ALL/2/1P

Themes: Case for Project & Traffic Models

Proof of Evidence by

Keith Buchan

for the

MERSEY GATEWAY PROJECT

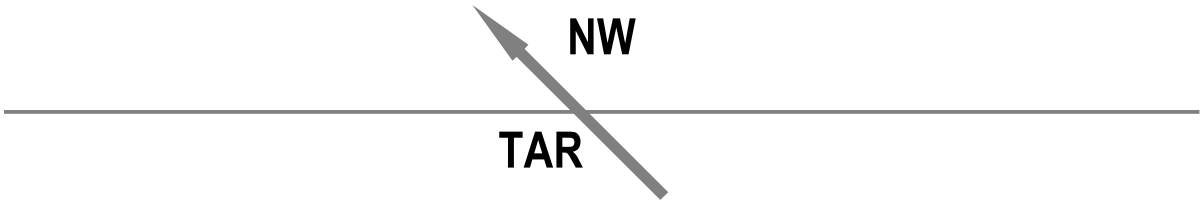
PUBLIC INQUIRY

on behalf of

The Alliance

comprising

the North West Transport Roundtable



and

Friends of the Earth

May 2009

This proof of evidence relates to the implications of the following applications and proposed orders:

1. Planning application for full planning permission for works lying within Runcorn comprising improvements to the Central Expressway, Weston Link, the Weston Point Expressway and junction 12 of the M56 motorway, dated 31 March 2008.

   Appeal references: APP/D0650/V/08/1203385/2095113 and APP/D0650/V/1203384/2095069

2. Planning application for full planning permission for works lying within Widnes comprising modifications of the northern approaches to the Silver Jubilee Bridge. Dated 31 March 2008.

   Appeal reference: APP/D0650/V/08/1203386/2095114

3. Listed Building Consent Application for modifications to the Silver Jubilee Bridge, dated 31 March 2008.

4. The River Mersey (Mersey Gateway Bridge) Order (application under section 6 of the Transport and Works Act 1992 to the Secretary of State for Transport for an order under section 3(1)(b) of that Act).

   Reference: TWA/08/APP/05

5. The A533 (Silver Jubilee Bridge) Road User Charging Scheme Order 2008.

6. The Halton Borough Council (Mersey Gateway – Queensway) Compulsory Purchase Order 2008.

7. The Halton Borough Council (Mersey Gateway – Central Expressway) Compulsory Purchase Order 2008.

8. The Halton Borough Council (A533 Central Expressway) Side Roads Order 2008.

9. The Halton Borough Council (A533 Queensway) Side Roads Order 2008.

1 Author

1.1 My name is Keith Alexander Buchan and this Proof is submitted as part of the advice provided to The Alliance, who are objectors to the scheme for a Mersey Gateway Bridge under consideration at this Inquiry. I have an MSc in Transport Planning and Management and I am a Member of the Institution of Highways and Transportation, and of the Transport Planning Society.

1.2 I have over 25 years of experience in transport planning, much of it for local authorities both as a senior officer and a consultant. Since 1990 I have been Director of the Metropolitan Transport Research Unit (MTRU). In this role I have undertaken projects for City, County and Regional authorities in the UK. This included extensive work on innovative bus schemes in the UK and Europe and travel demand planning (sometimes called smart choices or personalised travel planning). MTRU has also undertaken research for the DfT (and as DETR) on objectives led appraisal, accessibility planning, parking standards and PPG13. I have also worked for commercial companies, community groups and environmental interest organisations.

1.3 As far as climate change is concerned, I have recently completed a two year project on this in relation to transport policy (November 2008). Phase 1 proposals included a first year car sales tax on high emitters and the importance of carbon budgeting.

1.4 In 1996/7 I was a member of the Advisory Group for the 1997 National Road Traffic Forecasts and am currently a member of the DfT's Expert Group on reforming NATA (the New Approach to Transport Appraisal).

2 Introduction to the Proof

2.1 This Proof of Evidence deals with the issue of value for money and the need for this particular scheme to address transport problems in the area. I will draw on the DfT Guidance, as published on the net through http://www.dft.gov.uk/webtag. This in turn relies on the Treasury Green Book. In both cases, the preparation of reasonable alternatives against which the scheme can be properly assessed is the key test. This Proof sets out how this was not done in this case, and suggests what sort of alternatives should have been considered. In terms of the Inquiry, this issue is within Theme 1 but is also relevant to Theme 3.

