

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



Llywodraeth Cymru
Welsh Government

Magor Service Area objections

Objection Refs OBJ0026 (Roadchef) & OBJ0292 (Rontec)

File Refs WG/REB/OBJ0026+OBJ0292-SB

**Response to Objectors' Evidence: Roadchef – Economic Aspects
(Supplementary Evidence of Mr Axon and Dr McKay)**

1.	Author	3
2.	Response	4
3.	SCHEME REBUTTAL	5
	3.1. Evidence of Mr Mike Axon	5
	3.1. Evidence of Mr Henry Church	11
4.	ALTERNATIVE ROUTE PROPOSALS	13
	4.1. Transport Economic Efficiency	13
	4.2. Wider Economic Impacts	14

1. AUTHOR

- 1.1 I am Stephen Bussell. I am an Associate of Ove Arup and Partners Ltd (Arup), a multi-disciplinary consultancy. My professional qualifications are set out in my main proof of evidence and are not repeated here.

- 1.2 The evidence which I have prepared and provide in this response is true and I confirm that the opinions expressed are my true and professional opinions.

2. RESPONSE

- 2.1.1. This proof of evidence addresses matters raised by objectors concerning the rest area or motorway service area at Magor just off junction 23A of the existing and proposed new motorway.
- 2.1.2. Roadchef and Rontec have submitted Statements in Evidence in relation to the draft statutory Orders associated with the Welsh Government's proposals for the M4 Corridor around Newport (the Scheme), which has been received via the Programme Officer.
- 2.1.3. The evidence of Roadchef and Rontec is provided in several volumes from different witnesses as follows:
- i. Mr Simon Turl, Roadchef (OBJ0026) - – Main and Supplementary evidence dated February and June 2017
 - ii. Dr Ian McKay, Roadchef (OBJ0026) - – Main and Supplementary evidence dated February and June 2017
 - iii. Mr Mike Axon, Vectos, on behalf of Roadchef (OBJ0026) – Main and Supplementary evidence dated February and June 2017
 - iv. Mr Henry Church, CBRE, on behalf of Rontec (OBJ0292)
- 2.1.4. I have responded to the proof of evidence of Mr Turl in my separate rebuttal proof of evidence document.
- 2.1.5. This evidence will respond to the points raised in the evidence of Roachef's other witnesses where it relates to economic aspects of the M4CaN Scheme and proposed alternatives.
- 2.1.6. Aspects of my evidence interface with the evidence of other witnesses including Matthew Jones (WG1.1.1, WG 1.1.6), Bryan Whittaker (WG1.2.1, WG 1.2.6) and Ben Sibert (WG1.5.1, WG1.5.6).
- 2.1.7. My evidence is presented in the following structure:
1. Author
 2. Response
 3. Scheme Rebuttal:
 4. Alternatives Rebuttal.

3. SCHEME REBUTTAL

3.1. Evidence of Mr Mike Axon

Access arrangements and turn-in rates

3.1.1. In Figures MAS 2 and MAS 3, Mr Axon presents charts showing the turn-in rates for 'on-line' and 'junction' service areas. As set out in my response to Mr Turl's evidence, the distinction drawn in Roadchef's evidence between these two types of service area is, in my view, overly simplistic and does not provide a basis for drawing conclusions in respect of the relationship between turn-in rates and access arrangements. I do not repeat these arguments here but refer to Section 2.4 of my rebuttal proof of evidence relating to Mr Turl's evidence.

3.1.2. Mr Axon includes in Figures MAS 2 and MSA 3, the turn-in rates he thinks will be realised in the future based on Mr Turl's assumptions for the reduction in eastbound and westbound customers. For the reasons set out Section 2.5 to 2.7 in my response to Mr Turl, these turn in rates are incorrectly calculated and exaggerate the impact of the Scheme.

Driver Behaviour, the M4CaN Transport Model and Economic Appraisal

3.1.3. Mr Axon makes a number of criticisms of the M4CaN Transport Model on the basis that people do not make travel decisions on a mathematical time and cost basis (paragraph 2.2). Professor Pickup (Appendix MAS 2) makes a general criticism of approaches to transport modelling. He suggests that: *'Whilst transport models provide useful rules of thumb for strategic planning purposes, their behavioural assumptions are increasingly being called into question. As you know – the tail is essentially wagging the dog when it comes to planning decision making.'*¹

3.1.4. Behavioural economics is not a 'new field' as Professor Pickup suggests and these are not recently discovered insights. Behavioural economics points out that people are not entirely rational and that the way in which people make decisions does not always align with economic theory.

