

Transport and Works Act 1992

CAMBRIDGESHIRE GUIDED BUSWAY ORDER

Position Paper – Cost Benefit Analysis

August 2004

This is one of a series of position papers being produced by Cambridgeshire County Council on issues concerning the Cambridgeshire Guided Busway (CGB). A full set of current position papers will be found on the County's website at www.cambridgeshire.gov.uk/sub/eandt/planning/raptrans/index.htm

The TWA Order and associated planning request for the CGB will be the subject of a public local inquiry commencing on 28 September 2004 when the project will be examined in detail. If you have any queries concerning this paper, please contact the CGB team on 01223 716972 or transport.plan@cambridgeshire.gov.uk.

1. COST/BENEFIT ANALYSIS, FINANCIAL CASE AND FUNDING

Introduction

- 1.1 Detailed analyses have been undertaken of the economic (cost/benefit) and financial cases for the Cambridgeshire Guided Busway (CGB). These have been undertaken in accordance with the latest Government guidance for major public transport schemes. This guidance details the methodology to be followed and the economic and financial parameters to be used in the analyses.
- 1.2 A full economic and financial appraisal was submitted to Government in July 2002 (CCC.A28) and updated in 2003 (CCC.A35). This section provides a summary of the most recent appraisal, together with details of the funding sources for CGB.

Economic Appraisal

- 1.3 The overall economic performance of a transport project is presented in a Transport Economic Efficiency Table (TEE). This economic appraisal is focused upon determination of the relationship between the value of the benefits delivered by a project and the cost to Government of delivery of the project. A summary of the main valuations from the TEE table for CGB is given in Table 1.1.
- 1.4 The TEE table quantifies the benefits by looking at them in the following ways:
- **Present Value of Benefits (PVB)** represents user and non-user benefits related to travel time, vehicle operating costs and user charges (fares, parking fees etc). Impacts are calculated across all appropriate modes of transport. In the case of CGB, the principal benefits are travel time savings for CGB users, in addition non-user benefits arise as a result of reduced road traffic (and thus reduced congestion);
 - **Present Value of Costs (PVC)** is the cost to Government and is made up of all Government contributions to construction and operation, including tax revenues lost when users switch modes (principally reduced vat and fuel duty when car drivers switch to guided bus);
 - **Net Present Value (NPV)** represents the net effects of benefits and costs once allowance for discounting has been made. A positive NPV indicates that the value of the benefits exceeds the value of the costs; and

- **Benefit/Cost Ratio (BCR)** refers to the rate at which benefits exceed (or not) costs to government. A value above 1 indicates that benefits exceed costs and the higher the BCR the greater the amount by which benefits exceed costs.

1.5 The main economic assumptions used to calculate these values are as follows:

- the opening date is 2006. NB opening is now expected to be 2007 but a one year change in date will not affect the appraisal materially;
- the assessment period is 30 years from opening year, thus benefits and ongoing costs (operation and maintenance) are calculated for a 30 year period. Discounting is applied, thus gradually reducing the current value of benefits and costs during the life of the project;
- for the first few years only a proportion of the benefits are included to reflect the build-up in patronage of a new transport system – 50% in Year 1, 75% in Year 2 and 100% in Year 3;
- The total capital cost estimate for the CGB project is £86.5 million at 2002 prices. This has been discounted back to 1998 for the TEE assessment, and has been subject to optimism bias (where the cost is increased to reflect risk and uncertainty) in accordance with Government guidance; and
- monetary valuations for the benefits have been taken from the latest Government guidance as noted above.

1.6 A summary of the figures in the TEE table is shown in Table 1.1 below (note that costs are shown as negative and ratios do not have units):

TABLE 1.1 SUMMARY OF TEE TABLE VALUATIONS

Assessment Element	Value in 1998 prices (£000s)
Present value of benefits	230,386
Present value of cost to Government	-102,080
Net present value	128,306
Benefit/cost ratio BCR	2.26

1.7 The TEE table demonstrates that the Scheme and Project will generate substantial benefits, including:

- the benefit/cost ratio is 2.26, representing excellent value for money; and
- the analysis of Net Present Value shows the generation of substantial benefits in excess of costs over the 30 year assessment period.