2.2 This issue also relates to the preparation of a realistic Do Minimum. For climate change reasons alone, the Do Minimum as presented is very unlikely to be acceptable to policy makers because it facilitates significant increases in carbon emissions. In reality, considerable remedial action is almost certain to be taken over the next decade and beyond. This affects the whole justification for the bridge scheme, since its impacts are tested against the transport patterns in the Do Minimum. The differences in these patterns of travel are assumed to continue to 2074, well beyond the key climate change target dates of 2020 and 2050. The need for further action highlights the significance of the failure to develop and test proper alternatives. These are in fact the most likely way forward. The Mersey Gateway Sustainable Transport Strategy indicates the type of policy which will be required, but has not been fully developed or subjected to testing in the available multi-modal model.

Inquiry Theme 1

3 Government Guidance and Transport Appraisal

The Green Book

3.1 The Green Book is the starting point for all appraisal across Government Departments. The DfT's appraisal guidance, published on the web as "webtag" refers back to the Green Book and explores its application in the transport field.

3.2 The approach is very clear. First the objectives are defined. These are not scheme specific, thus building a piece of infrastructure is not an objective, it is only valued as a means to achieving an objective.

"5.1 The purpose of option appraisal is to help develop a value for money solution that meets the objectives of government action. Creating and reviewing options helps decision-makers understand the potential range of action that they may take."

3.3 And under "Creating Options, it goes on:

"5.3 This step involves preparing a list of the range of actions which government could possibly take to achieve the identified objectives. The list should include an option where government takes the minimum amount of action necessary (the 'do minimum option'), so that the reasons for more interventionist actions can be judged."

3.4 It also deals with the issue of interlinked schemes:

"5.5 An option may affect, or be affected by, other expenditure across the public sector (for example, where its outputs or costs depend upon another project or the implementation of a related policy perhaps in another department). Where a number of expenditures or activities are linked together and the costs or benefits are mutually dependent, the proposal must be appraised as a whole. However, the contribution of the component parts of each proposal to achieving overall value for money must be taken into account."

3.5 It is important to create a genuine range of options and to distinguish between "Do Nothing" and "Do Minimum". One of the most common mistakes in appraisal has been to judge a proposed scheme against a future which has little or no interventions designed to meet that particular scheme's objectives. This is explored later and is very much the case for the Mersey Gateway Bridge proposal.

Webtag

3.6 Transport appraisal conforms to the Green Book but contains much more detail. It is available as a web based resource. It is very clear about the processes to be followed. The flow chart for scheme appraisal is shown in several places, for example in Unit 2.1, Figure 2.1, reproduced below.

3.7 One area relevant to this Proof is the relationship between the "Do Minimum", alternative solutions, and the preferred option. In transport, the Do Minimum should reveal what the future will hold with only committed actions included. The unreality of the Do Minimum was a major criticism of appraisal, particularly in the context of management policies. This problem is avoided by the introduction of the webtag guidance on option development. For example, in this case the Do Minimum performs badly in terms of congestion and carbon emissions. It is unlikely that any responsible authority would fail to do anything to address such problems. What should happen is that realistic alternatives and possibly packages of measures should be tested.

3.8 Webtag is clear that the process should begin with underlying problems, not just symptoms, and that these are mode neutral and not scheme specific. This summarised in Unit 1.1 as follows.

"*1.4.3 In all cases, however, the process of identifying solutions should be broadly similar and:*

- *be easily comprehensible, to those commissioning, steering and undertaking the work; and where possible to a wider public;*
- *avoid leading to a particular outcome simply by virtue of the method or process adopted;*
- *enable a wide range of solutions and the synergy between combinations of components to be investigated in a cost-effective manner;*
- *enable a preferred solution to be developed which addresses the objectives and problems at which it is aimed; and*
- *provide a means by which the acceptability of the solution to the public can be tested and taken into account.*

"1.4.4 Typically, a study should include:

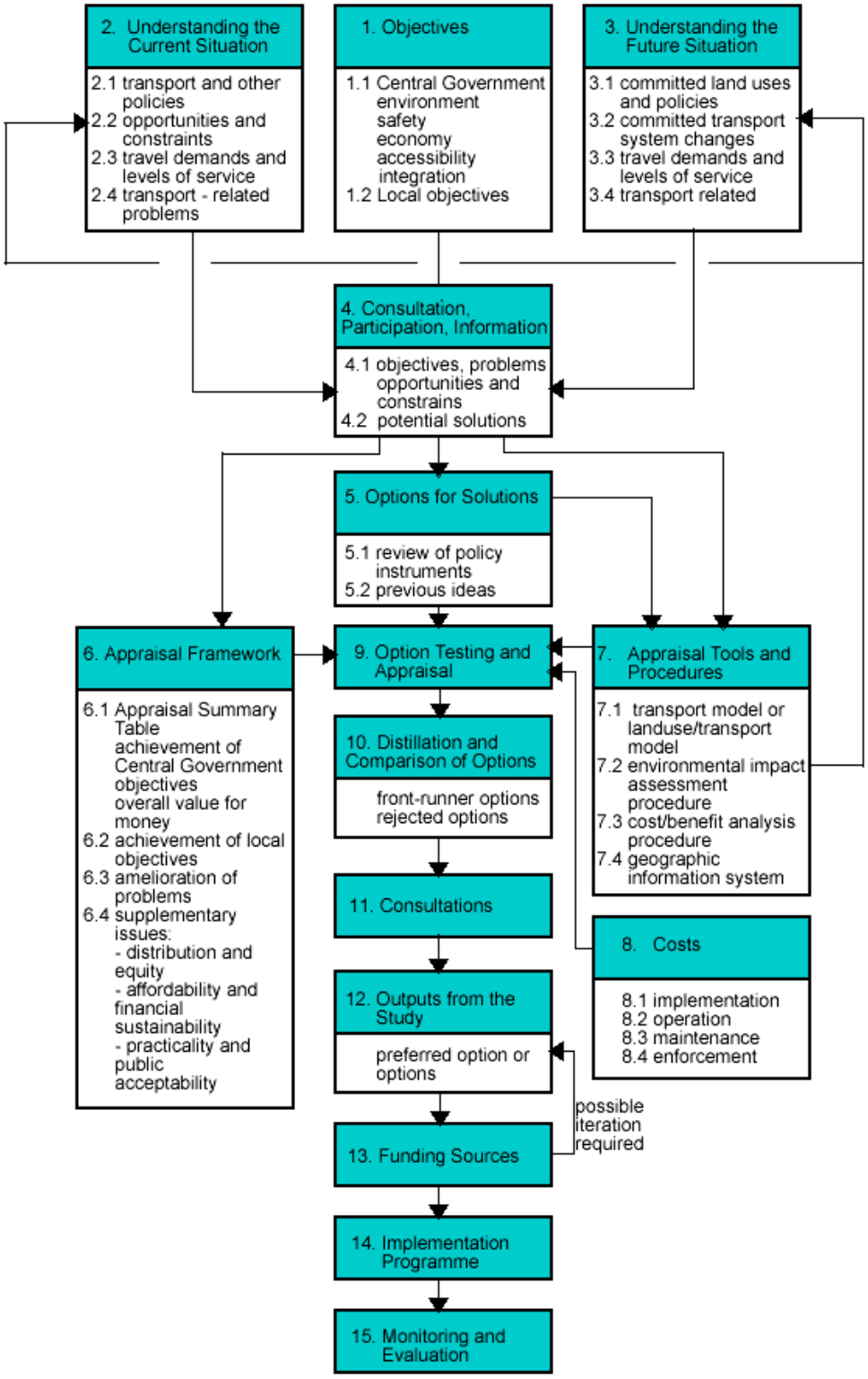
- *agreement on a set of objectives which the solution should seek to satisfy;*
- *analysis of present and future problems on, or relating to, the transport system;*
- *exploration of potential solutions for solving the problems and meeting the objectives;*
- *appraisal of options, seeking combinations which perform better as a whole than the sum of the individual components; and*
- *selection and phasing of the preferred solution, taking account of the views of the public and transport providers."*

3.9 The evidence before the Inquiry from the promoters suggests that the middle three processes from the first list have not been followed.

3.10 In the second list, problems have been identified but not causes and objectives have therefore been unbalanced. The potential solutions have not been explored, although many different bridge and tunnel alignments have been. There has not been any assessment of combined options.

3.11 For this reason, the steps shown in Figure 1 have not been followed and the appraisal does not conform with the Guidance. There are other omissions which are considered later in this Theme.

Figure 1


2. Understanding the Current Situation
2.1 transport and other policies
2.2 opportunities and constraints
2.3 travel demands and levels of service
2.4 transport - related problems
1. Objectives
1.1 Central Government environment safety economy accessibility integration
1.2 Local objectives
3. Understanding the Future Situation
3.1 committed land uses and policies
3.2 committed transport system changes
3.3 travel demands and levels of service
3.4 transport related
4. Consultation, Participation, Information
4.1 objectives, problems opportunities and constrains
4.2 potential solutions
5. Options for Solutions
5.1 review of policy instruments
5.2 previous ideas
6. Appraisal Framework
6.1 Appraisal Summary Table
achievement of Central Government objectives
overall value for money
6.2 achievement of local objectives
6.3 amelioration of problems
6.4 supplementary issues:
- distribution and equity
- affordability and financial sustainability
- practicality and public acceptability
9. Option Testing and Appraisal
7. Appraisal Tools and Procedures
7.1 transport model or landuse/transport model
7.2 environmental impact assessment procedure
7.3 cost/benefit analysis procedure
7.4 geographic information system
10. Distillation and Comparison of Options
front-runner options
rejected options
11. Consultations
8. Costs
8.1 implementation
8.2 operation
8.3 maintenance
8.4 enforcement
12. Outputs from the Study
preferred option or options
possible iteration required
13. Funding Sources
14. Implementation Programme
15. Monitoring and Evaluation

