to required standards in both 2022 and 2037 under the 'do minimum' scenario
There would be reduced resilience on the existing M4 due to increased traffic growth. This means that there would be a reduced ability of the transport network to respond to incidents, including accidents and other causes of delays.	If – as Welsh Government contends – traffic is on an inexorable upwards trend, then the same holds true for every road in Wales.

26. The objective of the SEA Directive is:

“to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development”¹⁹.

27. The Welsh Government’s actions undermine this 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.

Water pollution

28. A number of pollutants are common from road traffic. We expect increased volumes of the following pollutants from increased road traffic: cadmium, chromium, copper, lead, mercury, nickel, oil and grease, PAHs and zinc²⁰.

29. We have received water chemical monitoring information from Natural Resources Wales covering the three year period 2013-2015.

30. The Ebbw Fawr below Cardiff Road Bridge demonstrates the problem with run-off from relatively busy roads. The exceedences of limit values over the three years 2013-2015 are as follows:

- Oil and grease (visible) – 12

¹⁹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32001L0042:EN:HTML>

²⁰ https://www.sepa.org.uk/media/163244/vehicle_metals_polycyclic_aromatic_hydrocarbons.pdf

- Copper (filtered) – 9
- Zinc (elemental) – 12
- Phenol odour – 12

31. This demonstrates that water pollution as a result of heavy metals and polyaromatic hydrocarbons – principally arising from vehicular pollution – is a notable problem where roads cross waterways.
32. Given these failures for a road that carries considerably fewer road movements than the proposed new motorway, it is difficult to see how the Welsh Government’s assessment concluded that *“all discharges to the affected surface water bodies are predicted to represent acceptable discharges... therefore, no further assessment of operational impacts resulting from the new section of motorway, in terms of routine highway run-off, on WFD water bodies is required”*²¹.
33. This is particularly the case because the Welsh Government is prepared to deploy only minimal mitigation for operational pollution into the River Ebbw:
*“Discharges to the Usk and Ebbw being tidal do not require flood compensation lagoons but will be provided with oil interceptors”*²².
34. It appears that the sole mitigation to the Ebbw for runoff from a motorway carrying 30,000 vehicles a day is oil interceptors.
35. The Water Framework Directive requires all water bodies to achieve good qualitative status by 2015, which includes a requirement for water bodies to be of good chemical quality. If one limit value is exceeded, good ecological status is unattainable.
36. Provision of oil interceptors alone is insufficient to secure no deterioration in water quality, or to protect compliance with the Water Framework Directive.
37. We furthermore raise the urgent concern that the report on compliance with the Water Framework Directive has erred and needs revision. Table 1 thereof lists the water bodies directly intersecting the new section of motorway²³. However, the River Ebbw is only mentioned as being indirectly affected (and then only upstream of Maes-Glas), even though by any standard there is a direct intersection.
38. We note that the indirectly affected portion of the Ebbw is currently failing to meet good chemical status (see above). However, no examination is provided by Welsh Government of the lower Ebbw, until its confluence with the Usk²⁴. Likewise, this stretch of river was not even considered from being screened in to the detailed assessment²⁵.
39. It is critical that the Welsh Government re-assess the construction and operational impacts of the new motorway on the portion of the River Ebbw directly intersecting with it.

²¹ <http://gov.wales/docs/det/policy/160310-m4-es-a16-4-water-framework-directive-compliance.pdf> 4.2.15

²² <http://gov.wales/docs/det/policy/160310-m4-es-c16-drainage-water-environment.pdf> 16.5.8 and 16.8.8

²³ <http://gov.wales/docs/det/policy/160310-m4-es-a16-4-water-framework-directive-compliance.pdf> 4.1.6

²⁴ <http://gov.wales/docs/det/policy/160310-m4-es-a16-4-water-framework-directive-compliance.pdf> 4.3.1

²⁵ <http://gov.wales/docs/det/policy/160310-m4-es-a16-4-water-framework-directive-compliance.pdf> 4.4

40. A plan must 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 absorbed²⁶.
41. The monitoring proposed of 12 months' duration *"to demonstrate acceptable quality of the water treatment area discharges"* does not appear to be acceptable, since traffic volumes are predicted to increase through 2037.

Air pollution – human receptors

42. By 2020, Defra predicts that in the *absence* of the proposed development, just one part of the South Wales air quality zone will be above the EU's 40µg/m³ limit value. That location is not substantively affected by the proposed development²⁷.
43. Welsh Government air pollution modelling shows that:
*"pollutant concentrations are below the annual mean NO₂ objective in the do-minimum scenario"*²⁸
44. In fact, in the 'do minimum' scenario, NO₂ pollution is below the mean 40µg/m³ threshold in all areas other than on the highway itself and within existing Air Quality Management Areas on roads leading to the centre of Newport²⁹.
45. The central Newport areas in excess of the pollution threshold are relatively unchanged under the 'do something' scenario.



"Do something"



"Do minimum"

46. Figure 7.12c demonstrates the change in this area to be a reduction of between 0.4 and 2µg/m³.

²⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291633/scho1209brnz-e-e.pdf p18

²⁷ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> 7.2.4

²⁸ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> 7.8.3

²⁹ Figure 7.12 Environmental Statement

47. Monitored air pollution is significantly greater than modelled air pollution³⁰. Corrections made (see Appendix 7.1, Diagrams 7.3, 7.4, 7.5, 7.6) don't appear to rectify these sufficiently, particularly in the most polluted (monitored) sites.

48. Appendix 7.2 demonstrates that air quality (NO₂) failures take place at the following locations (Table 1). Only two of these locations that exceed air quality standards are close to the M4, and only one of these is within an Air Quality Management Area (that designates protection for people), for one dwelling.

Location ³¹	Mean NO ₂ concentration (2014) (µg/m ³)	Current M4 proximity?	AQMA? ³²
Spytty Lane	40.0	No	No
Lamppost Badminton Road	46.6	Yes	No
M4 Junction 25 1	58		
M4 Junction 25 2	56		
High Street Caerleon	43	No	Yes
15 High Street Caerleon	54		
18 High Street Caerleon	49		
9 Castle Street Caerleon	40		
Montgomery Road	71	No	No
Montgomery Road 2	51		
48 Malpas Road	41	No	Yes
222 Corporation Road	42	No	No
Caerleon Road swift	40	No	Yes
Buckland College	43	Yes	Yes
148 Chepstow Road	46	No	Yes

49. This confirms that air pollution is a problem in urban areas in Newport and is largely unrelated to the M4.

50. Of every household monitored that stands to receive moderate or major benefit as a result of reduced air pollution from the proposed development, 'do minimum' scenario would lead to better air quality in 2022 and 2037 than current (2014) air quality in every single case³³.

51. In every case, the 'do minimum' scenario provides for air quality superior to air quality standards (annual NO₂ levels of 40µg/m³):

"In 2022, the opening year, no exceedences of any of the air quality objectives for NO₂ or PM₁₀ are predicted with or without the Scheme"³⁴.

³⁰ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> 7.3.74

³¹ M4 Corridor around Newport Environmental Statement Volume 3: Appendix 7.2 Air Quality Baseline Environment

³² <http://www.newport.gov.uk/en/Transport-Streets/Pollution-and-noise-control/Air-quality.aspx>

³³ M4 Corridor around Newport Environmental Statement: Volume 3 Appendix 7.3 Construction Traffic and Operational Assessment Table 7.3.4

³⁴ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> 7.8.22

52. Finally, the Welsh Government claims that:

“in 2022, without the Scheme in place, annual mean NO₂ concentrations along the existing M4 corridor would remain elevated and as such are at risk of exceeding the annual mean NO₂ objective, given the uncertainty in modelling”³⁵.

53. But it is abundantly clear from scrutiny of the maps of Figure 7.12³⁶ that air quality on parts of the existing M4 corridor will remain elevated *even in the advent of the proposed new motorway*.

54. The conclusion reached – and confirmed by the Welsh Government – is that the proposed development is unnecessary for the purpose of meeting air quality standards.

Air pollution – regional load and environmental receptors

55. 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).

56. 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 terms³⁷.

57. And the Welsh Government acknowledges the likely impact of the road on encouraging more vehicles onto the road, resulting in *greater* eventual greenhouse gas emissions than in the absence of the scheme:

“However, an increase in CO₂ is predicted in the future year likely due to the increase in capacity leading to more vehicles on the road in the future year”³⁸.

58. Major adverse increases in air pollution (NO_x) will result from the proposed development at the following designated sites³⁹:

- St. Brides North
- St. Brides South
- Nash and Goldcliff North
- Nash and Goldcliff South
- Whitson North
- Whitson South
- Redwick and Llandeenny
- Redwick and Llandeenny South

59. The Gwent Levels St Brides SSSI will suffer from 30µg/m³ NO₂ levels where it is at its closest point to the motorway⁴⁰.

³⁵ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> 7.8.8

³⁶ <http://gov.wales/docs/det/policy/160310-m4-es-c7-figures.pdf> Figure 7.12

³⁷ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> Table 7.24

³⁸ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> 7.8.18

³⁹ M4 Corridor around Newport Environmental Statement: Volume 3 Appendix 7.3 Construction Traffic and Operational Assessment Table 7.3.6

60. This meets the “critical level” threshold for protection of vegetation as described by the Welsh Government:

“The United Nations Economic Commission for Europe (UNECE) and the World Health Organisation (WHO) have set a critical level for NO_x, (30 µg/m³) for the protection of vegetation. Therefore, the statutory nature conservation agency’s (Natural Resources Wales) policy is to apply the 30 µg/m³ criterion as a benchmark, on a precautionary basis, in internationally designated conservation sites and in nationally designated Sites of Special Scientific Interest (SSSIs) designated for the protection of vegetation”⁴¹.

61. The Gwent Levels St Brides SSSI is so designated:

“The large number of hedgerows add to the diversity of the area and together with the main reed banks provide a habitat for nationally important assemblages of terrestrial invertebrates”⁴².

