Adran Seilwaith yr Economi
Department for Economic Infrastructure

Llywodraeth Cymru
Welsh Government

THE LONDON TO FISHGUARD TRUNK ROAD (A40) (LLANDDEWI VELFREY TO PENBLEWIN IMPROVEMENT AND DE-TRUNKING) ORDER 201-

THE LONDON TO FISHGUARD TRUNK ROAD (A40) (LLANDDEWI VELFREY TO PENBLEWIN IMPROVEMENT) (SIDE ROADS) ORDER 201-

THE WELSH MINISTERS (THE LONDON TO FISHGUARD TRUNK ROAD (A40) (LLANDDEWI VELFREY TO PENBLEWIN IMPROVEMENT)) COMPULSORY PURCHASE ORDER 201-

SUMMARY PROOF OF EVIDENCE

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WELSH GOVERNMENT, TRAFFIC & ECONOMICS

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1. Author

1.1 My name is Philip Thiele. I am a Senior Engineer within the Transport Consulting sector at Ove Arup and Partners Ltd (Arup).

1.2 I am a Chartered Engineer and a member of the Institution of Civil Engineers (ICE). I have over 14 years' experience in the field of transport modelling carrying out and leading strategic modelling projects in both the public and private sectors.

1.3 I have led the development of the strategic traffic model and economic appraisal for the A40 Llanddewi Velfrey to Penblewin Improvements (the "Scheme"). The opinions that are expressed in my Proof of Evidence are my own.

2. Scope and Purpose of this Proof of Evidence

2.1 In this Proof of Evidence, I provide a summary of key aspects of the traffic data analysis, traffic modelling and economic appraisal that has been undertaken for the Scheme.

2.2 Throughout my evidence, I will refer to guidance on transport appraisal provided by both the Welsh Government (WelTAG) (Doc. 4.01.11) and the UK Department for Transport (WebTAG) (Doc. 4.01.69).

3. Existing Conditions

3.1 The A40 between St Clears and Haverfordwest is a relatively poor-quality route. The section passing through the village of Llanddewi Velfrey is particularly narrow and a speed limit of 40mph applies. Problems identified include severance, air and noise concerns and safety issues.

3.2 The following traffic related issues were identified in the 2017 WelTAG Study (Doc. 4.03.07):

a) Limited and inconsistent overtaking opportunities, which lead to journey time unreliability, driver frustration and associated risky manoeuvres with severe collision incidents;
b) Platooning (when there are convoys of heavy goods vehicles from the ferry ports and slow-moving agricultural vehicle accessing the many side roads and farm accesses along the A40) contributes to journey time unreliability when combined with the limited overtaking opportunities and mix of local and HGV traffic;
c) The route of the A40 passes through the populated area, creating severance and air and noise pollution problems within the local community at Llanddewi Velfrey; and
d) Slow-moving traffic during the summer months exacerbates the problems, with tourists causing a significant increase in total traffic and slow-moving vehicles including those towing caravans.

3.3 Figure 1 in Appendix A (WG 1.2.3) shows the hourly traffic flow profile on the A40.

3.4 Figure 3 in Appendix A (WG 1.2.3) shows that traffic volumes in August are 26% higher than the annual average daily traffic (AADT), whereas volumes in January are 20% lower.

3.5 The average vehicle split throughout the day is 74% cars, 18% LGV and 8% HGV as shown in Figure 5 in Appendix A (WG 1.2.3).

3.6 An analysis of operational conditions indicates that the road and junctions have sufficient capacity to accommodate the traffic demand. However, comparisons of journey times indicate that there is some congestion during daytime hours, with journey times increased by 15% to 17% compared to night time hours. The cause of this are slow-moving vehicles and a lack of overtaking opportunities.

4. Overview of Strategic Model

4.1 The traffic model represents typical operating conditions on the highway network in terms of average hourly flows and speeds on a normal weekday of operation during a 'neutral period' of the year. It has been developed in compliance with WebTAG (Doc. 4.01.69).

4.2 An assessment of the need for variable demand modelling was undertaken in accordance with WebTAG (Doc. 4.01.69). This confirmed that a 'fixed trip matrix' approach is appropriate for the Scheme. It indicates that there would be no induced traffic resulting from the Scheme.

5. Base Year Traffic Model

5.1 The base year model represents October 2016. The hours represented in this traffic model are 08:00 to 09:00 for the AM peak, an average of the hours between 10:00 and 16:00 for the inter-peak and 17:00 to 18:00 for the PM peak.

5.2 The trip matrices containing travel demand were derived based on a roadside interview survey undertaken on the A40 in 2016.