3.12 This lack of consideration of alternatives is revealed by a study of the available documents. Core Documents 204, 208, 213 and 214 refer to alternatives but these are all related to the form and position of a road crossing. The Mersey Crossing Study, for example, is entirely highway based. None of the objectives mention public transport.

3.13 CD 211 contains broader objectives (page 2) which do include public transport, walking and cycling. These are to:

- Relieve the Silver Jubilee Bridge
- Maximise development opportunities
- Improve public transport links across the river
- Encourage the increased use of walking and cycling

3.14 These are referred to in HBC/2/1P, paragraph 4.4.2 and form the basis for the current objectives, set out in paragraph 4.4.4, which add the application of tolling, air quality and urban environment, and network resilience.
Paragraph 4.4.3 states that the scheme *"must fulfil each of the above objectives".* This applies to both sets.

3.15 In Section 6.3 the issue of alternatives is considered. HBC/2/1P quotes the 2003 study as follows in 6.3.2,
"None of these options, taken individually or together, was considered likely to provide sufficient reductions in car journeys across the SJB. It was also considered that any reductions that were achieved would be negated by background growth in traffic over a few years."
The Proof goes on to discuss highway alternatives.

3.16 It is important to understand the source for this very strong dismissal of alternatives. In fact, CD 211 (para 8.2, page 22) clearly states that,
"No detailed studies of alternatives have been carried out."
Instead a "preliminary appraisal" was undertaken. The results are set out in a Table and it is said that,

"even a high level of investment and an impractically ambitious programme of improvement to the existing public transport systems would have only very small impacts on traffic levels and congestion on the SJB."

3.17 Ignoring the rather extreme language, the Table (8.1, page 23) does not show this at all. The comments in the Table simply reveal the total lack of proper modelling, but the numbers show individual items might reduce SJB traffic between 7.6% and 16.5%. The cumulative total is 49.6%. but it is clear that this would include serious double counting. Such an assessment actually shows that there could be significant relief, and the logical course of action was to investigate this further.

3.18 There are also two highly significant omissions from the appraisal. The first is that it did not model the impact of tolling the SJB with no new bridge on demand, including changing mode. The second is that it did not model the impact of policies such as company travel plans, home working and other initiatives, often called "Smarter Choices" either with or without tolls. These are specifically referred to in webtag Unit 2.3 "Policy Instruments" which says,
*"The information presented in this TAG Unit is a key input to the '**options for solutions**' step in the process."*

3.19 The revised traffic model, following DfT comments, is capable of including public transport alternatives; at least some of the policy instruments in webtag; and tolling. At the technical meeting with Gifford it was confirmed that no modelling of demand management options, with or without tolling, have been undertaken.

3.20 Insofar as HBC/2/1P relies on this "preliminary appraisal" to fulfil the requirement to treat alternatives seriously it should be disregarded. This absence of a proper alternative has not been remedied in the new modelling. Referring to the basic steps in the webtag guidance, it is clear that part of Step 4 was not undertaken (4.2 potential solutions) and most of Step 5 (Options for Solutions) could not be undertaken at all. In turn this means that all subsequent steps are defective.

3.21 CD 212, dated from 2007, contains a broad brush assessment of transit options, all of which assume a bridge is built. In fact, these options do not achieve value for money, although this was estimated using very simple assumptions and no detailed demand modelling. This is an important reference for the Mersey Gateway Sustainable Transport Strategy (MGSTS).

3.22 The MGSTS, dated February 2009, is CD 182 and is a key document for two reasons. The first is that a new bridge should only be justified within a clear transport plan – it should be part of the strategy rather than the reverse. The second is that the strategy should have a range of forecasts and model runs which enable its effectiveness to be tested, with and without various major infrastructure proposals.

3.23 Unfortunately the MGSTS fails to deliver either of these two key roles. First, it is described as a supplementary set of proposals to the bridge rather than a strategy within which the bridge proposal is justified. There is very little testing of public transport proposals other than the very simple table in CD 212, and this has been confirmed with the scheme proposers.

3.24 There are two important issues to be considered. The first is that the bridge proposal is by far the dominant investment in transport in the area. Toll income from highway users is focussed on providing new highway infrastructure, and, as discussed in the next section of the Proof, a majority of income until 2042 is not available to address social distribution issues or support alternatives.