3.1.5. The debate between behavioural economics and 'mainstream' economics goes something like this: economists develop models to predict the effects of changes in interest rates on mortgage applications; behavioural scientists

¹ Paragraph 2. Letter from Professor Pickup (Appendix MAS 2)

point out that the relationship between interest rates and mortgage applications is complex and that people do not always respond rationally to interest rates (for example, people have a tendency towards inertia – termed ‘status quo’ bias – and may remain on an expensive policy for some time even when cheaper policies are available); behavioural scientists undertake experiments under laboratory conditions in which they ask people to choose between different options and observe that sometimes people choose an option which is sub-optimal; economists point out that that, empirically and when viewed in aggregate, whenever interest rates fall mortgage applications rise.

- 3.1.6. This is similar to the debate in transport modelling. Behavioural economists point out that people’s transport decisions are complex and subject to a range of biases. Behavioural scientists use laboratory experiments (similar to that given in Appendix B of Professor Pickup’s letter – LP Appendix B²) to demonstrate that people find it difficult to accurately calculate time and distance. However, if we observe people’s behaviour on the transport network, in general and in aggregate, we see that drivers seek to minimise their generalized costs of travel. Such behaviours are re-enforced by route finders (e.g. google maps) and Satellite Navigation devices.
- 3.1.7. Despite the research in behavioural economics, Government guidance (WebTAG) continues to recommend that transport schemes are assessed using models based on responses to changes in generalized costs of travel (which are in turn based on time and distance)³. The valuation of travel time savings (the way in which travelers trade off time and costs) used in both modelling and appraisal is based on values prescribed by WebTAG⁴.
- 3.1.8. It is also noteworthy that the paper appended to Professor Pickup’s letter (LP Appendix A, ‘Mindsets – Chapter 1; The Economics Approach to Mobility’) does not recommend an alternative approach. In respect of the validity of conventional cost-benefit analysis the paper considers two alternative approaches (Prospect Theory and Subjective Well-Being). On Prospect Theory it concludes *‘the jury is still out on whether Prospect Theory is really superior to its alternatives’*. On subjective well-being it concludes *‘subjective*

²² Driver Route Choice Behavior: Experiences, Perceptions and Choices

³ Section 4.2.4. Unit M1.1 (Principles of Modelling and Forecasting)

⁴ Section 4 – Values of Travel Time Savings. Unit A1.3 (User and Provider Impacts)

*well-being seems to suffer from limitations that are quite similar to those of traditional economic welfare assessments*⁵.

- 3.1.9. In respect of the implications for transport simulation and forecasting, the paper concludes: *'as far as transport planning goes, we tend to agree with de Moraes Ramosa et al. (2014) that it currently still provides the best framework for travel demand simulation and forecasting'*⁶. With that in mind the continued reliance on generalised costs models in Government Guidance is readily understandable.

Driver Behaviour and Decisions to Stop at the Service Area

- 3.1.10. It is not clear how Roadchef has applied its own evidence on behavioural psychology to the problem in hand. Despite Mr Axon's assertion that time and cost are often minor factors in pre-trip and on-trip decisions, in the Harris Research, respondents have been presented with a scenario based on a change in the distance they would have to travel in order to visit the Service Area. If distance were not important and if *'simplicity were the governing factor'*⁷ (as Professor Pickup suggests) it would make no sense to pose this question to customers.
- 3.1.11. Neither Mr Axon nor Professor Pickup provide sufficient detail as to how the psychological factors which they identify will apply to the specific characteristics of the proposed access and egress arrangements. Professor Pickup is quite open about this. He states: *'I cannot of course consider the specifics details of the Scheme design'*⁸. Yet, Professor Pickup is sufficiently confident to assert that *'the effect of the M4 Published Scheme will be many less people making the decision to visit the MSA'*⁹. I do not understand how Professor Pickup has been able to form a conclusion, consistent with his theories, if he has not considered the specific details of the Scheme design.
- 3.1.12. Mr Axon states that *'continuous movement is preferred, rather than stop/start, even where journey time is increased'*¹⁰. In this respect, the proposed westbound arrangements (which provide a free flow connection to Junction 23a for access to the Service Area, and a free flow connection via the existing

