Adran Seilwaith yr Economi
Department for Economic Infrastructure

Llywodraeth Cymru
Welsh Government

THE CHESTER TO BANGOR TRUNK ROAD (A55) (JUNCTIONS 16 AND 16A IMPROVEMENT REALIGNMENT AND SLIP ROADS) ORDER 202-

THE CHESTER TO BANGOR TRUNK ROAD (A55) (JUNCTIONS 16 AND 16A IMPROVEMENT REALIGNMENT AND SLIP ROADS) (SIDE ROADS) ORDER 202-

THE WELSH MINISTERS (THE CHESTER TO BANGOR TRUNK ROAD (A55) (JUNCTIONS 16 AND 16A IMPROVEMENT REALIGNMENT AND SLIP ROADS)) COMPULSORY PURCHASE ORDER 202-

SUMMARY PROOF OF EVIDENCE

Note: See Document Reference WG 1.03.02 for full evidence and referencing

NIGEL ROBERTS BSc (Hons), MSc, CEng MICE, MCILT

WELSH GOVERNMENT, TRAFFIC AND ECONOMICS

DOCUMENT REFERENCE: WG 1.03.01

Contents

1. Author 1

2. Existing Conditions 2

3. Base Year Traffic Model 3

Model Structure 3

4. Traffic Forecasting 4

5. Economic Appraisal 5

Overview 5

Annualisation Factors 5

Construction Costs 5

Construction Delay Costs 5

Accident Appraisal 5

Wider Economic Benefits 5

Value for Money Statement 6

6. Objections to the Scheme 8

7. Conclusion and Declaration 9

1. Author

1.1 My name is Nigel Roberts. I have am a Chartered Engineer, Member of The Institution of Civil Engineers and Member of the Chartered Institute of Logistics and Transport with 35 years of experience of Transport project appraisal and analytical assessment.

1.2 I am the Transport and Economics Witness for the A55 Junction 15 Improvements scheme. My role involves the key tasks of:

a) Traffic Modelling

b) Traffic Forecasting

c) Transport Economic Appraisal

1.3 My Summary Proof of Evidence provides an overview of the traffic assessment and transport economic appraisal aspects of the Junction 15 Scheme.

1.4 The primary reference document for transport modelling and economic appraisal in the UK is the Transport Analysis Guidance (TAG). Details of the appraisal process for the Junction 15 Improvement can be found in the following documents:

a) Traffic and Accident Data Report

b) Assignment Model Validation Report

c) Traffic Forecasting Report

d) Economics Report

e) TAG Data Book, May 2021

f) TAG Unit M3.1 – Modelling

g) TAG Unit M2 – Variable Demand Modelling

h) TAG Unit A1.1 – Cost Benefit Analysis

2. Existing Conditions

2.1 Average traffic flows on A55 at Penmaenmawr were around 36,000 vehicles, combined directional flows, over a 24-hour period. Traffic flows are greater to the east of the town than the west.

2.2 The percentage split for vehicles is Car 76%, LGV 13% and HGV 11% and traffic has been growing at a rate of around 1.5% per annum over the past 20 years.

2.3 Review of accident data for the period 2014 to 2018 revealed during this time there were 29 accidents with groupings on A55 in the vicinity of both junctions 16 and 16A and through the centre of Penmaenmawr.

2.4 Four bus services 5, 75, A55 and X5 serve Llanfairfechan, Penmaenmawr and Dwygyfylchi and are routed along A55 between Bangor and Llandudno.

2.5 Railway stations are located in Llanfairfechan and Penmaenmawr and are served by services towards Chester, Bangor and Holyhead.

3. Base Year Traffic Model

Model Structure

3.1 The transport model developed for A55 Junctions 15 and 16 improvement appraisals uses the SATURN (Version 11.2.05) 'congested assignment' software suite, which is one of the recommended analysis programs in TAG.

3.2 The highway network in the model consists of the area of influence of the A55 scheme and includes the A55 between Junctions 14 and 17 plus the local roads in Llanfairfechan, Penmaenmawr and Dwygyflchi.

3.3 Traffic data was collected in 2016 for building the A55 model, and consisted of traffic link counts, turning counts at junctions, Roadside Interview data collected in Llanfairfechan and Penmaenmawr and journey time surveys on the main routes through the highway network.

3.4 As the common survey year for this data was 2016, the A55 model Base Year was set at 2016. The modelled time periods were the AM Peak Hour (08:00 to 09:00), Average Inter Peak Hour (10:00 to 16:00) and PM Peak Hour (17:00 to 18:00).

3.5 Five traffic User Classes, representing differing vehicle types and driver behaviours were modelled and represented Car, Work Journey Purpose; Car, Commute Journey Purpose; Car Other Journey Purpose, Light Goods Vehicle (LGV) and Heavy Goods Vehicle (HGV).

3.6 Traffic demand for the SATURN models took the form of Origin-Destination trip matrices for each User Class, Time Period and Year combination. These matrices were assigned to the modelled network to produce representations of traffic flows.

3.7 The method for checking model calibration and validation is to compare observed flows with modelled flows, using acceptance criteria in TAG. This comparison demonstrated that the model met these criteria for all vehicle types.

