ECONOMIC

Summary Proof of Evidence by
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for the
MERSEY GATEWAY PROJECT
PUBLIC INQUIRY

on behalf of
The Alliance
comprising
the North West Transport Roundtable

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Mersey Gateway Bridge Inquiry

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1 Introduction

Qualifications

1.1 My name is Alan Wenban-Smith. I hold the degrees of MA (Cambridge), MSc (Toronto) and DipTP (Newcastle) and am sole proprietor of the Urban & Regional Policy consultancy. I am a member of the Royal Town Planning Institute (MRTPI), and currently a member of the RTPI General Assembly and its Policy & Practice Committee. I am Visiting Professor of Planning at Birmingham City University.

Commission

1.2 I have been commissioned by the Alliance of the NW Transport Activists Roundtable and Friends of the Earth to review the economic and regeneration case for the Mersey Gateway Bridge.

Structure

1.3 The next Section of my evidence derives a set of headings for a critical examination of the regeneration case. Section 3 reviews the economic and regeneration appraisals in this light, and Section 4 draws conclusions from this analysis.

2 DfT guidance on appraising economic benefits

The basis of appraisal

2.1 The Treasury ‘Green Book’ is the ‘Bible for project appraisal in the public sector. It mandates a process that starts with a clear statement of the rationale for public intervention and the outcomes sought, puts forward practical options for achieving these outcomes, appraises these in terms of value for money, and finally monitors and evaluates the actual results.

2.2 DfT Transport Appraisal Guidance system – WebTAG\(^1\) – is an extensive, sophisticated, elaborate and evolving system, based on the Green Book and currently comprising 96 separate modules, 10 of which are

\(^{1}\) the DfT’s web based Transport Appraisal Guidance system at [www.dft.gov.uk/webtag/](http://www.dft.gov.uk/webtag/)
consultation drafts (including two particularly relevant to this Inquiry posted in April 2009).

**Evolution of appraisal guidance**

**Direct benefits (congestion, time savings and accidents)**

2.3 Until the 1999 SACTRA Report 'Transport and the Economy' the overwhelming bulk of economic benefits of transport were considered to comprise the user time-savings from reduced congestion. The SACTRA report pointed out that these time savings would usually be lost as patterns of activity changed "... in general, the value of direct transport benefits must decline if indirect economic benefits are to grow". However, in a perfect market the benefits of the new pattern of activity would be of equal value to the original time savings.

2.4 When the 2003 Green Book replaced its predecessor, the period over which costs and benefits needed to be considered was increased from 30 to 60 years, and the discount rate (the annual reduction in the present value of costs incurred or benefits won in the future) was reduced from 6% to 3-3.5%. This adds enormously to the weight that is placed upon the numbers provided by long term forecasts.

2.5 Reviews of forecast traffic against actual outcomes show that after five years 'induced traffic' becomes more significant and that conventional transport models systematically underestimate traffic growth. This is a symptom of the new travel patterns that result from new or improved roads.

2.6 Since WW2 there has been a four-fold increase in overall travel per head. But within this vast increase the number of trips per head has changed very little, and around 2/3rds of the increase in personal travel is the result of longer trips. Associated with these longer trips has been an even more striking increase in the proportion of travel being undertaken by car – which has increased by a factor of 10.

2.7 These effects are a consequence of a more dispersed pattern of activity, driven by economic and social pressures and enabled by transport.

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2 WebTAG 2.8 ‘Wider Impacts and Regeneration’, and the related ‘expert’ paper WebTAG 3.5.14
3 SACTRA (1999), 'Transport and the Economy', para 23
4 referred to in WebTAG 2.7.1, para 1.8.6
improvements. In any one year, around 90% of this change in patterns of activity and location takes place through the turnover (‘churn’) of the existing stock of buildings, which offers about 10 times the volume of choice of new build (and a much wider range of locations).

2.8 The changes in locational choices by households and businesses since WW2 have been increasingly influenced by the dominance of road transport. The symbiotic relationship of transport and urban change has important economic and social consequences, but the first point to note is that transport supply is a major and dynamic driver of transport demand. Roads have become dominant, and further provision fuels further increases in dominance.

**Indirect benefits (regeneration and economic growth)**

2.9 The 1999 SACTRA Report concluded that in a perfect market conventional CBA would capture all the economic costs and benefits at national level. However, in imperfect markets, such as are generally found in the real world, there may also be ‘wider economic benefits’ (WEBs).