Noise - general

62. The Welsh Government acknowledges that noise from the existing motorway would be unlikely to increase appreciably in the ‘do minimum’ scenario:

“Growth on the existing M4 between 2014 and 2037 in the absence of the Scheme is expected to be between 1 and 2% per annum. In terms of the related increase in noise level, this would be minimal (approximately 1 dB) and the increase may also be mitigated, to some extent, by improvements in vehicle technology and legislative requirements, which will tend to reduce the sound contribution from each vehicle”⁴³.

63. DMRB states that:

“The effect of the speed of vehicles on noise level is one of the most fundamental in the noise prediction process. Above 40 km/hr, noise level increases with the speed of the vehicle and a reduction in speed will normally cause a reduction in noise level. In a similar way, the volume and composition of traffic has a direct influence on the noise level”⁴⁴.

64. Existing speed control measures on the M4 motorway around Newport are presumably having a reductive impact on noise.

65. With regards to low noise surfaces, the DMRB states that:

“The principal benefit of low-noise surfaces is the reduction in mid and higher frequencies of noise generated by tyres at speeds in excess of 75 km/hr. They are less effective in reducing noise at low speeds where engine noise particularly from heavy vehicles is more dominant. These surfaces also create a relatively smooth running surface that in some cases can help to eliminate ground borne vibration”.

⁴⁰ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> 7.8.12

⁴¹ <http://gov.wales/docs/det/policy/160310-m4-es-c7-air-quality.pdf> 7.2.9

⁴² http://naturalresources.wales/media/640899/SSSI_0341_Citation_EN0014d9a.pdf

⁴³ M4 Corridor around Newport Environmental Statement Volume 1: Chapter 13 Noise and Vibration 13.4.8

⁴⁴ M4 Corridor around Newport, Environmental Statement Volume 3: Appendix 13.4, Noise and Vibration. Operational Noise and Vibration Assessment 1.2.8

66. As part of the design, the proposed new section of motorway would include a thin surfacing system or similar (such as stone mastic asphalt (SMA)), having relatively good 'low-noise' properties. The principal benefit of low-noise surfaces is the reduction in mid and higher frequencies of noise generated by tyres at speeds in excess of 75 km/hr (approximately 47 mph). This would attain -3.5 dB attenuation of traffic noise as compared to hot rolled asphalt.

67. Presumably, in order to reduce noise on the existing M4 still further, this type of surfacing could be installed during the next resurfacing event.

68. DMRB states that mitigation measures:

“may include the construction of environmental barriers – the term 'barrier' means any object that interrupts the path of noise transmission between source and receiver/receptor, this includes a close-boarded wooden fence, brick wall, concrete parapet, earth bund, or combination (i.e. earth bund with a fence running along the top or motorway edge safety barriers if solid concrete)... The potential benefits of mitigation measures vary widely according to circumstances. For example, environmental barriers can provide reductions of 10 dB or more for well-screened locations relatively close to the source”⁴⁵.

69. Again, the question arises as to whether or not environmental barriers have been fully utilised on the existing M4 to reduce the noise visited upon sensitive receptors.

Noise – residential receptors

70. We note that the noise sensitivity assessment denoted residential receptors as of 'medium' sensitivity:

“This balances their high importance against their low rarity”⁴⁶.

71. We find it difficult to understand the reasoning for this classification, which has significant ramifications. If residential receptors are 'highly important' then their 'low rarity' – whatever meaning that phrase has – is irrelevant to an objective assessment of their sensitivity.

72. It is also inconsistent with decisions on sensitivity made by other jurisdictions. For example, in the Highways Agency's treatment of the M4 junctions 3 to 12 project in March 2015, residential receptors repeatedly received the following acknowledgement:

*“The vast majority of potentially sensitive receptors are residential properties, which are classed as being of **high** sensitivity to road traffic noise” [emphasis in original]⁴⁷.*

73. Transport Scotland classes residential receptors as follows:

⁴⁵ M4 Corridor around Newport, Environmental Statement Volume 3: Appendix 13.4, Noise and Vibration. Operational Noise and Vibration Assessment 1.2.12-13

⁴⁶ M4 Corridor around Newport Environmental Statement Volume 1: Chapter 13 Noise and Vibration 13.3.37

⁴⁷ http://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010019/2.%20Post-Submission/Application%20Documents/Environmental%20Statement/6-1-ES-Chapters_12-Noise-and-vibration.pdf 12.4.2, 12.7.2, 12.8.2, 12.9.2, 12.10.2, 12.11.2, 12.12.2, 12.13.2

“Residential properties are classed as of high sensitivity [to construction and operational noise of highways]”⁴⁸.

74. 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:

“the magnitude of impact in the absence of the Scheme is considered to range between negligible beneficial and minor adverse, with the majority of receptors experiencing a negligible noise increase, due to general traffic growth in the area”⁴⁹.

75. In contrast, with the scheme, 1,203 receptors would experience a significant increase in noise (in some cases as much as 18 dB)⁵⁰.

76. Strangely, in the ‘additional mitigation’ scenario, nearly as many (1,138) receptors would experience a significant increase in noise, but with increases of up to 21 dB⁵¹.

Noise – environmental receptors

77. The Environmental Statement draws the following conclusion in relation to internationally designated sites:

“Since there would be no further physical incursions into the sites, there would be no operational effects on the designated sites per se. The magnitude of impact on internationally designated sites (International (Very high) value) would thus be No Change and the significance of effect would be Neutral”⁵².

78. However, there is overwhelming peer-reviewed scientific evidence exists that the proximity of traffic to habitats has a deleterious effect on wildlife⁵³.

⁴⁸ [http://www.transport.gov.scot/system/files/uploaded_content/documents/reports/Chapter_12 - Noise and Vibration.pdf](http://www.transport.gov.scot/system/files/uploaded_content/documents/reports/Chapter_12_-_Noise_and_Vibration.pdf) 12.2.6

⁴⁹ M4 Corridor around Newport Environmental Statement Volume 1: Chapter 13 Noise and Vibration 13.8.14-16

⁵⁰ M4 Corridor around Newport Environmental Statement Volume 1: Chapter 13 Noise and Vibration 13.8.28

⁵¹ M4 Corridor around Newport Environmental Statement Volume 1: Chapter 13 Noise and Vibration 13.12.6

⁵² <http://gov.wales/docs/det/policy/160310-m4-es-c10-ecology.pdf> 10.9.5

⁵³ See, for example: <http://www.ecologyandsociety.org/vol14/iss1/art29/> “A range of evidence supports an important effect of traffic noise on birds in roadside habitats”

[http://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(09\)00261-4](http://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(09)00261-4) “recent studies... document substantial changes in foraging and anti-predator behavior, reproductive success, density and community structure in response to noise”

<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-294X.2007.03487.x/abstract> “Many bird species are less abundant near highways and studies are becoming available on reduced reproductive success in noisy territories”.

<http://rspb.royalsocietypublishing.org/content/280/1773/20132290> “We document over a one-quarter decline in bird abundance and almost complete avoidance by some species... suggesting that traffic noise is a major driver of effects of roads on populations of animals”.

http://www.dtpli.vic.gov.au/_data/assets/pdf_file/0003/234372/435-Ecological-impacts-of-Road-noise-extract.pdf “Road noise has a variety of ecological impacts, including effects on the physiology, behaviour, communication, reproduction and survival of animals that live in or move through the noise-affected areas.

<http://www.sciencedirect.com/science/article/pii/S0006320707003540> “the overall negative effect of traffic on anuran populations in northeastern North America is at least as great as the negative effect of deforestation”

http://www.jstor.org/stable/2404428?origin=crossref&seq=1#page_scan_tab_contents “noise load is probably the most important cause of the reduced densities [of birds]”

[http://www.cell.com/current-biology/abstract/S0960-9822\(09\)01328-1](http://www.cell.com/current-biology/abstract/S0960-9822(09)01328-1) “noise alone reduces nesting species richness and leads to different avian communities”.

79. The direct effect on animal populations of operational roads is described thus:
“many wildlife species are less common or absent near roads... these road-avoidance zones can extend to more than 1,000m... effectively result[ing] in the loss of a population”⁵⁴.
80. The Environmental Statement casually disregards the impact of the new motorway on some existing Sites of Nature Conservation Interest⁵⁵:
“A number of these [SINCs] 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”⁵⁶.
81. However the noise maps in the Orders indicate to the contrary. Although the Welsh Government has not published a single map comparing the operational noise with and without the scheme (2037), we can crudely assess the situation by comparing Figures 4 and 6/8/10, and by use of Figure 15⁵⁷.
82. For example, Figure 4 indicates a maximum noise level – in the absence of the scheme – of 60 dB (most likely 55 dB) in the vicinity of Pant-rhiw-goch wood and Coal Pit Lane pond. But *with* the scheme, we see maximum noise levels at these two SINCs of up to at least 75 dB (Figure 6).
83. Scrutiny of these figures clearly shows the expectation of increased noise of:
- Up to 12 dB at Pant-rhiw-goch wood (see Figure 10.3⁵⁸ (a, b and c) for location in relation to the proposed development
 - Up to 12 dB at Coal Pit Lane pond
 - Up to 3 dB at Wilcrick Fort West
84. This increased noise is in relation to the opening year (2022). Noise is anticipated to increase to 2037, worsening the situation for these SINCs.
85. Using the Welsh Government’s own classification, the noise impacts at Pant-rhiw-goch and Coal Pit Lane would both be described as “major”⁵⁹.
86. These SINCs are ones which have been disregarded by the Welsh Government in cavalier manner as unlikely to suffer “additional disturbance”.
87. The Welsh Government confesses:

<http://www.sciencedirect.com/science/article/pii/S0006320708002024> “Because acoustic communication is involved in crucial behaviours, noise pollution can be particularly detrimental in affecting breeding success or survival... Traffic noise triggered a decrease of the males’ calling activity, with males being more affected when noise amplitude increased”.