3.8 Modelled journey time data was successfully validated against observed timings for routes along A55, through Llanfairfechan and Penmaenmawr.

3.9 The overall validation process showed that the model was a good representation of existing traffic conditions and suitable for use in the assessment of future conditions.

3.10 Diagrams showing the 2016 Base traffic flows are included in my main Proof of Evidence.

4. Traffic Forecasting

4.1 Traffic forecasts were produced for three peak periods; AM, Inter Peak and PM peaks, for each forecast year (2022, 2037 and 2051). These were assigned to the Do Minimum network (no changes to current highway) and the Do Something network, representing the scheme improvement.

4.2 Traffic growth within the model is equivalent to local DfT TEMPro growth and contains planning data determining population and employment forecasts.

4.3 In addition to the Core forecast assumptions, traffic growth uncertainty factors were applied to the 2022, 2037 and 2051 core scenario matrices to account for the uncertainty of growth estimates of background traffic within the model. These factors were calculated by deriving TAG recommended processes and provided a Low Growth and High Growth set of traffic forecasts.

4.4 The resulting assignment forecast flow diagrams, with and without the improvement scheme, are shown in my main Proof of Evidence.

5. Economic Appraisal

Overview

5.1 The economic appraisal that has been undertaken for the 'Do Something' Core Scenario, Low Growth Scenario and High Growth Scenario for economic growth. This appraisal has been carried out by following the guidance in WebTAG Unit A1.1 'Cost Benefit Analysis and uses Transport User Benefit Appraisal (TUBA) software version 1.9.14. TUBA has been used to compare the preferred improvement scheme against the 'Do Minimum' over a 60-year appraisal period.

Annualisation Factors

5.2 Factors for annualisation were utilised to growth the produced results from the modelled periods to represent all hours during the year. These conversion factors were calculated from permanent traffic counters on A55.

Construction Costs

5.3 Construction costs have been calculated by experienced highway cost consultants. The total estimated scheme cost (excluding VAT) of Junction 16 Preferred Scheme is £23.108m.

Construction Delay Costs

5.4 The DfT program QUADRO (Queues and Delays at Roadworks), Version 4 Release 16, was used to carry out the economic appraisal of travel delay costs.

Accident Appraisal

5.5 The COBALT (Cost and Benefit to Accidents – Light Touch) program has been used to derive the accident benefits of the improvement scheme. COBALT compares the predicted numbers of accidents with and without a scheme and converts them into monetary values by multiplying the numbers of accidents by their monetised costs. This assessment showed that 34 accidents could be saved, over the 60 appraisal period, by the improvement scheme.

Wider Economic Benefits

5.6 The guidance in TAG Unit A2.1, 4.1.8 has been used to calculate these Wider Economic Benefits. These are calculated as a 10% uplift to business user benefits and equate to £0.712m in benefits.

Value for Money Statement

5.7 The same economic appraisal process has been carried out for the Low and High economic growth scenarios. The final Value for Money statement for these scenarios is shown in Table 1, alongside the Core Scenario.

Table 1: Value for Money Statement – Junction 16 Preferred Scheme Scenarios

	J16 Preferred Scheme Low Growth	**J16 Preferred Scheme Core Scenario**	**J16 Preferred Scheme High Growth**
Benefits			
Wider Economic Benefits	£447	£712	£1,632
Accident Benefits	£1,072	£1,583	£1,933
Travel Time Benefits	£8,668	£15,220	£38,605
Vehicle Operating Costs	£1,063	£867	£456
Carbon Emissions Costs	-£12	-£174	-£653
Indirect Tax Benefits	£21	£285	£1,006
Construction Delay	-£462	-£495	-£533
Present Value of Benefit (PVB)	**£10,797**	**£17,998**	**£42,446**
Costs			
Scheme costs	£15,207	£15,207	£15,207
Present Value of Costs (PVC)	**£15,207**	**£15,207**	**£15,207**
Net Present Value (NPV)	-£4,409	£2,791	£27,239
Benefit to Cost Ratio (BCR)	**0.710**	**1.184**	**2.791**

5.8 The Low and High Growth scenarios represent the overall range of scheme performance against changes in economic growth assumptions. However, the Core Scenario assumptions are considered to be the most likely set of economic conditions to occur and the performance of the scheme against these is considered to be the key economic performance indicator by Welsh Government.

5.9 Under these conditions the Junction 16 Improvement demonstrates Low Value for Money.

6. Objections to the Scheme

6.1 Responses to objections to the scheme proposals on traffic grounds have been provided in a series of Rebuttals. These have been summarised in my main Proof of Evidence.

7. Conclusion and Declaration

7.1 My proof of evidence includes facts which I regard as being relevant to the opinions which I have expressed, and the Inquiry's attention has been drawn to any matter which would affect the validity of that opinion.

7.2 In my opinion the Traffic and Economic Assessment, has been carried out and published in accordance with legislation and professional guidance.

7.3 I believe the facts I have stated in this proof of evidence are true and that the opinions expressed are correct.

7.4 I understand my duty to the Inquiry to assist it with matters within my expertise and believe that I have complied with that duty.