2.10 Formal current DfT guidance is contained in WebTAG Unit 3.5.8 (2003) and does not include the potential for net economic change that WEBs imply. It required an Economic Impact Report (EIR) for major transport schemes to establish whether there is redistribution of a fixed total of jobs into or out of Regeneration Areas (RAs), in recognition of the potential social impact. For RAs to be valid for this purpose they should normally be designated in the relevant Regional Economic Strategy.

2.11 The Eddington Report pointed to the need for an overhaul of the transport appraisal system, so as to give more prominence to the wider economic effects that should drive investment priorities in the sector. In parallel with Eddington, changes to the appraisal process have evolved, starting with a Discussion Paper in 2005. However, formal guidance is still under consultation, the subject of draft WebTAG units posted in early April 2009.

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6 WebTAG 2.8 ‘Wider Impacts and Regeneration’, and the related ‘expert’ paper WebTAG 3.5.14 ‘The Wider Impacts Sub-Objective’
2.12 In addition to effects derived from user time savings in a perfect market, WEBs arise from agglomeration, competition and labour market effects in an imperfect market. The main changes from earlier guidance concern the increased prominence given to the potential for transport interventions to lead to additions (or reductions) in the overall level of economic activity. This is what is meant by ‘WEBs’.

**Summary of key issues**

2.13 This leads me to the following headings for reviewing the Economic Appraisal Report (EAR) and the Wider Economic Impacts Report (WEIR):

a) Reliability of time savings as a measure of direct impact;

b) Conversion of time-savings to non-transport impacts;

c) Wider Economic Benefits;

d) The definition of RAs and the likelihood of benefits to them;

e) The overall balance between costs and benefits.

3 Economic Appraisal & Wider Economic Impact

1. Time savings as a measure of direct impact

3.1 The EAR provides the basis of the user time and accident savings used in the WEIR. The key issues here are:

a) The validity of using the same ‘land-use’ when comparing transport performance with and without the MGB in the 2015-2030 modelling;

b) The validity of the assumption of no change in traffic levels from 2030 onwards;

c) The effect of this assumption on the robustness of the estimate of NPV; and

d) The inadequacy of the sensitivity tests carried out.

(a) The constant land-use assumption

3.2 The use of the same land-use matrix when comparing delays to traffic with and without the bridge exaggerates the time savings attributed to the MGB, since part of the demand assigned to the ‘Do minimum’ network will not arise without the MGB. The ‘constant land-use’ assumption is common practice, and may not produce a large error where the claimed regeneration effect is small, but that is not the case here.
3.3 When this issue arose at the Thames Gateway Bridge Inquiry the Inspector concluded that since transport and land-use will undoubtedly interact, the failure to consider alternative land-use scenarios or to use a Land Use/Transport Interaction (LUTI) model “… detracted further from the reliability of the promoters predictions”. 7

(b) Traffic levels after 2030

3.4 The fact that the transport model (MGM) cannot accommodate changes in patterns of locational choice by households and businesses consequential on the introduction of the MGB is a serious defect. New development provides only a small proportion of the scope for change, and the evidence is that over periods over more than ~10 years improvements in accessibility are a major driver of dispersion, generating increased travel demand and more car-dependency. Traffic will therefore increase faster than the MGM predicts.

3.5 The main countervailing influences are the imposition of tolls and the concurrent pursuit of urban regeneration policies in the Mersey Gateway area. However, tolls at a high enough level to counteract the effect of user time-savings on travel demand would also reduce both the direct net user benefits and the indirect WEBs.

3.6 It might be argued that higher levels of traffic on the MGB and in the Mersey Gateway area generally would be a price worth paying for the improvements to the financial balance for the MGB operator, and the higher levels of economic activity with which more traffic might be associated. Against this we should note:

a) The high priority given by DfT’s current policies to combating climate change; and

b) The potential for dispersion to undermine both the economic agglomeration and the urban regeneration effects being sought.

3.7 This outcome would also be symptomatic of a failure of the effort to regenerate the Mersey Gateway area – effectively continuing the long tradition of major road schemes in Greater Merseyside which have undermined its economic cohesion and critical mass.

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7 Thames Gateway Bridge Inquiry – Inspector’s Report (Aug 2006), this issue is fully discussed in paras 9.281-286
3.8 Without the assistance of a LUTI model these issues cannot be explored much further, but the implications for the robustness of the appraisal are potentially very serious, as I will discuss.