⁵⁴ Chapter 12 of http://link.springer.com/chapter/10.1007%2F1-4020-4504-2_12

⁵⁵ [http://www.newport.gov.uk/documents/Planning-Documents/LDP-2011-2026/Sites-of-Importance-in-Nature-Conservation-\(SINC\)-January-2013.pdf](http://www.newport.gov.uk/documents/Planning-Documents/LDP-2011-2026/Sites-of-Importance-in-Nature-Conservation-(SINC)-January-2013.pdf)

⁵⁶ <http://gov.wales/docs/det/policy/160310-m4-es-c10-ecology.pdf> 10.9.11

⁵⁷ M4 Corridor around Newport, Environmental Statement Volume 3: Appendix 13.4, Noise and Vibration. Operational Noise and Vibration Assessment Figures 4,6 and 15

⁵⁸ <http://gov.wales/docs/det/policy/160310-m4-es-c10-figures.pdf>

⁵⁹ M4 Corridor around Newport Environmental Statement Volume 1, Chapter 13: Noise and Vibration, 13.3.54

“No mitigation for noise effects on wildlife is proposed with respect to the operation of the Scheme”⁶⁰.

88. But even more serious is that for those SINCs which receive consideration of operational impact of the new motorway, noise is not even considered. This is despite the statements that:

“other impacts during operation which may affect ecological receptors include... effects of noise disturbance”⁶¹

“there are other SINCs 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”⁶².

89. We should bear in mind that some of these sites will go from being quiet, undeveloped sites to being directly adjacent to, or underneath, the new motorway. These include Afon Ebwy and Marshall’s SINC – noise levels projected to be 45-50 dB in 2037 in the absence of the scheme⁶³ - which are likely to be disrupted by noise levels of anything up to as much as 70 dB if the scheme is completed⁶⁴. The Welsh Government notes:

“The survey showed that the saltmarsh beside the River Ebbw is of particular conservation importance”⁶⁵.

90. Otters – a protected species which is present in the Usk and Ebwy – are, according to Transport Scotland:

“likely to suffer disturbance from traffic noise as well as from road lighting during the operational phase”⁶⁶

91. However, in relation to otters, the Welsh Government has concluded that:

“an area of scrub located to the east of the River Ebbw and north of the new section of motorway has previously been identified as a holt site and is of potential value for resting otters. Due to the extent and location of this habitat, the new road is not considered to be of concern with regard to noise or vibration disturbance, should otters chose to use the area during the operational phase”⁶⁷.

92. And the Welsh Government’s approach of assuming nil importance to traffic noise should be compared with the treatment offered by the Highways Agency:

*“The AONB, four SSSIs and four Local Nature Reserves are classed as being of **high** sensitivity to road traffic noise” [emphasis in original]⁶⁸.*

⁶⁰ <http://gov.wales/docs/det/policy/160310-m4-es-c10-ecology.pdf> 10.9.317

⁶¹ <http://gov.wales/docs/det/policy/160310-m4-es-c10-ecology.pdf> 10.9.3

⁶² <http://gov.wales/docs/det/policy/160310-m4-es-c10-ecology.pdf> 10.9.11

⁶³ See M4 Corridor around Newport, Environmental Statement Volume 3: Appendix 13.4, Noise and Vibration. Operational Noise and Vibration Assessment Figure 4

⁶⁴ See M4 Corridor around Newport, Environmental Statement Volume 3: Appendix 13.4, Noise and Vibration. Operational Noise and Vibration Assessment Figure 6

⁶⁵ M4 Corridor around Newport, Environmental Statement Volume 1, Chapter 19: Conclusions, 19.8.82

⁶⁶ <http://www.transport.gov.scot/report/j11223-078.htm>

⁶⁷ <http://gov.wales/docs/det/policy/160310-m4-es-c10-ecology.pdf> 10.9.128

⁶⁸ http://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010019/2.%20Post-Submission/Application%20Documents/Environmental%20Statement/6-1-ES-Chapters_12-Noise-and-vibration.pdf 12.4.5, 12.7.4, 12.8.4, 12.10.4

93. The Inspector will be advised that we have not had the opportunity to explore every single failure of the Welsh Government to account for operational noise impact on environmental receptors. Suffice to say that the approach is fundamentally flawed and fails to follow good practice already established by both Transport Scotland and the English Department for Transport.

Climate change

94. The consultation documents appear to ignore the potential impact of climate change on sea level rise. For example:

“With currently proposed improvements to the Gwent Levels sea defences, the proposed new section of motorway would not be at risk of tidal flooding up to the year 2030 notwithstanding sea level rises due to climate change. Continued improvements to sea defences beyond 2030, in line with Welsh Government policy to ‘Hold the Line’ would ensure that the proposed new section of motorway would remain flood free into the future, notwithstanding sea level rises due to climate change”⁶⁹.

95. 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 likely⁷⁰, and that sea level rise of a scale of metres is possible this century⁷¹.

96. 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”⁷².

97. From 2038 onwards, the ‘do something’ scenario produces more carbon emissions than the ‘do minimum’ alternative⁷³. The climate is impacted by total emissions. This scheme is therefore ultimately more climate-damaging than the ‘do minimum’ alternative.

98. The carbon report assumes either expenditure of up to £2.3 billion, in order to achieve ‘negligible’ change in carbon emissions, or zero expenditure. However, climate and expenditure is not a zero-sum game. The £2.3 billion could be spent elsewhere. For example, at a cost of £20,000 per house⁷⁴, 115,000 houses in Wales could be made ‘nearly zero carbon’, saving £500 per year in fuel

⁶⁹ M4 Corridor around Newport, Environmental Statement Volume 1, Chapter 19: Conclusions, 19.14.8

⁷⁰ <http://www.reuters.com/article/us-climatechange-seas-idUSKBN0KN25520150114>

⁷¹ <https://www.theguardian.com/science/2016/mar/22/sea-level-rise-james-hansen-climate-change-scientist>

⁷² <http://gov.wales/docs/det/policy/160310-m4-es-c16-drainage-water-environment.pdf> 16.4.98

⁷³ A statement on the carbon report for the proposed M4 scheme, Glynn and Anderson, April 2016

⁷⁴ <http://www.constructionproducts.org.uk/publications/sustainability/low-carbon-domestic-refurbishment-guide/>

Assumed cost in 2014 was £25,000 per dwelling, but assuming a substantial saving from scheme roll-out

bills⁷⁵, making a £57.5 million cash injection into the Welsh economy annually and saving 286,000 tonnes of carbon dioxide each year⁷⁶.

99. The Welsh Government appears not to grasp the scale of the planetary emergency that is facing us in terms of climate change. Expenditure on a project that is carbon-intensive and locks in additional high-carbon modes of transport does not lead us on to the path to a 1.5°C future, nor does it align with our obligations towards future generations.

Economic appraisal

100. 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.
101. The published “total costs for economic appraisal” explicitly exclude VAT and inflation⁷⁷.
102. The published costs also apparently exclude inflation of construction costs. Assuming construction inflation to be 5% per year, and assuming 0% construction completed by end of 2016 and 20% in each of the following five years, we calculate that inflation adds £175 million to the costs presented by the Welsh Government.
103. A highway infrastructure scheme such as this is not exempt from VAT. This adds 20% to the cost.
104. The economic appraisal considers 60-year maintenance costs on the new motorway to be £247 million⁷⁸.
105. There is no explanation as to why the expected maintenance costs have reduced by 60% since the economic appraisal of July 2014, which put them at £613 million⁷⁹.
106. We have calculated the total cost of the scheme to be in the region of £2.3 billion⁸⁰.
107. We further note that the “values of time” consultation⁸¹ referred to by the Welsh Government⁸² is likely to recommend a reduction in the reported economic benefits of schemes such as this. It is disappointing that an analysis was not conducted by the Welsh Government using the updated values.

⁷⁵ Assuming that £500 of the £700 average bill relates to space heating

⁷⁶ UK Government assumes average 15,000 kWh gas use per year. Emissions are [0.18445 kgCO2/kWh](#); total carbon saving (assuming 90% reduction) therefore 286,359 tonnes CO2e.

⁷⁷ <http://gov.wales/docs/det/report/160310-m4-economic-assessment-report.pdf> 5.1.2

⁷⁸ <http://gov.wales/docs/det/report/160310-m4-economic-assessment-report.pdf> 5.2.4

⁷⁹ <http://www.m4newport.com/assets/weltag-s1-2-report.pdf> pp 94-95

⁸⁰ <http://foe.cymru/news/welsh-government-%E2%80%9Cdeceiving-people-wales%E2%80%9D-m4-cost>

⁸¹ <https://www.gov.uk/government/publications/values-of-travel-time-savings-and-reliability-final-reports>

⁸² <http://gov.wales/docs/det/report/160310-m4-economic-assessment-report.pdf> 6.1.3

108. This is particularly the case given that the traffic forecast report splits ‘employer’s business’ and ‘commuting’⁸³ – one of the main new features of the UK Government’s consultation.
109. The economic appraisal ‘annualises’ different categories of time use of the motorway⁸⁴. However the total hours covered by the appraisal is 5,363. There are 8,760 hours per year – no explanation is given for eliminating these additional 3,397 hours from the appraisal.
110. So the calculation understates the costs (because of construction cost inflation, unexplained reduction in maintenance costs, VAT and the new ‘values of time’ measures), which has an impact on the conclusions reached.
111. Particularly in the ‘low’ growth scenario, this is likely to push the appraisal into costing more than purported benefits.
112. Both the economic appraisal and the traffic forecasting model should be re-run using the new proposed ‘values of time’ as determined by the consultation response⁸⁵. This is because the current values for non-work travel date back to research from 2003, and the data supporting them date from over two decades ago⁸⁶.
113. For all these reasons the economic appraisal is not fit for purpose.