⁵ Section 6.2 – Validity of conventional cost-benefit analysis. Mind-Sets Chapter 1 (LP Appendix A)

⁶ Section 6.3 – Implications for transport simulation and forecasting. Mind-Sets Chapter 1 (LP Appendix A)

⁷ Paragraph 7. Appendix MSA 2

⁸ Paragraph 1. Appendix MSA 2.

⁹ Paragraph 20. Appendix MAS 2.

¹⁰ Section 2.2. Supplementary Evidence of Mr Axon.

M4 back to the motorway on egress) would be preferred to the eastbound access and egress arrangements.

- 3.1.13. Neither Professor Pickup nor Mr Axon clearly set out how psychological factors will apply differently to first time visitors and those who have prior knowledge of the access arrangements. This contrasts with the evidence of Mr Henry Church (Rontec) who states that: *'Whilst first time and occasional users may continue to use Magor MSA it is my client's view that regular traffic will seek to avoid using the MSA whenever possible because of the length of access and egress and regardless of signage.'*¹¹ Roadchef has identified that 67.5% of vehicles entering the Service Area in 2016 did so only once and, as such, would presumably be categorised as occasional visitors¹². Evidence from the Harris Research is that 40% of visitors are first time visitors (have never visited the Service Area before)¹³. If Mr Church is right, the suggested 80% reduction in westbound turn-ins (adopted by Mr Axon) cannot be correct.
- 3.1.14. Mr Axon presents the issue as if people's decisions about whether to stop are wholly based on perceived convenience. He does not make clear that there are other factors that determine the attractiveness of the Service Area which will also influence driver decisions. In paragraph 2.4.5 of my rebuttal proof of evidence to Mr Turl's evidence, I have listed a range of characteristics which influence turn-in rates alongside access arrangements.
- 3.1.15. In respect of the attractiveness of the Service Area, it should also be recognized that cognitive biases apply in other ways which might act to discourage a customer from choosing not to stop at Magor. For example, 16% of customers responding to the Harris Research, when asked why they chose to stop at Magor replied *'habit – it is one of the regular service stations I use'*¹⁴. A further 13% said that the *'brand of restaurant or shop I prefer to use'* was the reason for stopping, whilst 10% cited that they stopped at Magor because it is *'the first service station in Wales'*. It is entirely feasible that some of these customers will continue to use the Service Area in the future irrespective of rational calculation of time and cost.
- 3.1.16. Crucially, neither Mr Axon nor Professor Pickup consider how driver responses will differ depending on the purpose of their stop. I agree with Mr

¹¹ Section 3.9. Main Proof of Evidence of Mr Church

¹² Section 5.2. Main Proof of Evidence of Mr Turl

¹³ Page 27 (Question 12) of Appendix 1 to the Main Proof of Evidence of Mr Turl.

¹⁴ Page 28 (Question 12). Appendix 1 to the Main Proof of Evidence of Mr Turl.

Axon that the access and egress arrangements are less direct than at present and that this will have some detrimental impact on the number of visitors to the Service Area. However, whether an individual decides to stop at the service area in the future will depend on a range of factors including the drivers' prior knowledge of the service area and its access arrangements, the characteristics of the service area itself (its facilities and attractiveness) and the purpose of the visit in question.

3.1.17. Whether the purpose of any individual's use of a service area is 'necessary' or 'discretionary' is not a binary quality. However, it is a useful distinction when considering how the changes in access arrangements will affect different customers. Where a driver is considering making a discretionary stop, it is quite feasible (as is the case today) that he or she will weigh up the utility he/she perceives they will get from the visit against the dis-utility of extending their travel time or cost, as well as any other perceived inconvenience of using a service area. Therefore, the turn-in rate will be lower as a result of the Scheme. However, where a driver is making a necessary stop – for example, in order to take a break or to refuel – they will continue to be able to do so.

