Leeds NGT: VfM issues

Paper for IDC meeting on 15th May 2012
Main messages

- The BCR of Leeds NGT is sensitive to any changes in underlying assumptions.
- The BCR is sensitive to the value attached to quality which is itself subject to a high level of uncertainty.
- The mix of standard and non-standard works and the development of the scheme warrants a lower optimism bias rate.
- Highway dis-benefits of over £100m have been estimated but they are uncertain.
The BCR of Leeds NGT is sensitive to any changes in underlying assumptions.

The calculation of Benefits and Costs used in the appraisal are the difference between two large numbers – changes in these numbers has a big impact on our estimates of Net Benefits and Costs.

Benefits = £396m minus £197m

Costs = £355m minus £280m

Benefits to public transport users, accidents, CO2, indirect tax

Dis-benefits to highway users and existing bus operators

Capital and O&M costs for NGT, loss in rail and parking revenues

NGT revenues

The sensitivity tests provided by the bidder show significant changes in the BCR particularly for those tests in which NGT demand changes.

<table>
<thead>
<tr>
<th>Test</th>
<th>BCR</th>
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<tr>
<td>DfT’s central case</td>
<td>2.6</td>
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<td>Reduced quality benefits (-16%)</td>
<td>1.2</td>
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<td>Longer NGT run times (-17%)</td>
<td>1.1</td>
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<td>Premium fare (-10%)</td>
<td>2.2</td>
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<tr>
<td>Alternative operator response (-4%)</td>
<td>2.8</td>
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<tr>
<td>Low growth (-9%)</td>
<td>1.6</td>
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<tr>
<td>No Holt Park extension (-12%)</td>
<td>2.1</td>
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Tests which significantly reduce NGT demand are highlighted (change in 2031 patronage shown in parenthesis). The BCR is very sensitive to these tests as reductions in demand affect both benefits and the net cost of the scheme (less revenue is available to offset capital and operating costs).

It is unusual within the Local Majors Programme to have schemes with this pattern of costs and benefits (xxxxxxxxxx was similar) – typically DfT/LAs do not recoup a high proportion of costs.
The BCR is sensitive to the value attached to quality which is itself subject to a high level of uncertainty.

The scheme would deliver a range of improvements to the quality of stops and vehicles – these were valued as part of a local study.

Value of selected attributes (pence per journey, commuting NCA)

- **Lighting** from poor to good (25.6p)
- **CCTV** from none to on board and at stop (27.6p)
- **Bus type** from old to very new (13.4p)
- **Information** from ‘like now’ to ‘advanced electronic display at stop and on board’ (24.6p)
- **Shelter** from ‘flag only’ to ‘nice shelter with plenty of space and nice design’ (33.8p)

This study also found that there was no preference for tram or trolleybus over and above the attributes that could be specified and valued.

There are two sources of uncertainty concerning the use of these values in the appraisal:

**The values used are too large**

- **Issue**: some of these attributes have been valued as low as 3-4p (e.g. see TRL Black Book)
  - The promoter has “capped” the total value of improvements at stop so the benefits aren’t as large as the raw figure suggests
  - The average value (per passenger) of improvements to vehicle and stop quality is 11 minutes – this is similar to DfT research which indicates that a high quality conventional bus system could deliver benefits equivalent to 9.4 min per passenger across 10 English towns.
  - Johnson et al (for UK Tram) found average advantage for tram over conventional bus of 10.4 minutes

**The quality differential over bus will reduce over time**

- **Issue**: conventional bus services will improve over time thus reducing the quality premium enjoyed by NGT
  - All the service attributes of NGT can be applied to conventional buses
  - No specific allowance for smartcards are applied although real time information is a significant component
  - Renewals offer opportunity to upgrade quality: new vehicles every 15 years (refitted every 7.5 years) and stops renewed every 10-20 years

Source: (1) DfT (2010) The role of softer factors in patronage growth & modal split in the bus market in England
The mix of standard and non-standard works and the development of the scheme warrants a lower optimism bias rate.

Whilst a trolleybus system is innovative for the UK a significant proportion of scheme costs relate to standard highway works – the standard 66% rate of Optimism Bias applied to costs for light rail schemes is likely to be too conservative.

- HMT (Green Book) guidance allows a combined Optimism Bias to be applied where there is a mix of standard and non-standard works.
- The bidder reports that non-standard works (OLE works, interfaces with HA/NR, statutory undertakings, testing and commissioning) account for 28% of total costs.
- This would give a combined OB rate of 49.4%.

The provision for Optimism Bias can be reduced where there is evidence that the causes of cost over runs have been mitigated.

- The promoter has a good understanding of the corridors and the design of the scheme has been worked up to a standard beyond PE in advance of a TWAO application. Furthermore, there is strong local commitment to this scheme.
- Post-mitigation we think a combined OB rate of 36.3% is appropriate for this scheme.

Optimism Bias varies between 33% and 45% post mitigation depending on assumptions about what proportion of the scheme is considered non-standard civil engineering.
Highway dis-benefits of over £100m have been estimated but they are uncertain.

Overall Effect

The scheme is forecast to cause delays to general traffic leading to approximately £110M of disbenefits to highway users, with the vast majority of this affecting business travellers.

Uncertainty in Results

There is significant uncertainty associated with the model used to forecast the highway impacts of the scheme. Although the model has been appropriately developed, including segmentation across different traveller types and time periods, the base model doesn’t replicate observed flows and journey times to the standard expected by DfT guidance. An indication of the impact of different flow levels on the appraisal results are given by the ‘low’ and ‘high’ growth sensitivity tests, which in the worse case show an increase in disbenefits to highway users of £65M.

Detailed Highway Impacts

The impacts on the highway network are driven both by the extraction of highway users onto NGT (tending to reduce delays) and the impact of the scheme itself, which at a number of locations (particularly on the North route) reduces general highway capacity, and therefore tends to increase delays. The model results show that the scheme is expected to lead to slight benefits overall in the AM peak; with significant disbenefits accruing to travellers in the Interpeak and to a lesser extent the PM peak. In general most of these effects are confined to the NGT corridor. The plot below shows an example of the change in delay in the interpeak (in 2031) in the North NGT corridor.