Sustainable development

114. The conclusions reached by the Sustainable Development report are a perversion of the word and spirit of sustainable development.
115. Most organisations define sustainable development through the Brundtland Report⁸⁷:
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:
- *The concept of needs, in particular the essential needs of the world’s poor, to which overriding priority should be given; and*
 - *The idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs”*
116. The Welsh Government refers to the definition used in *One Planet: One Wales*, and to the vision, whereby Wales:
- lives within its environmental limits, using only its fair share of the earth’s resources so that our ecological footprint is reduced to the global average availability of resources, and we are resilient to the impacts of climate change;

⁸³ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 3.6.1

⁸⁴ <http://gov.wales/docs/det/report/160310-m4-economic-assessment-report.pdf> 6.3.1

⁸⁵ <https://www.gov.uk/government/publications/values-of-travel-time-savings-and-reliability-final-reports>

⁸⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/470229/vtts-phase-2-report-non-technical-summary-issue-august-2015.pdf p3

⁸⁷ <http://www.un-documents.net/our-common-future.pdf> p41

- has healthy, biologically diverse and productive ecosystems that are managed sustainably;
- has a resilient and sustainable economy that is able to develop whilst stabilising, then reducing, its use of natural resources and reducing its contribution to climate change;
- has communities which are safe, sustainable and attractive places for people to live and work, where people have access to services, and enjoy good health;
- is a fair, just and bilingual nation, in which citizens of all ages and backgrounds are empowered to determine their own lives, shape their communities and achieve their full potential⁸⁸

117. On none of these counts can the proposed development be seen to contribute to a greater degree than the 'do minimum' alternative.

118. The Welsh Government goes on to state that WelTAG appraisals:
*"form an appraisal against sustainability criteria..."*⁸⁹

119. But the claim is made on the basis that WelTAG guidance states it to be so, not because it *is* so. WelTAG only assesses different options against the transport planning objectives – which are discredited in the section "Objectives" in Appendix 1 of this document.

120. So, for example, the sole measurement relating to climate change of the transport planning objectives is:
*"reduced greenhouse gas emissions per vehicle and/or person kilometre"*⁹⁰.

121. But as has been repeatedly pointed out by ourselves and others to the Welsh Government, the climate cares not about the relative efficiency of vehicles, nor miles travelled by people, but by the absolute emissions of greenhouse gases. In which case the transport planning objective should have been "reduced greenhouse gas emissions".

122. This case alone renders redundant the claim that WelTAG is any form of effective sustainability appraisal.

123. Through separating out public transport measures for separate consideration⁹¹, 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.

124. The Wellbeing of Future Generations Act requires that decisions are taken in a way that accords with the sustainable development principle. In order to act in that manner, a public authority must take account of:

⁸⁸ <http://gov.wales/docs/det/report/160310-m4-sustainable-development-report.pdf> 2.1.3

⁸⁹ <http://gov.wales/docs/det/report/160310-m4-sustainable-development-report.pdf> 3.4.1

⁹⁰ <http://gov.wales/docs/det/report/160310-m4-sustainable-development-report.pdf> 3.3.2

⁹¹ <http://gov.wales/docs/det/report/160310-m4-sustainable-development-report.pdf> 3.4.3

(a) the importance of balancing short term needs with the need to safeguard the ability to meet long term needs, especially where things done to meet short term needs may have detrimental long term effect;

(b) the need to take an integrated approach, by considering how—

(i) the body's well-being objectives may impact upon each of the well-being goals;

(ii) the body's well-being objectives impact upon each other or upon other public bodies' objectives, in particular where steps taken by the body may contribute to meeting one objective but may be detrimental to meeting another⁹².

125. In this case:

- Things done to meet short term needs will have a detrimental long-term impact (in greenhouse gas emissions and biodiversity loss, for example).
- Steps taken by the body to secure economic growth are detrimental to meeting other well-being objectives.

126. The report then tries to demonstrate compliance with the Well-Being Goals.

Goal	Welsh Government's contention	Our response
Innovative, productive and low carbon society	<ol style="list-style-type: none"> 1. Economic appraisal – good value for money 2. Innovative design 3. Reduced carbon footprint 	<ol style="list-style-type: none"> 1. Economic appraisal is flawed – see above 2. 'Innovative' refers to the society. There is no way in which a new motorway provides an innovative approach to transport challenges. 3. Carbon emissions will ultimately be higher as a result of the scheme, than they would with the 'do minimum' option.
Skilled and well-educated population	<ol style="list-style-type: none"> 1. Construction employs people 2. Access created to new development sites 	<ol style="list-style-type: none"> 1. Any construction scheme, be it for a hospital, school or motorway, will employ people 2. No evidence that there is a shortage of development sites. Indeed, for sustainable development it is preferable to support struggling <i>existing</i> development sites in the valleys
Resilient Wales	<ol style="list-style-type: none"> 1. Minimised environmental impact 2. Reducing greenhouse gas emissions "at the forefront of decision making" 3. Resilient to future climate change 	<ol style="list-style-type: none"> 1. Without this scheme, there would be no environmental impact on all the SSSIs, the SPA, the SINC and other greenfield sites. 2. Reducing greenhouse gas emissions has never been anything other than an afterthought. The scheme will increase greenhouse gas emissions. 3. The scheme ignores sea level rise associated with future climate change (see above)
Healthier Wales	<ol style="list-style-type: none"> 1. Improves air quality 2. Improves noise 	<ol style="list-style-type: none"> 1. Air quality improves significantly in the absence of the scheme (see above)

⁹² <http://www.legislation.gov.uk/anaw/2015/2/section/5/enacted>

		<p>2. Without the scheme, 38 receptors receive minor increased noise. With the scheme, 1,203 receptors receive significantly increased noise</p> <p>3. The road will induce traffic (i.e. people will drive more because of the extra road capacity). This will have a negative impact on people's health. By 2037, an additional 15,000 traffic movements per day will be induced by the new motorway⁹³, or a 23% increase in traffic.</p>
More equal Wales	1. No clear pattern of adverse impacts	1. Empirical evidence demonstrates that it is white, male, employed middle-class car drivers who will benefit most from new highway infrastructure. Every marginalised and disadvantaged category will disbenefit because the expenditure will mean reduced public finance for social/health/education expenditure that principally benefits people suffering from disadvantage. The full treatise on this finding is from points 34 to 42 of http://foe.cymru/national-transport-plan-consultation-response
Attractive, safe, viable, well-connected communities	<p>1. Financial compensation for destroyed property</p> <p>2. Reduced journey times</p>	<p>1. Difficult to see how a new motorway contributes to attractive communities.</p> <p>2. In the longer term, it is conceivable that the induced demand of the new highway will lead to journey times that are the same as, or similar to, current times.</p>
Vibrant culture, thriving Welsh language	1. By supporting tourism in west Wales, the Welsh language is supported	1. By reducing journey times to west Wales, it makes west Wales more desirable as a location for second/holiday homes. This is almost always damaging to communities, culture and the Welsh language.
Globally responsible Wales	1. Better connections to England and Ireland	1. Global responsibility is about taking responsibility for the impacts of activities in Wales on the world. This development, through increasing greenhouse gas emissions, has negative impacts on the world.

127. Many of these sustainability indicators are summed up by the Welsh Government, which describes many of the positive aspects of 'trip suppression' thus:

"...in a 'Do-Minimum' scenario where there is likely to be limited investment in new sections of highway capacity, the effects of forecast traffic growth and the subsequent increase in traffic congestion can lead to "trip suppression" which could manifest itself as peak spreading, modal switching to public transport, and/or a reduction in the number, length or frequency of journeys.

⁹³ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> Figure 9.10: adding the 'do something' flows and comparing to the 'do minimum' flows

*These responses, as well as re-distribution, can lead to reduced vehicle kilometreage on the road network*⁹⁴.

128. If highly significant, permanent environmental damage can be rendered 'sustainable' via economic cost-benefit analysis then the provisions of sustainability legislation are fundamentally and fatally compromised.

Transport forecast

129. The factors used:
*"do not take account of the level of congestion or other factors (such as traffic restraint measures) which may limit the potential for all the demand to use the network..."*⁹⁵.
130. This is an obvious flaw in the methodology. We would be grateful for the Welsh Government's analysis of the impact of this on the forecast.
131. In relation to public transport, the Welsh Government claims that:
*"There are other potential elements of the metro proposals which include bus rapid transit services, bus lanes and trams within Cardiff itself, but these will not impact on traffic numbers on the M4 to any significant extent and have therefore not been included in the model"*⁹⁶.
132. However, this is clearly not the case. If improving transport infrastructure benefits economic development – which is indeed the whole premise for the benefit-cost analysis and sustainable development sections of the Draft Orders – then we would anticipate improved employment opportunities to arise in Cardiff as a result of these developments. That would mean that people living in and around Cardiff who would otherwise potentially use the M4 to access employment to the east would instead use public transport to access these new opportunities in Cardiff.
133. The Welsh Government's modelling claims that over the 23-year period from 2014, growth of rail transport will be 10-14%⁹⁷. This appears to be understatement of a degree that is destabilising for the traffic forecast. Over an 18-year period from 1997, growth of station use in the south Wales metro area included:
- Newport – 86%
 - Cardiff Central – 104%
 - Bridgend – 143%
 - Cathays – 296%
 - Ninian Park – 466%
 - Llanharan – 510%
 - Newbridge – 544%
 - Rogerstone – 855%
 - Trefforest – 945%

⁹⁴ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 3.4.2

⁹⁵ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 4.2.5

⁹⁶ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 7.2.2

⁹⁷ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 7.3.3

- Cardiff Bay – 1,121%

Most stations on the network showed a sumptuous increase in use⁹⁸.