3.25 Secondly, the public transport investments are outlined but not fully developed, tested or in any way guaranteed. They are additions to the specific bridge proposal, rather than providing a proper framework.

Inquiry Themes 1 & 3

4 Tolls, benefits and alternatives

4.1 The first point concerning the use of tolls is that the new bridge would generate significant amounts of car traffic if no tolls were in place. It should be noted that this is unlikely because the bridge could not be funded without them. This does mean, however, that the principle of tolling, in order to achieve transport improvements, is completely accepted by the proposers and indeed seen as necessary by them.

4.2 One very obvious way forward would be to test the imposition of tolls on the existing bridge and use the income to create a step change in public transport quality and cost. This would be possible because all the income would be available to the tolling authority rather than the vast majority (80%) going to the bridge construction consortium. There could be very low or even free fares for local residents, creating significant social distribution benefits in excess of the bridge proposal. This would occur because people with the lowest incomes have the lowest car ownership and are thus public transport "captives".

4.3 Further targeted measures could be taken to improve the position of low income households who used the SJB through reduced tolls. However, they would benefit most from public transport improvements.

4.4 It should be noted that there could be extra toll income to the tolling authority after 2042, when the private funding concession ends, but even in transport planning terms this is a very long way into the future and certainly not relevant to the modelled time period.

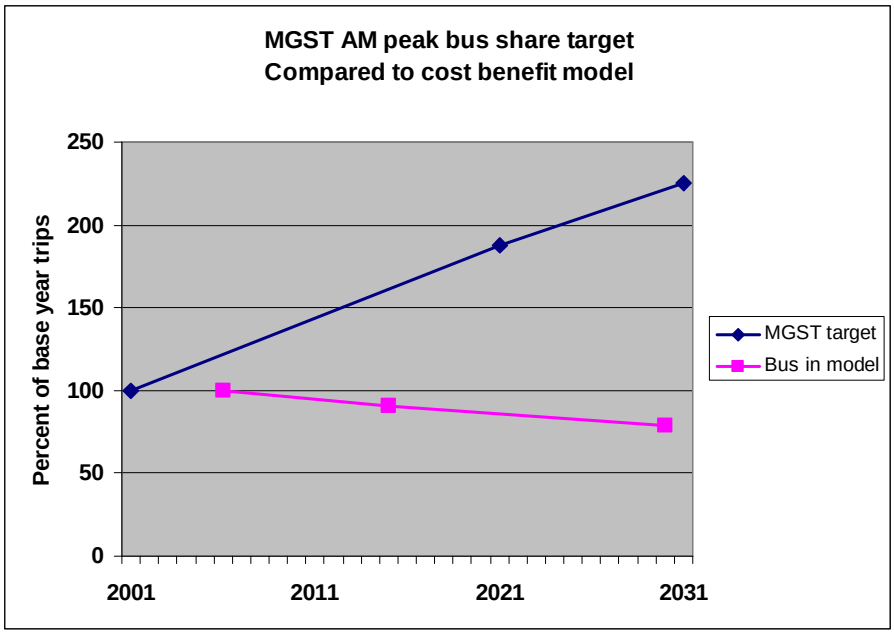
4.5 A second option would be to focus on public transport improvement and increased capacity without tolls. Much could be achieved by using the latest techniques of queue relocation and computerised signal control to protect buses from congestion, either at present or future levels. Funding could be an issue and fare reductions are unlikely to be possible.

In relation to fares, it is interesting that the modelling assumes an increase in bus fares of 64.7% between 2006 and 2030, and an increase in rail fares of 27% over the same period[1]. By contrast it assumes a reduction in car commuting costs of 33.5% and car business use of 15.8%[2].

4.6 No analysis or testing of such alternatives, which have the potential to achieve a number of Government objectives, has been undertaken.

4.7 Indeed, there appears to be a contradiction between the outcomes which would be used to measure the success of the MGSTS and the predictions of the transport model. In Table 4.2 of the MGSTS (page 100) one target is to increase bus mode share for commuting from 8% in 2001 to 18% in 2031 (up by 225%). However, the model assumes a 10.9% fall in bus trips between 2006 and 2030 in Halton[3]. The variable demand model appears to show a further 5.4% decrease[4], but this is only for trips crossing the Mersey. This is illustrated in Figure 2.

