

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



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Llywodraeth Cymru  
Welsh Government

**This document is an update to the ‘Proof of Evidence – Carbon’ document WG 1.13.1. It contains a scheme evidence update following the recent Department for Transport announcement that tolls on the Severn Crossings will be removed by the 31<sup>st</sup> December 2018.**

### **Scheme Evidence Update**

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**Welsh Government, Carbon**

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**1. AUTHOR**

- 1.1 I am Tim Chapman. I am a Director of Ove Arup and Partners Ltd (Arup), a multi-disciplinary consultancy, where I lead the Infrastructure London Group and sit on Arup's UK Infrastructure Sector Executive. My professional qualifications are set out in my main Proof of Evidence (WG 1.13.1) and are not repeated here.
- 1.2 The evidence which I have prepared and provided in this Scheme Evidence Update has been prepared and is given in accordance with the Code of Conduct of the Institution of Civil Engineers and I confirm that the opinions expressed are my true and professional opinions.

## **2. SCOPE AND PURPOSE OF THIS SCHEME EVIDENCE UPDATE**

- 2.1 This Scheme Evidence Update provides an update to my previous evidence (WG 1.13.1) with respect to the Scheme Carbon Assessment due to the recent announcement from the DfT that the Severn Crossing Tolls will be removed from 31<sup>st</sup> December 2018.
- 2.2 My Scheme Evidence Update is presented in the following structure, with a detailed contents provided at the start of the document.
1. Author
  2. Scope and Purpose of this Scheme Evidence Update
  3. Scheme Evidence Update
  4. Conclusion

### **3. SCHEME EVIDENCE UPDATE**

#### **3.1. Severn Crossing Tolls**

- 3.1.1. In my previous evidence, I compared the carbon impact of the Do-Minimum and the Do-Something scenarios based on the VISSIM traffic model results. The traffic model assumed a half toll scheme for both scenarios. Following the recent announcement that the Severn Crossing Tolls will be removed, my qualitative assessment of the carbon impact is as follows:
- 3.1.2. Mr Whittaker's evidence confirms a highly likely increase in traffic on the M4 around Newport, given the removal of the Severn Crossing Tolls, irrespective of whether the corridor around Newport is improved or not.
- 3.1.3. However, the increased traffic from the toll removal would exacerbate the current problems in a Do-Minimum scenario. Compared with the previously assumed half toll condition, the existing road should likely experience even greater congestion, with even less reliable journeys and potential increase in incidents, while the journey travelled is still longer than the proposed Scheme.
- 3.1.4. For the Do-Something scenario, the new M4 will still be free-flowing with the increased traffic, with reduced likelihood of incidents, while the journey travelled is reduced (due to the shorter road). The greater volume of traffic under the No-Toll scenario is likely to result in an even greater beneficial difference in User Carbon between Do-Minimum and Do-Something compared to the half toll condition previously analysed (as was apparent with the VISSIM calculation under the half tolls scenario when comparing 2022 and 2037)
- 3.1.5. Overall therefore, I would expect that in the case of the Severn Crossing Tolls being removed, the creation of the new M4 should be even more beneficial in carbon reduction terms compared to the previous assessment based on half tolls.

- 3.1.6. In the longer term, although the traffic benefit from the new Scheme will likely still apply, qualification of carbon difference from Do-Minimum is more difficult, due to vehicle electrification and potential changes in modal share.
- 3.1.7. I believe that the qualitative assessment of carbon I have presented here is correct. I understand that the SATURN model may be re-run to refine the transport effects of removing tolls on the Severn Crossing. While that model is the conventional way to assess new trip dispositions, it alone is not effective at working out the carbon effects of such trips, as it assigns average speed conditions at all times and hence takes no account of the carbon effects of stop-start traffic. Its direct results on carbon will be misleading, as it does not account for the detrimental carbon impact of congestion. As my main evidence already demonstrated, a micro-simulation model like VISSIM would be able to accurately represent the carbon impact of congestion; but there is insufficient time for such a model to be run.

## **3.2. Electric vehicles**

- 3.2.1. Recently the Government announced that the sale of diesel and petrol cars will be banned from 2040. The impact which that announcement will have on the uptake of electric vehicles in the UK cannot be quantified at this stage though in my view it may well accelerate the uptake which is predicted in the current version of WebTAG (which has not been updated). The announcement only relates to cars and not to other vehicles and larger vehicles e.g. coaches, vans and HGVs are likely to remain diesel-dependent in the medium term. Furthermore, it should be noted that in the short term EVs will continue to derive much of their power from combustion of gas in the main power stations and will only become low carbon when the electricity grid has been decarbonised. All other things being equal acceleration of the uptake of EVs will put back the date for carbon neutrality. That, however, would be a positive development in terms of

climate change because it would mean that the carbon footprint of road transport would have declined generally.

- 3.2.2. In my previous evidence I pointed out that the date for carbon neutrality was conservative because (i) it took no account of the likely User Carbon savings on the wider network and (ii) it did not take account of the reduction in congestion producing incidents which would result from the Scheme. A third factor which results in the date being conservative is the change from a half toll to no tolls for the reasons I explain in this proof of evidence. However greater than previously anticipated uptake of EVs would tend to postpone the date for carbon neutrality. Nevertheless, having regard to all factors I consider that the carbon neutrality date remains conservative.

#### **4. CONCLUSION**

- 4.1 My qualitative assessment on the removal of the Severn Crossing Tolls is that the benefit of the new Scheme in terms of carbon savings is likely to be greater than in the half toll scenario previously considered.
- 4.2 My qualitative assessment on the eradication of internal combustion engine car sales in 2040 is that it is likely to increase the uptake of EV vehicles above that which is anticipated in the current version of WebTAG. In terms of arresting climate change that would clearly be a positive development, provided that commitment to decarbonise the electricity grid are also maintained. It is not possible at this stage to meaningfully quantify the extent to which emissions will be reduced by greater uptake of EVs. Taken in isolation greater uptake of EVs earlier will postpone the date for carbon neutrality. Having regard, however, to other factors which are not taken into account in my calculation I remain of the view that the calculated carbon neutrality date in my main evidence is conservative and that the Scheme will contribute positively to meeting Welsh carbon targets for 2030, 2040 and 2050.