1.8 A number of sensitivity tests were undertaken as part of the appraisal submitted to Government. These examined variations in:

- journey times;
- fares;
- access/waiting times;
- model parameters;
- land use development assumptions; and
- competitive response from non-guided bus services.

1.9 These variables were tested individually and in packages. The sensitivity tests showed that the project is economically robust.

Financial Case

1.10 The financial case considers the costs of revenues associated with the operation of the services and the maintenance of the infrastructure.

Operating Costs

1.11 The required operating costs are estimated as £2.2 million in 2006, increasing to £3.1 million in 2016. This is based on mileage and operating staff calculations using the service schedule and forecast patronage. Additional vehicles have been included on the basis of demand. Off-peak mileage and operating staff requirements have been based on the minimum schedule for peak-hours. This equates to 6 hours per day at peak service levels and 12 hours per day at the minimum service level, with an overall 18 hour operating period.

1.12 The main operating cost assumptions used to calculate this total are as follows:

- CGB services are entirely additional to existing services and operated by new vehicles purchased. This represents a worst case assumption as some conventional bus services are likely to transfer to become CGB services and thus additional operating costs will not be incurred; and
- annual maintenance cost of £0.43 million. This includes maintenance of the guideway, park and ride sites and information systems;
- the required number of vehicles to operate the system is 14 vehicles in 2006 rising to 27 vehicles in 2016;
- vehicles are assumed to cost £0.15 million at 2002 prices, with a useful life of 12 years and zero residual value.

Revenues

1.13 Revenue estimates have been developed from the forecast demand and assumed fare structure and are based on the following assumptions:

- fares are based on the assumption that they will include a fixed cost of 64p plus 7p per kilometre. This broadly equates to the cost of existing fares for services operating along the A14 Huntingdon to Cambridge route, with a quality premium of 10% to reflect the higher quality service. No increase in real fare prices over time has been assumed;
- demand has been forecast at years 2006 and 2016. Revenue for other years has been derived through straight line interpolation between the forecast years and extrapolation beyond 2021; and
- based on these assumptions, the forecast revenue (2002 Q2 prices) for the forecast years is £5.12 million in 2006 increasing to £8.64 million in 2016. This is prior to the application of patronage build-up rates as discussed in paragraph 1.5.

1.14 Table 1.2 contains a financial summary based upon the preceding assessment of costs and revenues. All costs and revenues are presented at constant 2002 prices. Revenue for 2006 is assumed at 50% of the forecast level to reflect patronage build-up as noted above.

TABLE 1.2 FINANCIAL INPUT (£MILLION, 2002 PRICES)

Year	Revenue	Fleet capital	Fleet operating	System Operating (incl. risk)	Operating surplus
2006	2.56	2.10	2.19	0.43	-2.16
2016	8.64	0.90	3.11	0.43	4.20

1.15 There is a clear financial case once the capital costs have been met. Further, on the basis of the forecast patronage and expected operational costs, operations are estimated to move into surplus at an operating level after the first few years of operation.

Project Funding

1.16 The Annex E (Appendix 10 to the Local Transport Plan APR 2000-2002) (CCC.A28) bid for £65.4 million in 2002 second quarter prices plus a £8.4 million allowance for inflation giving a total cost of £73.8 million. This had followed discussions with the Department for Transport (DfT) and the submission of an updated bid in summer 2003

[CCC.A35). The DfT wrote to the County Council in December 2003 indicating that provisional funding of £65 million will be available for the Project. In accordance with normal Government practice this funding will be split between direct grant and supported capital expenditure which is intended to be revenue neutral to the County Council. Further development and the availability of further design information resulted in a revised Project cost estimate of £86.5 million, including inflation.

1.17 The balance of the Project funding requirement, some £21 million, will be met from any additional Central Government grants that may be negotiated and contributions arising from other sources including from developers in respect of the substantial development in the corridor served by the Project. That development includes the prospective developments below.

- Arbury Park;
- Northstowe;
- Clay Farm;
- Addenbrooke's 2020; and
- other smaller scale developments in the corridor.

1.18 Funding will therefore be available to enable the Project to be implemented in full.