134. These flaws in the transport modelling needs to be rectified.

135. 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”⁹⁹.

136. We would be grateful for the evidence base for this: ‘general acceptance’ is not an empirical degree of reference.

137. This is important, because 80% is subsequently used to determine the point at which journey time is negatively affected¹⁰⁰, and which presumably also feeds into the economic analysis.

138. We note 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: *“The restricted capacity of the Tunnels forms a regular bottleneck on the motorway at peak times, while traffic queuing to leave the motorway at Junctions 26 and 28 frequently extends onto the mainline”¹⁰¹.*

139. We also note 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”¹⁰².

140. It would appear that only limited relief is being offered by the provision of a relief road.

141. In 2007, when the WeITAG planning stage workshop took place, an assumption of increasing traffic would not have been irrational. However, data from recent years have shown the assumption of never-ending increases in road traffic to be a fallacy (Figure 1 in this document)¹⁰³.

⁹⁸ <http://www.bettertransport.org.uk/maps/rail-usage.html>

⁹⁹ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 9.4.5

¹⁰⁰ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 9.4.6

¹⁰¹ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 9.4.7

¹⁰² <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 9.4.10

¹⁰³ Department for Transport, 2012, [Motor vehicle traffic \(vehicle kilometres\) by local authority in Great Britain, annual from 1993](#)

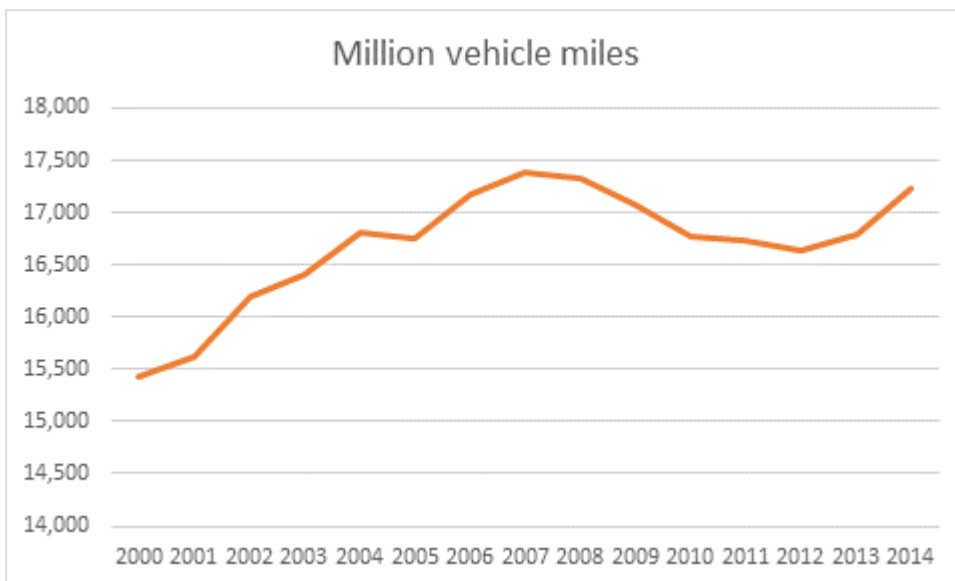


Figure 1. Traffic volumes in Wales, 2000-2014 (million vehicle miles)¹⁰⁴

142. There was a sequential year-on-year decrease in traffic in Wales for the five years after the peak of traffic in 2007, although those decreases were reversed in 2013 and 2014. Traffic volumes in Wales in 2014 were 1% lower than they were in 2007.
143. The forecast for growth in the Welsh Government’s consultation document has already been shown to be in excess of actual flows for 2012 and 2013¹⁰⁵. The only graph that has ever appeared to give information on year-on-year increases – figure 5 in the draft plan document¹⁰⁶ - suggests that traffic volumes in south-east Wales would be 5% greater in 2014 than they were in 2005.
144. No definition is provided of the south-east Wales local authorities, although the draft plan document refers to the National Transport Plan¹⁰⁷, in which no definition is provided. We are using the authorities that once comprised the South East Wales Transport Alliance: Blaenau Gwent, Bridgend, Caerffili, Cardiff, Merthyr Tudful, Monmouthshire, Newport, Rhondda Cynon Taf, Torfaen and the Vale of Glamorgan.
145. In 2005, total traffic in these authorities was 7,928 million vehicle miles¹⁰⁸. In 2014, total traffic had increased to 8,125 million vehicle miles, an increase of 2.5%, **or 2.5% lower than the Welsh Government’s forecast**. It is a stunning demonstration of failure to correctly forecast traffic patterns.
146. Our conclusion is that the traffic forecast is not fit for purpose. It is for the Welsh Government to explain how a forecast that is doubly overstating the increase in traffic can be relied upon to justify massive public expenditure.

¹⁰⁴ <https://www.gov.uk/government/publications/road-traffic-estimates-in-great-britain-2012> TRA8901.xls

¹⁰⁵ <http://www.foe.co.uk/sites/default/files/downloads/m4-blue-route-45610.pdf> page 03

¹⁰⁶ <http://m4newport.com/assets/issue-m4-draft-plan-consultation-document.pdf> page 11

¹⁰⁷ <http://wales.gov.uk/docs/det/publications/100329ntpen.pdf>

¹⁰⁸ <https://www.gov.uk/government/publications/road-traffic-estimates-in-great-britain-2013> TRA8901.xls

147. In 2037, the new development offers a maximum journey time saving for travellers on the existing M4 of 4.5 minutes at peak rush hour. Time saving for travellers using the black route (i.e. travelling the entire distance between Magor and Dyffryn) is up to 9 minutes at peak rush hour in 2037, with the difference of 3 minutes at non-rush hour being essentially due to the shorter alignment of the route.
148. There will be around 35,000 traffic movements each day on the black route by 2037¹⁰⁹. 65% of these journeys will be ‘through trips’¹¹⁰. At peak hours, just under 3,000 or so people using the black route every hour¹¹¹ will save up to 9 minutes of travel time.
149. It appears that the Welsh Government is willing to commit massive expenditure and environmental degradation for travel time savings of 3 minutes for people using the motorway across 20 hours of the day, and of up to 9 minutes for a few thousand people at peak hours.

Statutory advisor on environment

150. Concerns have been raised that the separation of roles at the statutory advisor on the environment may have been compromised. We would be grateful for a full statement from Natural Resources Wales on how they have ensured full separation between the function of environmental protection and that of advising on mitigation.

¹⁰⁹ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> Figure 9.10

¹¹⁰ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> 9.5.2

¹¹¹ <http://gov.wales/docs/det/report/160310-m4-traffic-forecasting.pdf> Figures 9.7 and 9.9

Appendix 1 – Problems associated with the Welsh Government’s case

Summary

1. The Welsh Government has repeatedly failed to use “current knowledge” to inform its activities. Indeed, the analysis of transport problems on which the whole exercise is predicated dates back to 2007.
2. The Welsh Government has no means for measuring congestion, which is one of the primary reasons for undertaking infrastructure development.
3. Traffic volumes were in 2015 already 2.5% below the Welsh Government’s forecast in the first year for which data have become available. It is difficult to conceive of a more stunning failure to correctly forecast traffic patterns.
4. The Welsh Government’s insistence that the problems in 2014 are the same as those raised in 2012 (and 2007), unfettered by our challenges and evidence to the contrary, and by evidence available to the Welsh Government, is hugely problematic for them. Several reasonable alternatives have not been explored.
5. Using the common law argument that a decision maker must “ask themselves the right questions”, we find that the Welsh Government has asked itself the wrong questions, and this is the crux of the problem that now faces us: the wrong answers.
6. Far from reducing greenhouse gases, the new motorway would generate an additional 24,556 tonnes CO2 per annum just from the additional traffic generated by new road schemes.

Modelling/projections

7. One of the repeated failures of the Welsh Government’s consultations has been the paucity of evidence offered by the Welsh Government to support its assertion that congestion and traffic volumes are a problem in the M4 area around Newport.
8. Critical to this failure has been the Welsh Government’s portrayal of traffic around Newport as being of relentlessly increasing scale:
“The more congested road conditions become, the greater the risk of incidents and accidents occurring. In the future, the situation is expected to deteriorate further”¹¹².
9. An apparent reason for this misapprehension appeared in an earlier stage of the consultation process:
“A current understanding of the transport problems on the M4 corridor is then considered, originating

¹¹² <http://m4newport.com/assets/issue-m4-draft-plan-consultation-document.pdf> page 9

with the problems established in a WeITAG planning Stage workshop held in October 2007”¹¹³.

10. The theoretical underpinning of the Welsh Government’s reasoning is therefore at least nine¹¹⁴ years out of date, and pre-dates the flat-lining in traffic volumes seen since 2007. This in itself should not be problematic, because the Welsh Government should simply have updated its modelling as time went by – using “current knowledge” – as the SEA Directive requires.
11. However the Welsh Government has failed to update its reasoning, presumably because in so doing it would be forced to recognise that the underpinning theory of the programme had been discredited by unforeseen changes in traffic patterns.
- 12. The Welsh Government has therefore failed to use current knowledge in order to “ask itself the right question and take reasonable steps to acquaint itself with the relevant information to enable it to answer the question”.**
13. The consultation workshops of 13, 15 and 20 March 2012 were opened by Martin Bates, the Welsh Government’s M4 CEM Project Director. His opening remarks are quoted as follows:
*“To set the scene I am going to repeat a quotation from the Minister with responsibility for Transport, Carl Sargeant, who said “We’re all aware that congestion is a problem on this part of the M4, so easing the flow on the M4 between Magor and Castleton is a key priority for the Welsh Government and a commitment in the prioritised National Transport Plan.”*¹¹⁵
14. The Welsh Government’s transport statistician has stated that the Welsh Government has no congestion statistics or indeed means of measuring congestion. The Department of Transport’s statistician for congestion in England confirmed on 18 January 2013 that the Welsh Government had – up until that date at least – made no contact with him in order to discuss congestion statistics.
- 15. The apparent priority of the Welsh Government – tackling congestion – has no basis in evidence.**
16. The Welsh Government tries to portray traffic numbers as a corollary for congestion. We have already demonstrated that the Welsh Government has no evidence on congestion.
17. Traffic numbers cannot be a corollary for congestion because it is possible to have very high traffic numbers moving at high speed without congestion. Likewise, very low traffic numbers can cause congestion if there are a few slow-moving vehicles (HGVs overtaking, for example) or a crash.
18. The principal serial uncorrected bias in the Welsh Government’s consultation – that of problems relating to congestion (for which the Welsh Government has no data) – occurs extensively

¹¹³ <http://www.m4cem.com/downloads/reports/ISSUE%20Report%20Stage%201%20Problems%20and%20Goals.pdf>
page 1

¹¹⁴ <http://wales.gov.uk/about/foi/responses/dl2013/octdec/transport1/atish7891/?lang=en>

¹¹⁵ http://www.m4cem.com/downloads/reports/Consultation%20Workshop%20Report%20Newport%20March%2013th%202012_for%20publication.pdf page 4

throughout the documents and is given as the purpose of making infrastructure investment in the area around Newport thus:

*“problems with congestion and unreliable journey times have been a fact of life on the M4 around Newport for many years”*¹¹⁶.