Figure 2



1 MG Forecasting Report, Table 3.5
2 MG Forecasting Report, Table 3.4
3 MG Forecasting Report, Table 4.5
4 MG Forecasting Report, Table 6.35

4.8 Following the clarificatory questions, it has been confirmed that a sensitivity test for 2015 was undertaken for the Do Minimum which included all public transport trip times in the variable demand model. This predicts significant reductions in public transport use. It shows a similar direction but slightly higher levels of reduction. This is shown in Table 1.

Table 1

Whole network reductions in public transport in 2015

	Peak hour	Inter-peak hour	PM peak hour
Total 2006	32,588	16,843	28,383
2015 VDM	29,146	13,547	24,620
% change	-10.6%	-19.6%	-13.3%

4.9 In relation to the MGSTS, if the model had contained the proposals, they would have been a complete failure. Following the technical meeting, it is clear that they are insufficiently developed to be modelled and are therefore not included in any option. Thus the Do Minimum is lacking in public transport improvement and there has been no testing of an alternative based on public transport, or public transport plus tolling with no new highway capacity.

4.10 For this reason, the Do Minimum does not represent *"the minimum necessary to achieve Government objectives"*. This in turn makes the preparation of a genuine alternative against which to assess the performance of the bridge proposal absolutely critical.

What could an alternative deliver?

4.11 While the promoters have not provided any development or testing of a proper alternative, the evidence does allow for some indications of what could be possible. This would use the same policy instruments as those presented to the Inquiry, plus the missing elements of a travel planning and Smarter Choices package.

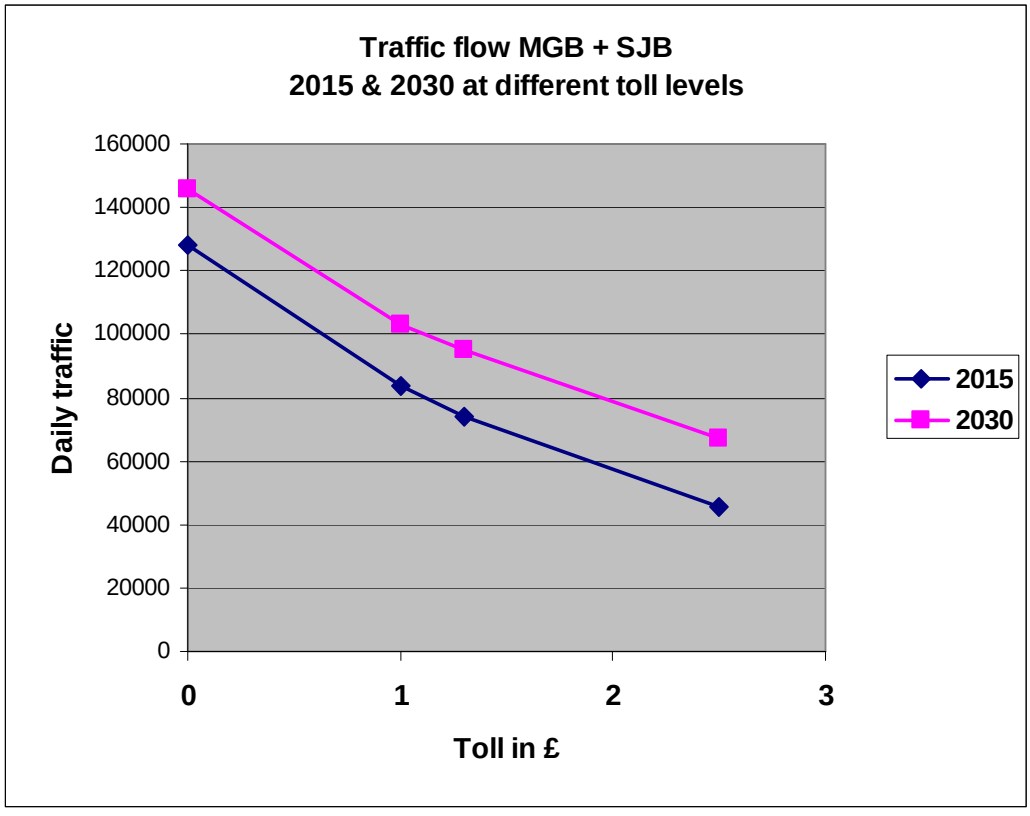
4.12 For the purposes of this assessment we have assumed that tolling would be introduced on the existing bridge without a new road crossing. Since there is no concessionaire the income will be controlled by the local authority. This would then fund a range of improvements including:

- Reductions in local bus fares and improvements in services
- Specific toll discounts for local residents and local businesses
- New generation bus priority (queue relocation)
- Intensive "Smarter Choices " package
- New facilities for walking and cycling

All of this appears compatible with the aspirations of the MGSTS.

