



A5 Western Transport Corridor (A5 WTC)

Appendix TNI – Theme Report: Economic Assessment

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Introduction

1. The Major Scheme Business Case (MSBC) completed in June 2012 included an economic appraisal of the A5 WTC scheme. This economic appraisal assessed the benefits to road users of the new road set against the capital costs of construction, expressed as a Benefit to Cost ratio (BCR). This demonstrated that the scheme represented good value for money. In July 2012 the Department of Finance and Personnel confirmed that it was content with the MSBC and confirmed its approval for investment in Phase 1 (now Phases 1a and 1b) of the scheme.
2. In addition to the economic appraisal, a macro-economic study of the impact of the Proposed Scheme in relation to the wider economy was undertaken by an independent economic consultant ECOTEC. This was presented to the Public Inquiry in 2011 (A5 Western Corridor: Macro-economic study; May 2009). This demonstrated that the scheme produced benefits to businesses. In accordance with WebTAG guidance, these wider benefits were not included in the calculation of the BCR.
3. The MSBC is programmed to be reassessed in 2017. Notwithstanding, following representations made to the draft Orders and Environmental Statement in April 2016 relating to the scheme economics, it was decided to undertake a new economic appraisal.
4. This new economic appraisal together with the assessment of Wider Economic Benefits (now called Wider Impacts) was undertaken during autumn 2016 using updated traffic forecasts from the re-based model and the latest economic parameters. The traffic forecasts are described in a separate Theme Report.
5. The purpose of this note is to describe the new economic appraisal and wider impact analysis carried out for the A5 WTC and present the results of the assessments. A comparison of the latest benefits with reference to the previous assessments is also provided.

Economic Assessment

6. A new economic appraisal of the A5 WTC scheme was prepared in September 2016 in accordance with the Green Book - Appraisal and Evaluation in Central Government (“the Green Book”) (HM Treasury, 2003 – updated July 2011).
7. The A5 WTC scheme was assessed in ‘value for money’ terms, to determine whether the scheme offered sufficient economic benefits to be viable.
8. The calculation of economic benefits to road users (excluding accident benefits) was undertaken using the Department for Transport (DfT) TUBA

V.1.9.7 (Transport Users Benefit Appraisal) program. TUBA compares the costs for the Do Minimum against the cost for the Do Something scheme to establish the value of the savings in travel time and vehicle operating costs.

9. Accident benefits (the reduction in accident costs as a result of the scheme) were assessed using the DfT's COBALT program, which is consistent with WebTAG guidance, and the results added to the final calculation.
10. Road user and accident benefits were based upon the recent forecasts that are consistent with the Environmental Statement and described in detail in the Traffic Forecast Theme Report. Carbon benefits and Indirect Tax revenues are calculated within TUBA as a function of vehicle operating costs which are modelled by the program.
11. By comparing all construction and associated costs with the traffic user benefits, conventionally over a 60 year period from the opening of the first phase, a BCR was calculated.
12. The TUBA program calculates benefits on a year by year basis, over 60 years and the results are accumulated as discounted values at 2010 levels. The phased approach to construction means that benefits need to be calculated for each year taking account of the completion of each phase. For the purpose of the assessment it is assumed that the first phase of the scheme (i.e. including Phases 1a and 1b) is open from 2019 to 2022, the second phase is open from 2023 to 2027 and the third phase is open from 2028 onwards.
13. The latest cost estimates for the A5 WTC Proposed Scheme include construction, land, and preparation and supervision costs, all at Quarter 3:2016 prices. The base costs were then converted to the Present Value of Cost (PVC) through discounting to 2010.
14. A risk allowance and optimism bias was included to allow for unexpected costs in accordance with guidance in TAG Unit A1.2.

Results of Economic Assessment

15. The results of economic appraisal for the A5 WTC scheme based upon the TUBA and COBALT assessment are summarised in Table 1 below.

Costs and Benefits	Value Discounted to 2010 (£M)
Total User Benefits	1081.0
Accident Benefits	126.0
Carbon Benefits	-26.6
Indirect Tax Revenue	53.5
Present Value of Benefits (PVB)	1234.0

Present Value of Cost (PVC)	656.9
Net Present Value (NPV)	577.1
Benefit to Cost Ratio (BCR)	1.88

Table 1 Economic Appraisal A5 WTC (Updated 2016)

16. A description of the economic assessment including a detailed breakdown of benefits by user category is provided in the Economic Assessment Report.

Comparison with 2012 Economic Appraisal

17. The economic appraisal carried out in June 2012 for the business case was based upon TUBA for the user benefits, and COBA for accident benefits. In accordance with the guidance at that time, the costs and benefits were discounted to a 2002 present year.
18. The 2012 assessment was based upon a phased opening of the scheme as follows:
- I. Phase 1 2015
 - II. Phase 2 2021
 - III. Phase 3 2025
19. The result of the economic appraisal for the A5 WTC scheme carried out in 2012 for the scheme business case is set out in Table 2 below.