3.1.18. As a general point, I would agree with Mr Axon that there may be psychological aspects of any trip which mean that users will perceive a minutes travel time (or a 1 km distance) differently depending on factors such as traffic conditions and the need to pass through junctions. However, Mr Axon fails to acknowledge the availability of a free flow connection to Junction 23a; he then concludes that the proposed access arrangements will mean that drivers will fail to stop when they are tired. To the degree that they have prior knowledge of the access arrangements, in my opinion, drivers will weigh up their need to stop against any additional inconvenience they will suffer.

3.1.19. I agree that there will be a reduction in the proportion of passing vehicles using the Service Area. However, whether people continue to stop or not will depend on the purpose of their visit to the Service Area and, under the Published Scheme, the Service Area will continue to be available to those who want or need to stop.

Driver Behaviour and Impacts on Turn-In Rates

3.1.20. Mr Axon has criticized the Welsh Government for not employing a '*social scientist or behavioural psychologist*' to help understand the impact of the proposed access arrangements. Yet, neither Mr Axon nor Professor Pickup is

able to provide an estimate of the impact of the Scheme on turn-in rates. Mr Axon states that *'a major proportion of travelers that may have been attracted to the MSA if it conformed to the norm would now not be'*¹⁵. However, nowhere does Mr Axon state what he considers to be the norm, nor is he able to state the impact of the Scheme.

- 3.1.21. As noted, Professor Pickup states that *'the effect of the M4 Published Scheme will be many less people making the decision to visit the MSA'*. He does not quantify the reduction. Nor does he have a view as to how responses will vary according to the purpose of their visit.
- 3.1.22. Having sought the advice of Professor Pickup, Mr Axon relies wholly on Mr Turl to provide an estimate of the impact of the Scheme on the propensity of drivers to visit the Service Area. Mr Turl is not a social scientist or behavioural psychologist. Mr Turl's assessment of the impact of the Scheme appears to have been made without the assistance of a behavioural psychologist. Mr Turl has not set out how his assessment takes into account research in the field of behavioural economics. Indeed, his disinclination to regard access and egress as separate decisions, Mr Turl fails to follow Professor Pickup's approach. His conclusions regarding the impact of the Scheme were published in his Proof of Evidence dated 7th February 2017, well in advance of Professor Pickup's letter of the 20th June 2017.
- 3.1.23. In point 7 of Mr Axon's conclusions he states: *'I am advised by Roadchef that in the absence of a westbound slip road the propensity for westbound travelers to call in at the MSA will be 80% lower than the norm for an MSA served directly from a motorway junction.'*¹⁶ As an aside, this statement does not accurately represent Mr Turl's evidence. Mr Turl has stated that there would be an 80% reduction in the turn-in rate for westbound traffic and makes no judgment about how this relates to the *'norm for an MSA'*. Roadchef's data on turn-in rates demonstrates that turn-in rates vary greatly and there is no such thing as a normal turn-in rate.
- 3.1.24. In point 8 of Mr Axon's conclusions, referring to Mr Turl's estimates, he states: *'There is no better data'*. In my response to Mr Turl I set out why I consider Mr

¹⁵ Section 2.7. Supplementary Proof of Evidence of Mr Axon.

¹⁶ Section 7.3. Supplementary Evidence of Mr Axon.

Turl's analysis to be flawed and inconsistent with Roadchef's own customer research.

3.1.25. In section 6.19 of his supplementary evidence, Mr Axon states: '*Stephen Bussell (SB) says that the inclusion of the slip road avoids the need for eastbound travellers to access the MSA via Junction 23 and thereby substantially improves the ease of access to the MSA. SB's judgement that the difference the slip road makes is 'substantial' presumably draws on much more than a simple time and cost analysis.*'

3.1.26. My conclusion that access is substantially improved by the eastbound off-slip is based on the fact that the additional travel times and distances (i.e. stopping versus not stopping) incurred by users of the Service Area would be substantially reduced as a result of the off-slip. I also take into account that there might have been some psychological discouraging effect (under the previously proposed arrangements) for users due to travelling in the opposite direction to their through trip for some distance. I note also, that given the option for westbound users to egress the service area via the existing M4, users will be able (if they prefer) to continue their trip in a westbound direction without a similar discouraging effect. My opinions therefore are not solely based on time-cost analysis.