4.13 The effect of tolling alone is indicated in Table A7.3 of Mr Pauling's Proof. Looking at the SJB and MGB combined, in 2015, at the "Most likely" level of £1.30, the reduction is 20,031 vehicles. At £1.00 this falls to 10,494, and at £2.50 it rises to 48,519. With no toll there would be an increase of 34,093. The effect of tolls in 2015 and 2030 is shown in Figure 3 below.

Figure 3



4.14 This indicates a high sensitivity to tolls below £1 and means that any substantial concession, for example 50% discount, would have a major impact. Looking at Appendix 1, HBC/08/2A it is clear that the proportion of local traffic which crosses the SJB is high, crossing trips less than 3 kms are over 30% and trips over 6kms over 70%, although this will vary by time of day. Using the toll income chart from CD 197, a 50% discount could absorb all the income from the SJB at around 35% of users.

4.15 However, this would be compensated for in part by an increase in users, attracted by the cheap tolls. The evidence for this is contained in Figure 3 above. This would in turn increase pollution and congestion. This is a simple estimate, for example without the re-routeing between crossings. Nevertheless it shows that the application of toll discounts would have a major impact on the assessment results and could be expensive for the promoter. If the toll income is part of a locally controlled Sustainable Strategy, and does not have to fund the major expenditure on the new highway crossing, this problem can be avoided. Even with a discount the toll income without the new bridge could be significant, in the range £15-20million. All this should have been modelled.

4.16 The above figures for the traffic reduction impact of tolls are in the context of strongly rising public transport fares. Reducing bus fares so that they are always noticeably less than the discounted toll would also have a major impact. The social benefits would be great, since bus users are dominated by lower income groups. The bus user profile would of course change as higher earners switched to public transport. In fact, the lowering and simplifying of fares, combined with improved services, can create major increases in bus use. Figure 4 illustrates the point for London. This has been achieved by a step change in service, a small reduction in fares but also a major simplification and wide social discounts, plus the central area congestion charge. In contrast, PTE areas have suffered a doubling of fares per passenger, reductions in service and no integrated approach. The results are shown in Figure 5. Both Figures are based on Transport Statistics GB 2007.

Figure 4

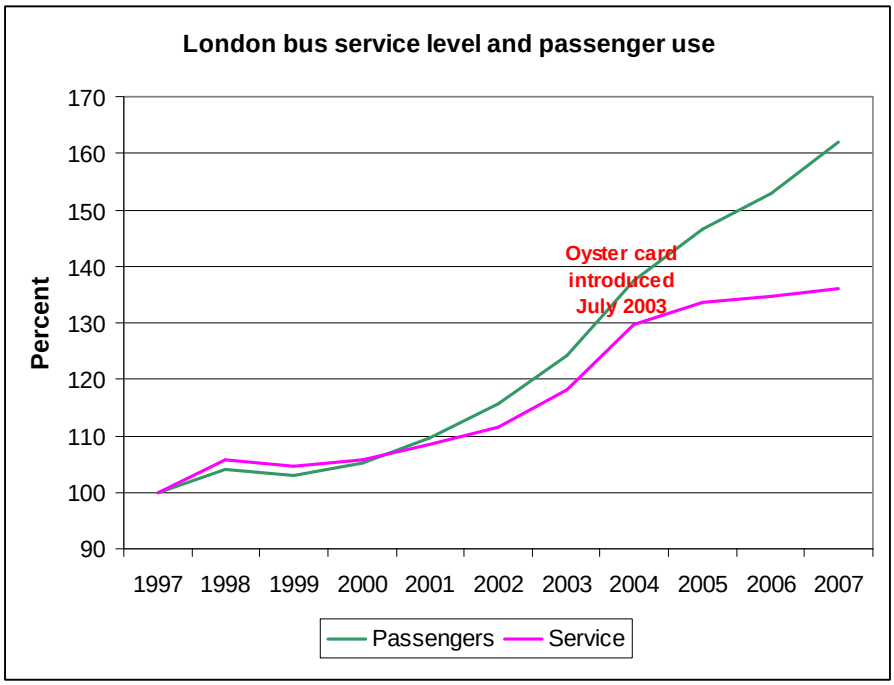
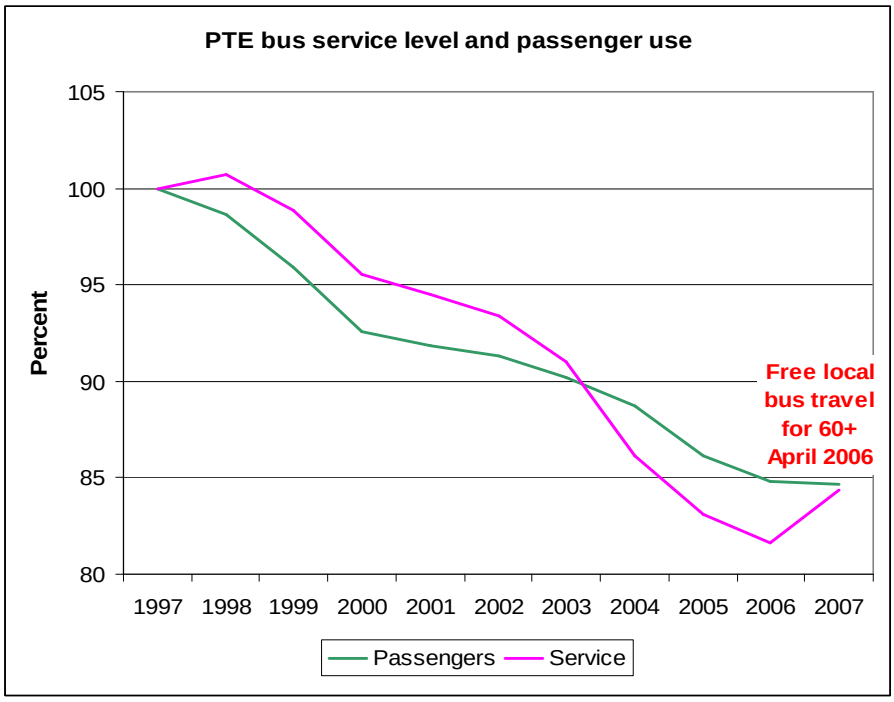


