

Appendix 4A
Preliminary Economic Assessment
(August 2004)

HEYSHAM/M6 LINK – PRELIMINARY ECONOMIC ASSESSMENT (AUGUST 2004)

Manual calculations of costs and benefits were undertaken using the Highways Agency's Project Appraisal Report (PAR) methodology. In particular, guidance and worksheets for 'Full PAR 3.1' were followed. To date, the traffic model has been developed for the morning peak (0700 – 1000) period; once equivalent evening peak and inter-peak traffic models are available the Department for Transport's TUBA software will be used to carry out formal economic evaluations.

Costs

For both the Western Route and Northern Route options cost estimates were prepared at Q4 2003 prices. The overall scheme estimates, including all land, design and site supervision, are: Western Route £ 113 million; Northern Route £ 92 million. Using the PAR worksheets and appropriate factors, and assuming a scheme opening year of 2010, the Present Value of Costs (PVC) at 1998 market prices discounted to 1998 for each option was calculated with results as follows: Western Route £ 97 million; Northern Route £ 79 million.

Benefits

With the traffic model Do Something matrices having a greater number of trips than the Do Minimum matrix – due, in the Do Something, to the assumed complete regeneration of the Luneside West development coupled with additional induced traffic – the appraisal of both time and vehicle operating cost benefits followed the variable matrix method known as the 'rule of a half'. In brief, where the decrease in the cost of a trip leads to an increase in the number of vehicles making that trip, the user benefits are given by:

$$\frac{1}{2}(TM + TS)(CM - CS)$$

where CM and CS are, respectively, the cost of a trip undertaken in the Do Minimum and Do Something and TM and TS are the number of trips being undertaken in either case.

Output from the traffic model, in the form of both trip matrices and cost skim matrices, was utilised to compute, across all origin and destination pairs, the various terms in the above expression. This was carried out for each scheme option. The cost skim matrices were on the

basis of time only (for value of time benefits), and distance only (for vehicle operating cost benefits). Again, the PAR worksheets and appropriate factors were used to evaluate, over 30 years, the total Present Value of Benefits (PVB at 1998 market prices and values) for the morning peak period. An 'all hours' estimate was achieved by scaling the results on the basis of factors derived from previous evaluations. This gave the following values: Western Route £ 463 million; Northern Route £ 451 million.

It should be noted that benefits due to 30-year accident savings were not assessed. An up-to-date safety model, based on the latest available version of the Department for Transport's COBA program, is required and this was still to be prepared.

Summary of Results

The results of this economic assessment are as detailed in the attached table. Both schemes give very good value for money with the Net Present Value (NPV) for the Northern Route being marginally higher.

In terms of the Benefit to Cost Ratio (BCR), however, it is the significantly cheaper Northern Route that is superior – with the estimated ratio at this preliminary stage being some 19% higher than that for the Western Route. (It should be noted that the Department for Transport considers BCR values of this magnitude to be 'at the higher end' but they are not unprecedented).

Comparison with 2001 Public Consultation

The evaluations undertaken prior to this consultation assumed costs of, respectively, £59 million and £62 million for the Western and Northern Routes. The resultant BCR's were 3.7 for the Western Route and 3.4 for the Northern Route. The cost of the Western Route has, therefore, increased by 92% whereas the Northern Route is 48% dearer. In respect of the BCR's the Western Route shows a 30% increase, whilst there is a 68% increase for the Northern Route.

The significant increased value of the BCR's may be explained as follows:-

- The time and vehicle operating cost savings now derive from a fully validated model. Previously the COBA-based economic model, which placed a limit on benefits by the use of minimum link speed cut-offs, was never validated against observed journey time data.
- The use of a congested assignment model has resulted in an increased level of transfer to the schemes.
- A lower discount rate has been assumed (3.5% as opposed to 6%).
- The assumed scheme opening year is now 2010 – as opposed to 2008.

(NJC 12/8/04)

HEYSHAM/M6 LINK PRELIMINARY ECONOMICS

(£ million 1998 prices discounted to 1998)

Route Option	WESTERN	NORTHERN
PRESENT VALUE OF COSTS (PVC)	97	79
BENEFITS		
Time Savings	454	463
Vehicle Operating Costs	9	-12
Accident Benefits	u/a	u/a
PRESENT VALUE OF BENEFITS (PVB)	463	451
NET PRESENT VALUE (NPV=PVB-PVC)	366	372
BENEFITS TO COST RATIO (BCR=PVB/PVC)	4.8	5.7