Severn View Service Area

3.1.27. I have stated that Severn View service area is unlikely to be a good substitute for Magor Service Area. This conclusion is based on the fact that, should a user be sufficiently time constrained that they will choose not to stop at Magor in the future (under the proposed access arrangements) neither are they likely to consider Severn View Service Area to be an attractive alternative. This is not the same as saying that users who need to stop (and who cannot delay their stop) will not be willing to stop at Magor Service Area, or indeed Severn View.

3.2. Evidence of Mr Henry Church

3.2.1. In his main proof of evidence Mr Church states that '*I am advised that a drop in throughput at the MSA puts viability at risk.*'¹⁷ Rontec's objection to the draft Supplementary CPO states that '*Rontec are currently compiling survey information which will assess the extent to which the MSA PFS is*

¹⁷ Section 3.10. Main Proof of Evidence of Mr Church.

*economically dependent on through traffic and whether it will remain viable under both the original and amended Schemes*¹⁸. We have requested a copy of the survey but this has not been provided. It is not clear how this analysis will take into account the fact that Roadchef believes that the Service Area will continue to be a profitable business once the Scheme is delivered.

- 3.2.2. In his main proof of evidence, Mr Church provides no evidence of the impact of the Scheme on the number of customers using the filling station in order to support Rontec's assertion that it may be forced to close.
- 3.2.3. In my rebuttal proof of evidence to Mr Turl's evidence I have set out evidence on why I consider that the filling station will continue to remain financially viable under the Welsh Government's proposals. This includes evidence on the degree to which the filling station and services building is dependent on through traffic.

¹⁸ Letter from Rosenblatt to Welsh Government (9 May 2017)

4. ALTERNATIVE ROUTE PROPOSALS

4.1. Transport Economic Efficiency

4.1.1. From an economic standpoint, the primary measure of the value for money of alternatives is the benefit-cost ratio (BCR). Table 1 sets out the BCRs for each alternative as compared with the Welsh Government's proposals.

Table 1 - Value for Money of Roadchef Alternatives

Proposal	Benefit-Cost Ratio (Initial BCR)
Published Scheme (supplementary orders) ¹⁹	1.65
Suggested Alternative 8	1.62
Suggested Alternative 9	1.37
Suggested Alternative 10	1.63
Suggested Alternative 11	1.65

4.1.2. Alternative 9 shows a BCR substantially lower than the Published Scheme and would therefore offer significantly lower value for money.

4.1.3. Alternatives 8 and 10 would provide a free flow link between the existing reclassified M4 and the motorway in an eastbound direction which would benefit some users. Alternative 10 is the better performing free-flow option in respect of the economic appraisal. The BCR for this option is similar to, but slightly lower than the BCR for the Published Scheme.

4.1.4. Option 11 involves a relatively minor change in traffic and economic terms and has a BCR equivalent to the Published Scheme. From the standpoint of the economic efficiency of the transport network, there is no clear preference between this option and the Published Scheme.

4.1.5. My overall opinion regarding the Roadchef suggested alternatives is that none of the proposed alternatives would enhance the value for money of the Scheme compared to the Published Route.

¹⁹ To ensure comparability with objector's alternatives, the BCR given for the Published Scheme excludes accident impacts and impacts during maintenance and construction.

4.2. Wider Economic Impacts

- 4.2.1. Alternatives 8, 9 and 10 – by providing a free flow link for eastbound traffic on the reclassified existing M4 to the motorway – offers some advantages over the Published Scheme in respect of strategic long distance traffic movements. I also recognise that – as compared with the Published Scheme – each of the alternatives would provide improved access to the Service Area as well as being of benefit to firms located at the Wales One business park. Relative to the Published Scheme, the Roadchef alternatives would lead to a better commercial outcome for the Service Area which could, in turn, translate into a higher level of employment. As I set out in the rebuttal proof of evidence to Mr Turl's evidence, I consider the level of employment at the Service Area to be a localised economic benefit.
- 4.2.2. The benefits of the alternatives would also need to be weighed against the negative impact of any delay to the delivery of the M4CaN Scheme and the substantial and wide ranging economic benefits (detailed in the Revised Wider Economic Impact Report) that would be foregone as a result. I understand that the economic costs of any delay is a key concern of the Welsh Government in respect of alternatives.