19. The phrase “fact of life” is a statement of opinion deliberately used to suppress challenge of its baseline assumption and is unsupported by data.
20. In 2007, when the WeITAG planning stage workshop took place, an assumption of increasing traffic would not have been irrational. However, data from recent years have shown the assumption of never-ending increases in road traffic to be a fallacy (Figure 1 in this document)¹¹⁷.

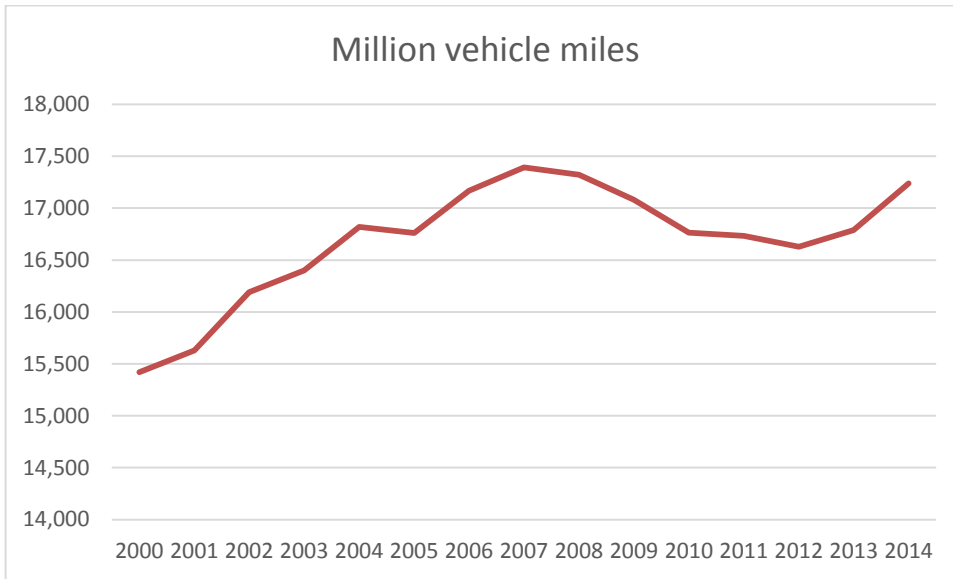


Figure 1. Traffic volumes in Wales, 2000-2014 (million vehicle miles)¹¹⁸

21. There was a sequential year-on-year decrease in traffic in Wales for the five years after the peak of traffic in 2007, although those decreases were reversed in 2013 and 2014. Traffic volumes in Wales in 2014 were 1% lower than they were in 2007.
22. The forecast for growth in the Welsh Government’s consultation document has already been shown to be in excess of actual flows for 2012 and 2013¹¹⁹. The graph that appears to be the sole basis for justifying a large infrastructure development – figure 5 in the draft plan document¹²⁰ - suggests that traffic volumes in south-east Wales would be 5% greater in 2014 than they were in 2005.
23. No definition is provided of the south-east Wales local authorities, although the draft plan document refers to the National Transport Plan¹²¹, in which no definition is provided. We are using the

¹¹⁶ <http://m4newport.com/assets/issue-m4-sea-environment-report---publication---c2.pdf> page 7

¹¹⁷ Department for Transport, 2012, [Motor vehicle traffic \(vehicle kilometres\) by local authority in Great Britain, annual from 1993](http://www.gov.uk/government/publications/road-traffic-estimates-in-great-britain-2012)

¹¹⁸ <https://www.gov.uk/government/publications/road-traffic-estimates-in-great-britain-2012> TRA8901.xls

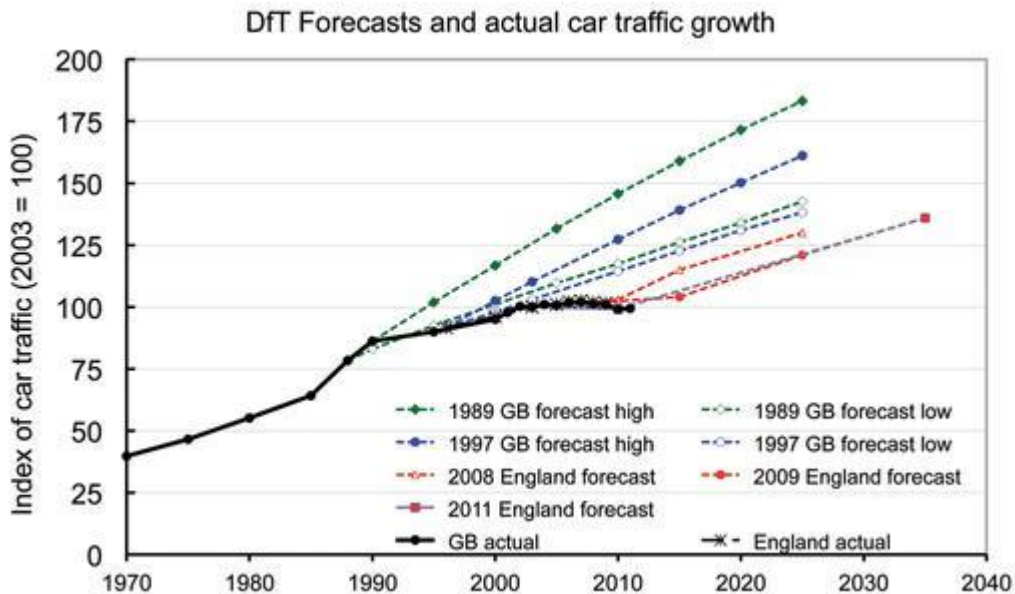
¹¹⁹ <http://www.foe.co.uk/sites/default/files/downloads/m4-blue-route-45610.pdf> page 03

¹²⁰ <http://m4newport.com/assets/issue-m4-draft-plan-consultation-document.pdf> page 11

¹²¹ <http://wales.gov.uk/docs/det/publications/100329ntpen.pdf>

authorities that once comprised the South East Wales Transport Alliance: Blaenau Gwent, Bridgend, Caerffili, Cardiff, Merthyr Tudful, Monmouthshire, Newport, Rhondda Cynon Taf, Torfaen and the Vale of Glamorgan.

- 24. In 2005, total traffic in these authorities was 7,928 million vehicle miles¹²². In 2014, total traffic had increased to 8,125 million vehicle miles, an increase of 2.5%, **or 2.5% lower than the Welsh Government's forecast**. It is a stunning demonstration of failure to correctly forecast traffic patterns.
- 25. The principal reason for the consultation recommending infrastructure interventions to the M4 around Newport – that of congestion and increasing volume of traffic – has no basis in evidence.
- 26. As we will see below, this lack of evidence has not stopped the Welsh Government from eliminating non-infrastructure options from the consultation.
- 27. Traffic forecasting by the Department for Transport has been risible¹²³:



- 28. Professor of Transport Policy Phil Goodwin comments:
*"The figure you see above is the result so far, for car traffic, showing successive downwards revision of the forecasts as for 25 years car traffic stubbornly refused to behave according to expectations. The revisions were of the form 'growth later', not 'less growth... anybody, just anybody, looking at this graph is going to think that there is a downside risk of the long term traffic flows being substantially less than the forecasts, as they have continually been for at least the last quarter of a century"*¹²⁴.

- 29. Professor Goodwin's comments are backed up by Dr Anna Goodman, who states:

¹²² <https://www.gov.uk/government/publications/road-traffic-estimates-in-great-britain-2013> TRA8901.xls

¹²³ <http://www.bettertransport.org.uk/campaigns/roads-to-nowhere/ltt-130412>

¹²⁴ <http://www.bettertransport.org.uk/campaigns/roads-to-nowhere/ltt-130412>

“This paper adds to the evidence that, after increasing for decades, levels of car use in England and Wales may now flattening or declining. If so, this suggests that forecasts by the Department for Transport may overestimate future demand for car travel by assuming that this demand will continue to increase”¹²⁵

30. Friends of the Earth Cymru has calculated a ‘back-cast’ based on factors that mimic the forecasted growth in traffic volumes by the Welsh Government (Figure 2 in this document).