5.3 The model calibration and validation processes are described in the Local Model Validation Report (Doc. 4.05.02). The validation confirms that the model is representative of real conditions and therefore forms a robust basis for forecasting.

6. Traffic Forecasting

6.1 A set of Do Minimum (without the Scheme) and Do Something (with the Scheme) traffic forecast scenarios has been developed for three future years in accordance with WebTAG (Doc. 4.01.69).

6.2 The three future years are the year of Scheme opening, 2021, a design year of 2036, and a 'horizon year' of 2051.

6.3 There are no proposed developments that require specific inclusion in the traffic model. Traffic growth projections for car trips were therefore based directly on the National Trip End Model (NTEM). Goods vehicle traffic growth was based on Road Traffic Forecasts 2018 (RTF18).

6.4 Traffic growth data shows that, relative to 2016, traffic levels are expected to be broadly 22% higher by 2036 and 34 to 35% higher by 2051.

6.5 Forecast traffic flow figures based on central traffic growth projections are included in Appendix C (WG 1.2.3). In the design year (2036) the AADT passing through Llanddewi Velfrey is forecast to reduce by 96% from 13,780 to 520 vehicles as a result of the Scheme.

6.6 Operational analysis in future years shows that the A40 through Llanddewi Velfrey would reach a 'stress factor' of 0.74 by 2051. Based on this the road would be expected to operate under free-flow conditions and journey time reliability issues are expected to be marginal.

6.7 However, the CRF analysis does not capture the impact of slow-moving HGVs, agricultural vehicles, campervans or towing vehicles on other road users. Observations in the base year confirm that road users are, at times, held up behind slow-moving vehicles and the occurrence of this would become more frequent as travel demand rises in future.

6.8 Car journey time savings resulting from the Scheme would be in the order of approximately 20 seconds in the eastbound direction and approximately 10 seconds in the westbound direction.

7. Economic Appraisal

7.1 A cost benefit analysis has been undertaken using the TUBA software to quantify user time and vehicle operating cost savings.

7.2 An accident analysis using the COBA-LT software forms part of the economic appraisal. WS2+1 roads are safer than S2 roads, which

means the Scheme would result in a reduction in the number of accidents. Under central growth assumptions the accident analysis forecasts a saving of 41 personal injury accidents resulting in 51 fewer casualties over the 60-year appraisal period.

7.3 The economic appraisal also captures benefits and disbenefits associated with user greenhouse gas emissions, air quality impacts and noise impacts.

7.4 Scheme costs total £39.5m in 2018 prices. The scheme costs include a risk allowance and Optimism Bias at 15.2%.

7.5 The BCR for the scheme is 0.13 and there is a small variation to this value under low and high growth assumptions, with the BCR ranging from 0.10 to 0.16. A detailed breakdown of economic appraisal results is given in Appendix D (WG 1.2.3).

7.6 Two further sensitivity tests were undertaken in order to assess the impact of alternative future road network configurations. These demonstrate that the BCR is very sensitive to small changes in assumptions, with to the BCR of the Scheme increasing to around 0.6 when lower speed limits are assumed in the Do Minimum.

7.7 It should be noted that the economic appraisal can only include those impacts which can be feasibly monetised. There are a range of impacts which are not captured in the economic appraisal. These include:

a) Journey time reliability;
b) The detailed impact of additional overtaking opportunities (i.e. the full interaction between slower and faster moving vehicles on a vehicle by vehicle basis);
c) Seasonality and periods of high traffic demand;
d) Driver stress and frustration;
e) Freight;
f) Wider economic benefits; and

g) Other environmental and social impacts, such as journey quality, community severance, health and amenity benefits.

8. Conclusion

8.1 The Scheme is one part of a wider set of improvements along the A40 Trunk Road between St Clears and Haverfordwest, which forms part of the Trans European Road Network (TEN-T). It would remove 96% of traffic from Llanddewi Velfrey, which would bring safety, health and amenity benefits to the community as a result of reduced severance.

8.2 Strategic traffic travelling along the A40 would benefit from faster journey times and better journey time reliability. Additional overtaking opportunities would provide a more consistent driver experience along the A40. The Scheme would therefore improve journey quality and reduce driver frustration and stress.

8.3 The economic case for the Scheme indicates poor value for money. However, I regard this as a conservative estimate on the basis that several additional benefits that would be likely to arise are not captured. A key consideration is that the economic appraisal is only one aspect of the overall case for investment, which is why it needs to be balanced against other environmental and social costs and benefits. The economic case should therefore be considered in the context of the overall scheme objectives.

8.4 On balance there is, in my view, a good overall case for the Scheme.