Costs and Benefits	Value Discounted to 2002 (£M)
Total User Benefits	662.7
Accident Benefits	64.6
Carbon Benefits	-8.2
Indirect Tax Revenue	18.2
Maintenance Benefits	24.8
Present Value of Benefits (PVB)	762.1
Present Value of Cost (PVC)	454.5
Net Present Value (NPV)	307.6
Benefit to Cost Ratio (BCR)	1.68

Table 2 Economic Appraisal for 2012 Business Case

20. The economic results for the 2016 assessment presented in Table 1 show that the BCR is similar to the previous BCR from the 2012 Business Case (Table 2). Benefits and costs are now proportionately higher since they are discounted to 2010 compared with 2002 previously.

Wider Impacts / Wider Economic Benefits

21. Wider Impacts is the latest term for the quantities previously known as Wider Economic Benefits. These refer to the economic impacts of the Scheme which affect the wider economy, in addition to the benefits to transport users, presented above.
22. Wider Impacts are defined in TAG Unit A2.1. They involve the following components:
 - i. **Agglomeration Benefits** - These arise from the positive link between density and productivity. When employment clusters together, the jobs in the cluster are likely to be more productive than they otherwise would be, due to better access to labour, increased competition between suppliers and greater interaction between businesses spreading knowledge.
 - ii. **Increase in Output in Markets with Imperfect Competition** - In markets which are dominated by a few suppliers, prices may be above the quantity which would occur in competitive markets. Transport investment may induce a price reduction and an increase in the quantity supplied, through its impact upon firms' cost base. This benefit is calculated as 10% of the benefits to business users, which are extracted from the TUBA appraisal.
 - iii. **Move to More or Less Productive Jobs** - If a transport scheme causes a relocation of jobs, this may lead to a change in productivity, for example, if jobs were to move from an area of low to high productivity. DfT WebTAG advises that this impact can only be valued if a Land Use-Transport Interaction (LUTI) model is used, and even then it can only be included as a sensitivity test.
23. The latest assessment of Wider Impacts has taken account of items (i) and (ii) only. Item (iii) was ignored as it requires a LUTI model (which has not been developed). Furthermore, it is noted that the estimated benefits were very low in 2012. The assessment of the Agglomeration benefits of the A5 WTC scheme (item i) was undertaken by Volterra in September 2016. This assessment was intended to update the previous study by ECOTEC in 2009.
24. The Volterra study focused on the increase in productivity resulting from the improvements in connectivity achieved by the Proposed Scheme. The assessment was carried out in line with the DfT WebTAG guidance set out in TAG Unit A2.1 and the detailed methodology is described in 'A5 Western Transport Corridor, Wider Economic Benefits: A technical note by Volterra Partners' dated October 2016.

25. A stream of Agglomeration benefits over 60 years (2028-2087) was estimated, and converted into a Present Value by discounting to a base year of 2010.
26. The further benefit associated with the 'Increase in output in markets with imperfect competition' (item ii) was calculated by adding a value worth 10% of the time savings to business users from the TUBA appraisal, as advised by WebTAG A2.1.
27. The latest Wider Impact benefits for the A5 WTC scheme are presented in Table 3 below.

Wider Economic Benefits	Value Discounted to 2010 (£M)
Agglomeration	112.2
Increase in output in markets with imperfect competition	70.1
Total	182.3

Table 3 Wider Economic Benefits A5 WTC (Updated 2016)

28. A detailed analysis of the benefits including the spatial distribution, is included in the Volterra technical note.

Comparison with the previous assessment of Wider Impacts

29. ECOTEC Research and Consulting Ltd undertook a full macro-economic study of the impact of the proposed Scheme in 2008, (reported in May 2009). This assessed the benefits to the wider economy, over and above the standard transport user benefits. The assessment was carried out in line with the then current WebTAG guidance (Unit 3.5.14) and covered Agglomeration Impacts, Output change in Imperfectly Competitive Markets and Labour Supply Impacts (now termed 'Move to More or less Productive Jobs').
30. The results of the assessment that was presented to the 2011 Public Inquiry are presented in Table 4 below.

Wider Economic Benefits	Value Discounted to 2002 (£M)
Agglomeration	103.1
Increase in output in markets with imperfect competition	38.6
Labour Market Impacts	1.4
Total	143.1

Table 4 Wider Economic Benefits A5 WTC (ECOTEC Study 2009)

31. The results from the latest study presented in Table 3 above show that the Wider Impacts are similar to the previous results presented in Table 4. The

current benefits are discounted to 2010 whereas previously a 2002 present year had been used.

Conclusions

32. An assessment of economic benefits from the Proposed Scheme was carried out to update the results of the 2012 economic assessment used for the Business Case. The latest results are similar to those from the earlier assessment after taking account of the change in the present year from 2002 to 2010. There is a modest increase in the Benefit to Cost ratio, which continues to demonstrate that the scheme represents good value for money.
33. A re-assessment of Wider Impacts was also carried out to update the 2009 analysis prepared by ECOTEC. This took account of the latest WebTAG guidance that was issued in January 2014. Despite some changes in methodology, the total benefits are of the same order as those from the 2009 study, taking into account the change in the present year base.
34. It is noted that the Wider Economic Benefits are produced for information only and do not form part of the BCR calculations.