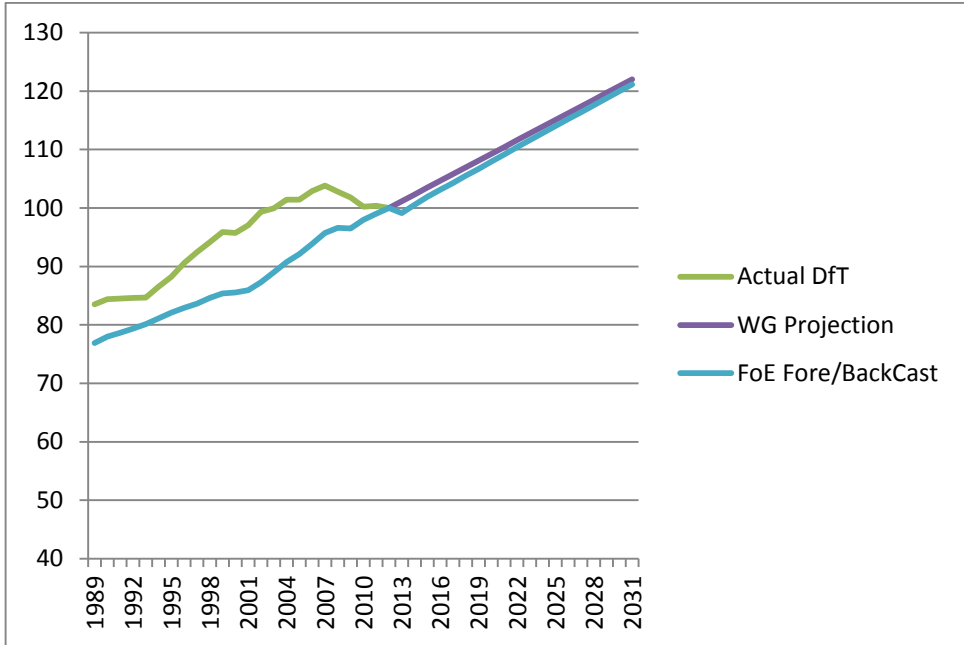


Figure 2. A back-cast using factors that mimic the Welsh Government’s forecast for traffic growth

31. The model used by the Welsh Government appears to be seriously deficient, with factors as yet unaccounted for having a major impact on the forecast.
32. By 2014 the distance travelled in a car¹²⁶ (as either driver or passenger) had decreased by 12.8% since 2002¹²⁷ to 5,067 miles per person per year¹²⁸. People have now reduced the number of travel trips to 921, which is fewer than at any time since records began in 1972/73¹²⁹.
33. People are also travelling less distance overall; the average distance travelled per person (6,488 miles) is lower than at any time since 1989¹³⁰.

¹²⁵ <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0071790>

¹²⁶ In England; no such survey data is available for Wales

¹²⁷ When people travelled 5,808 miles per annum

¹²⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/35603/nts0309.xls

¹²⁹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/487694/annual-road-traffic-estimates-2014.zip Table 0101

¹³⁰ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/487694/annual-road-traffic-estimates-2014.zip Table 0101

34. The National Travel Survey conclusions are borne out by recent statistics¹³¹. In 2012-13 just 59,260 driving tests were conducted in Wales, the lowest figure since records began in 2001-02¹³². The figure is a 32% reduction from the peak of 87,037 in 2006-07.

Objectives

35. The Welsh Government:

*“with your input, has identified 15 goals for the M4 Corridor around Newport. These goals aim to address the identified transport related problems”*¹³³.

36. The 15 goals – which are also the Transport Planning Objectives – were adopted as a result of consultation with a limited number and range of stakeholders in 2007 (not 2012)¹³⁴, and were never subject to public consultation. The Welsh Government does not appear to have published a list of the stakeholders who were invited to contribute to the list of ‘problems’ or goals.

37. The original list of problems to be solved by the M4 CEM, on which the goals were based, and which were substantively unchanged by the SEA consultation, was *“outlined for the public in a brochure distributed in April 2006”*¹³⁵. It first appears in the M4CEM process in a highway planning workshop held in 2007¹³⁶ and is therefore nine years out of date.

38. Article 5(2) of the SEA Directive requires that *“current knowledge and methods of assessment”* be used in order to determine reasonable alternatives. **The SEA consultation has not used statistics that are up to date, nor methods of assessment that are rigorous.** These failures have led the Welsh Government to propose a plan that has discounted non-infrastructure alternatives, and together mean that **Articles 5(1) and 5(2) have been breached.**

39. The Welsh Government has not taken the opportunity to modify the goals and objectives of the M4 Corridor around Newport, using the following rationale:

*“17 problems were identified; which encompassed issues of capacity, (network) resilience, safety and sustainable development. It is considered that the problems have not changed since 2012. 15 goals were identified and each one aimed to address one or more of the problems. As the problems have not changed there was no need to revisit the goals”*¹³⁷.

¹³¹ Statistics are not available more recently than 2012-13 <http://gov.wales/statistics-and-research/people-vehicle-licensing-ownership/?lang=en>

¹³² <http://wales.gov.uk/docs/statistics/2013/131022-people-vehicle-licensing-vehicle-ownership-2012-en.xls> Table 5

¹³³ <http://m4newport.com/assets/the-plan---english.pdf> page 21

¹³⁴ <http://www.m4cem.com/downloads/reports/ISSUE%20Report%20Stage%201%20Problems%20and%20Goals.pdf> pages 2-3

<http://www.m4cem.com/downloads/reports/ISSUE%20Report%20Stage%201%20Problems%20and%20Goals.pdf> page 1

¹³⁵ <http://wales.gov.uk/about/foi/responses/dl2013/octdec/transport1/atish7891/?lang=en>

¹³⁶ <http://www.m4cem.com/downloads/reports/ISSUE%20Report%20Stage%201%20Problems%20and%20Goals.pdf> page 1

¹³⁷ <http://m4newport.com/assets/issue-m4-sea-environment-report---publication---c2.pdf> page 9

40. Even considering just one of the problems identified, namely safety¹³⁸, the Welsh Government is wholly unjustified in stating that “the problems have not changed”.
41. The Welsh Government’s own plan adoption statement makes clear:
“The Variable Speed Limit (VSL) system was introduced in June 2011 between Junctions 24 and 28, in order to improve safety conditions and traffic flow in the short term. In 2012 and 2013 there was a reduction in accidents compared with previous years”¹³⁹.
42. This stretch of motorway was already of superlative safety prior to 2012¹⁴⁰.
43. Listed below are the problems listed in the SEA, and reasons why they are not based on evidence or are otherwise irrational.

Problem	Concerns
Regular congestion at peak times over extended periods.	Welsh Government has no congestion statistics. Wholly unsubstantiated by evidence; Welsh Government approach partially discredited by Welsh Government ¹⁴¹
The M4 around Newport is used as a convenient cross town connection for local traffic, with insufficient local road capacity.	No evidence provided that 40% of journeys 20 miles or less is an unusual figure; data date from 2005 and are out of date. Junction closures would appear to be the solution to this problem, and are acknowledged by Welsh Government to be effective at reducing traffic on the M4 ¹⁴² .
HGVs do not operate efficiently on the motorway around Newport.	No evidence provided
There is insufficient capacity through some of the Junctions (e.g. 3 lane capacity drops to 2 lane capacity).	Sufficient capacity is related to congestion, of which no measure is available, or traffic numbers, which are declining
The 2-lane Brynglas tunnels are a major capacity constraint.	Sufficient capacity is related to congestion, of which no measure is available
The M4 cannot cope with increased traffic from new developments.	No modelling provided of traffic generated by new developments; no description of what is meant by ‘cannot cope’
Difficulties maintaining adequate traffic flows on the M4 and alternative highway routes at times of temporary disruption; alternative routes are not able to cope with M4 traffic.	The same is true of most roads; alternative routes anywhere in the UK are unlikely to be able to cope with motorway traffic because they are not motorways

¹³⁸ <https://www.foe.co.uk/sites/default/files/downloads/m4-consultation-response-21874.pdf> para 62

¹³⁹ <http://m4newport.com/assets/the-plan---english.pdf> page 18

¹⁴⁰ <https://www.foe.co.uk/sites/default/files/downloads/m4-consultation-response-21874.pdf> para 62

¹⁴¹ Extensively discredited by Friends of the Earth Cymru in our July 2012 response. Welsh Government consultation document page 22 “However, traffic congestion will not simply disappear as a result of capacity increase”.

¹⁴² <http://www.m4cem.com/downloads/reports/M4%20CEM%20Stakeholder%20Workbook.pdf> page 33