Figure 5



4.17 It should be noted that analysis such as this supported the recent reforms in the Transport Act 2008, which will mean that PTEs can seek to replicate the London improvements, at least in part.

4.18 The success of "Smarter Choices" needs to be understood in the context not only of public transport improvement, but particularly walking and cycling. Instead of starting with top down infrastructure, the approach is to make people aware of what is available, and then derive from them what is required to achieve further change in travel behaviour. The Government funded "Sustainable Travel Demonstration Towns"[5] is the most recent in a series of projects which have proved the value of this approach. If tolling with no new bridge were progressed, there would be more than sufficient funds to provide a travel planning package of the highest quality.

4.19 Rather than opportunistic network infrastructure provision, the increases in non-motorised modes have been built from the ground up. This is more effective and usually costs less. It is neither sensible nor cost effective to proceed with infrastructure separately from the travel planning approach.

Social distribution impacts

4.20 Given the local problems it is right to focus on which groups are advantaged and disadvantaged by the proposal. It is equally important that aspirations in relation to public transport improvement, or in relation to discounted tolls for local people, are dealt with in a robust manner.

4.21 However, there is no analysis of which income groups benefit or disbenefits from the impact of the MGB plus tolls. This has been confirmed in the technical requests process. At least such figures should be available for the three income groups for commuting which are used for calculating the scheme benefits.

---

[5] Inter alia see: http://www.dft.gov.uk/pgr/sustainable/demonstrationtowns/sustainabletraveldemonstrati5772

4.22 It is the case that the effects are recognised in general terms in paragraphs 18.43 to 18.45 in HBC/8/1P page 137, for example:
"I conclude that the Project, by dissuading lower value trips from travelling, particularly in the peak periods provides increased road space for higher value, generally business related, trips." (18.44) and:
"Improvements to public transport, through the catalyst of the Sustainable Transport Strategy, have the potential to provide a realistic alternative mode of travel to those lower value trips dissuaded from travelling by private car"

4.23 To summarise, it is recognised that lower income users will be deterred by the scheme, although this is not quantified. To compensate it will be necessary to introduce public transport improvement but this is undefined, untested and not part of the Project as presented to the Inquiry. This is one example of the use of the word "potential" and the reliance upon policies not yet developed to achieve social and other benefits. This is clear in the Social Impact Proof, HBC/10/1P, Section 8. The Conclusions to this Proof, Section 13, are based upon the Sustainable Transport Strategy and the Regeneration Strategy being implemented as well as the tolling discounts. An assessment should have been made without the MGSTS and tolling discounts.

4.24 In fact, there are no specific proposals for toll discounts before the Inquiry. Nor are there any tests of the impact of such discounts. These would be considerable, given that the toll is the mechanism for avoiding traffic generation and an even greater rise in carbon emissions. It is also the mechanism for funding the bridge and thus any reduction in toll income will require a compensating payment to the concessionaire. This in turn will reduce the money available for public transport, walking, cycling and any improvements to the SJB. If the full details of any agreement are not yet in place, a reasonable estimate could easily be made. The evidence before the Inquiry is already based on a series of assumptions about toll levels, rather than a specific agreement.