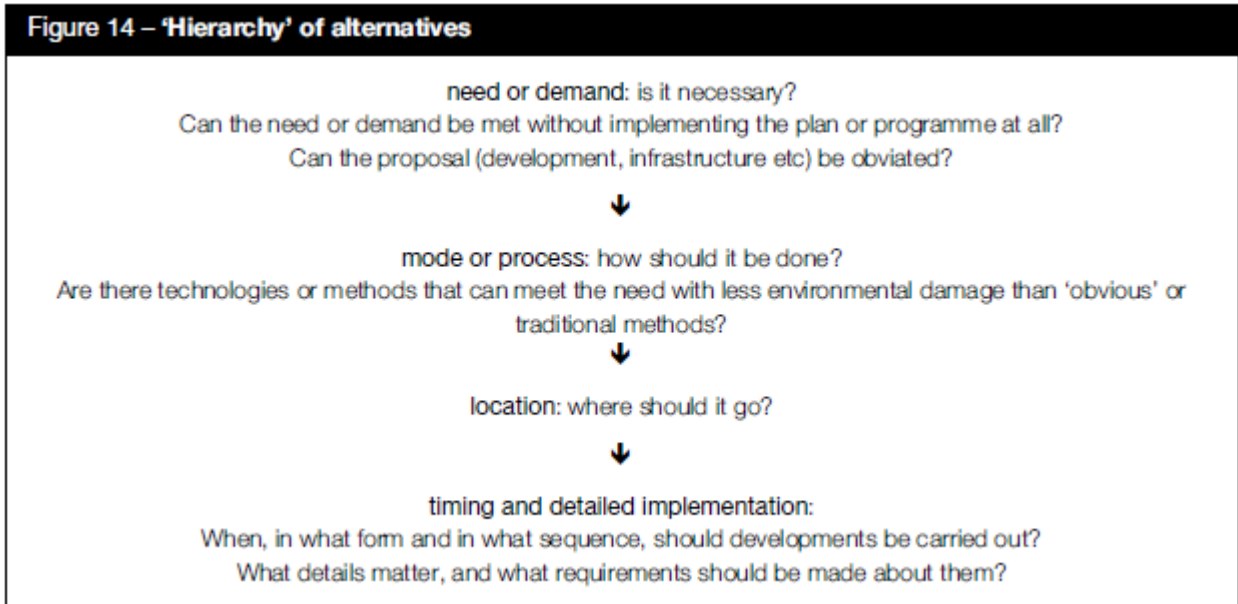
The road and rail transport system in and around the M4 Corridor is at increasing risk of disruption due to extreme weather events.	The same is true of all roads and railways
When there are problems on the M4, there is severe disruption and congestion on the local and regional highway network.	The same is true of all motorways
The M4 requires essential major maintenance within the next 5-10 years; this will involve prolonged lane and speed restrictions, thus increasing congestion problems.	The same is true of most roads; maintenance of existing highways does not of itself necessitate highway infrastructure development elsewhere; no congestion data available
There is insufficient advance information to inform travel decisions when there is a problem on the M4.	Solution is to provide better advance information, not build new highway infrastructure
The current accident rates on the M4 between Magor and Castleton are higher than average for UK motorway.	Friends of the Earth Cymru research indicates this is untrue; these sections of motorway are safer than average, as confirmed by Welsh Government ¹⁴³
The existing M4 is an inadequate standard compared to modern design standards.	This is not a problem if it causes no problems
Some people's driving behaviour leads to increased accidents (e.g. speeding, lane hogging, unlicensed drivers).	Highway infrastructure development is unlikely to change people's driving behaviour for the better
There is a lack of adequate sustainable integrated transport alternatives for existing road users	Highway infrastructure development is unlikely to improve this
Traffic noise from the motorway and air quality is a problem for local residents in certain areas	Highway infrastructure development is unlikely to improve this; or will create a problem for local residents elsewhere
The existing transport network acts as a constraint to economic growth and adversely impacts the current economy.	No evidence provided to back up this assertion

44. Despite Friends of the Earth Cymru having contested – and rebutted – several of the ‘problems’ through our consultation responses of July and December 2012, and December 2013, the Welsh Government appears to have determined that not one of our rebuttals has enough merit to reconsider the objectives.

45. Welsh Government SEA guidance provides for a ‘hierarchy of alternatives’:
“Obviation of demand is often environmentally and socially better than providing for demand or rationing consumption through price or limited capacity... . Obviation is not the same thing as

¹⁴³ See footnote on page 10 <http://m4newport.com/assets/issue-m4-sea-environment-report---publication---c2.pdf>

restricting or thwarting demands which may simply lead to the displacement of a problem: it is better seen as looking for different, more sustainable, means to achieve human quality of life ends”¹⁴⁴.



46. Obviation of the proposal has not been properly considered because the ‘problems’ have not been reassessed and the goals of the plan or programme are therefore invalid.
47. We consider the Welsh Government to have failed to take adequate consideration of factors that should have led to a reassessment of the objectives of the plan or programme.
48. We also consider that the Welsh Government has failed to take consideration of its own guidance in not making efforts to consider whether or not the preferred plan is necessary through failing to reappraise the problems since at least 2007.
49. The significance of this failure of the Welsh Government to reassess the problems cannot be overstated. If there is no evidence for many of the problems, or if they can be alleviated by means other than the proposed motorway, then the whole planning process adopted by the Welsh Government is fundamentally flawed. The SEA is invalid.
50. If the problems have been discredited it follows that the objectives of the plan or programme are contested. But given that both the objectives of the plan or programme are contested and: *“SEA objectives are used to help show whether the objectives of the plan or programme are beneficial for the environment”*¹⁴⁵, it is logical to conclude that the SEA objectives may not be asking the correct questions of the plan or programme. In short, the SEA objectives are invalid because the Welsh Government has failed to substantively update the ‘problems’ and therefore the objectives since at least 2007.

¹⁴⁴ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf pages 68-69

¹⁴⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf page 28

51. This lies at the heart of the common law argument that a decision maker must “ask themselves the right questions”.
52. The entire basis of problems on which the Welsh Government’s M4 plans is based is legitimately disputed, yet the public had no opportunity to challenge them because they were generated prior to public consultation.
53. If the objectives are nine years out of date and were never themselves subject to public consultation, they may well be entirely the wrong objectives to deal with problems which themselves may be flawed.
54. The Welsh Government has asked itself the wrong questions, and this is the crux of the problem that now faces us: the wrong answers.

CO2 emissions/speed

55. The Welsh Government states:
*“The forecast traffic volume increases along the M4 would contribute not only to poor air quality, but also noise pollution, compromising the amenity of neighbouring residential communities. Assuming no improvements to vehicle emissions technology, increased flows and stop start conditions would give rise to more vehicle emissions along these routes. It is important to note that stop-start congested traffic can result in higher CO2 emissions than free-flowing traffic”*¹⁴⁶.
56. But as Friends of the Earth Cymru has repeatedly pointed out, emissions are relatively insensitive to speed from 40-60mph¹⁴⁷ but are lowest at about 45mph. A similar emissions profile is available in a report for the European Environment Agency¹⁴⁸.
57. In particular, we would direct attention to the conclusion of this research that notes:
*“If moderate congestion brings average speeds down from a freeflow speed of about 65 mph to a slower speed of 45 to 50 mph, this moderate congestion can actually lower CO2 emissions. If relieving congestion increases average traffic speed to the free-flow level, CO2 emission levels will go up. Extremely high speeds beyond 65 mph can cause an adverse effect on CO2 emissions. If these excessive speeds can be controlled, there will be not only direct safety benefits but also indirect benefits of CO2 reduction”*¹⁴⁹.
58. So it is only below about 45mph that congestion starts to increase CO2 emissions, and emissions at 30mph are about the same as those at 70mph. In fact, **emissions are reduced as a result of congestion** where it brings average speeds down to as low as 45mph. This brings one of the central tenets of the Welsh Government’s consideration of greenhouse gas emissions – that any reduction

¹⁴⁶ <http://m4newport.com/assets/the-plan---english.pdf> page 19

¹⁴⁷ University of California Transportation Center, 2009, [Traffic congestion and greenhouse gases](#)

¹⁴⁸ Mellios et al., 2011, [Projection of CO2 emissions from road transport](#), p.15

¹⁴⁹ Barth and Boriboonsomsin, 2010, [Real-world carbon dioxide impacts of traffic congestion](#)

in congestion contributes to a net reduction in CO2 emissions – into disrepute. This has a further important bearing on the conclusions reached by WelTAG, which do not appear to be based on empirical evidence.

59. In any case, the statement “slow and congested traffic can result in higher CO2 emissions than free-flowing traffic” is meaningless in the context of this document because no robust average speed measurements have been provided. The document should also, for objectivity, note that “free-flowing traffic can result in higher CO2 emissions than slow and congested traffic”.
60. Additional traffic is generated by increased road capacity¹⁵⁰.
61. The best comparator available from the DfT is the A46 Newark-Widmerpool Improvement because this is a new piece of infrastructure that runs alongside a pre-existing A46. In this example, an additional 33 miles of lane capacity led to an increase in CO2 emissions of 28,938 tonnes in the first year, or 877 tonnes CO2 per mile.
62. The preferred route for the M4 around Newport is a 14 mile motorway of three lanes in each direction. So the additional lane capacity is 84 miles. **We might reasonably expect the increased CO2 emissions associated with traffic using this motorway to be at least the equivalent of 28 miles of new carriageway, or a minimum 24,556 tonnes CO2 extra per annum.**
63. It is also worth noting that the Welsh Government confirmed on 10 September 2016 – six days prior to publishing the SEA document – that “no calculations of air pollution are available” as a result of forecast traffic volumes¹⁵¹.

Alternatives

64. The Welsh Government claims that:
“To meet the requirements of a ‘Reasonable Alternative’, appraisal must demonstrate that the alternative could reasonably deliver the objectives of the draft Plan. It is the responsibility of the Welsh Government, as the Responsible Authority, to determine which options will reasonably deliver the objectives of the draft Plan”¹⁵².
65. Yet that is not what the SEA Directive requires. The Directive states 5(1) that:
“an environmental report shall be prepared in which the likely significant effects of the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated”.
It does not state that the reasonable alternatives must “reasonably deliver the objectives”, but that reasonable alternatives must be identified, described and evaluated “taking into account the objectives and the geographical scope of the plan or programme”.

¹⁵⁰ <http://www.vtqi.org/gentraf.pdf>

¹⁵¹ Letter from the Welsh Government to Friends of the Earth Cymru, 10 September 2013

¹⁵² <http://m4newport.com/assets/sea--post-adoption--statement.pdf> page 49

66. The Welsh Government appears to consider Friends of the Earth Cymru not to have proffered any alternatives¹⁵³, despite sections 97-120 (and specifically 118) of our response referring to reasonable alternatives.
67. Furthermore, the Welsh Government has shown that the *partial* closure of just one motorway junction could result in a 5% reduction in peak traffic through the Brynglas Tunnels (widely regarded as the most restricted point on the M4 around Newport)¹⁵⁴.
68. Despite Friends of the Earth Cymru having raised this with the Welsh Government, no mention of it has been made in the Plan. It does not appear to have been mentioned by the Welsh Government since July 2011.

¹⁵³ <http://m4newport.com/assets/strategic-appraisal-of-alternative-options.pdf>

¹⁵⁴ <http://www.m4cem.com/downloads/reports/M4%20CEM%20Stakeholder%20Workbook.pdf> page 33