(c) Robustness of the NPV estimate

3.9 The time savings benefits of the MGB are estimated from the difference between model runs with and without it. Since the speeds and flows of traffic for the 45 years of the appraisal period remaining after 2030 are based upon ‘no change’ from that date, the quantity of time-savings at that date is crucial. The income to Halton BC from the end of the concession (34 years from 2042) is similarly dependent on this flow level.

3.10 I have already given reasons for believing that the time savings attributed to TGB have indeed been exaggerated. If higher general levels of traffic were to result from land-use changes in the modelled period (2015-2030), the exaggeration would increase.

3.11 But the greater part of the distortion relates to the period after that modelled (after 2030). This will have a major effect on the user benefits because any exaggeration of time savings at 2030 is increased by the 45 years that the appraisal period still has to run from 2030. Since the discount rate for benefits (3.5% pa) and the assumed growth in the value of time (~2.0% pa) counteract each other, the multiplier to be applied to any error would be over 30 times.

3.12 It is likely that a substantial proportion of the estimated benefit relates to a period for which there are no modelled results (and for which, if there were modelled results, they would be unreliable).

3.13 However, this information would only tell us the degree of dependency of the estimate of time-savings benefits on the ‘post-modelled period’, and so something about its robustness. The scale of the distortion that is introduced depends upon information about changes in spatial patterns of economic activity and residential choice which cannot be estimated without a LUTI model.

3.14 The value of the toll revenues accruing to Halton BC after the concession period (i.e. from 2042-2074) is similarly dependent on the accuracy of the predictions for 2030, though since the period to run is shorter (33 years)
and there is no real income growth assumption to set against the 3% discount rate, the relevant multiplier would be over 20 rather than around 30.

3.15 In this case the extra traffic likely to be predicted by a LUTI model would tend to increase the financial benefit to the MGB operator (the concessionaire and then Halton BC) but at the cost of increasing the amount of tolls paid by bridge users, the volume of CO₂ emissions and other environmental impacts.

3.16 Both the costs and benefits given in the EAR (Table 3.1) are critically affected by these considerations, with serious implications for the robustness of the estimates of NPV and Benefit/Cost Ratio (BCR):

a) Most of the net benefit to users is the difference between the value their time and Vehicle Operating Cost savings (£847m) and the toll charges they pay (£626m). The positive NPV is the relatively small difference between these numbers, each of which is vulnerable to major errors. As I have indicated, time savings are likely to be much lower and toll payments higher, which could easily wipe out any benefit;

b) The net public sector cost (£73m) is the difference between public sector costs – £300m much of it up-front – and toll revenues received by Halton BC after the end of the concession in 2042 (£228m). Once again both numbers are independently vulnerable to major errors. Though the financial outcome for the concessionaire and Halton BC as bridge operators may be enhanced, this would come at the expense of the users and the environment.

(d) Sensitivity tests

3.17 These points represent major risks to the favourable CBA outcome presented by promoters. However, the only sensitivity test reported is the use of local values of time in place of national, which makes only a trivial difference to the estimated net benefit. This is not compliant with WebTAG advice, which contains numerous and extensive warnings and guidance on the subject.

3.18 As well as not meeting DfT requirements, it is also clear that there are indeed major risks to the estimated benefits. This deficiency carries
through to the WEIR economic and regeneration estimates that depend upon the transport model results8.

**Conversion of time-savings to wider impacts**

3.19 In general, accessibility improvements are converted to changed locational preferences and their value declines over time. In a perfect market the new pattern of land use will be of equal economic value to the initial transport benefits, but it does not follow that it will be of equal policy value, since regeneration has social and environmental, as well as economic, dimensions.

3.20 The transport benefits may well not convert to economic and social benefits of equivalent value. In Merseyside, in particular, the benefits of past improvements in road transport have been distinctly double-edged, with the price of increased accessibility being a loss of economic ‘critical mass’. It is not possible to place a value on these effects in the absence of LUTI modelling, but two points should nevertheless be noted:

a) The user benefits reported in the EAR, may be significantly reduced in value by their conversion into locational changes unfavourable to regeneration;

b) Where direct user benefits convert into favourable locational changes, care is required in estimating the WEBs to avoid double counting.

**Wider Economic Benefits**

3.21 WEBs are dealt with in WEIR Chapter 7, which discusses Eddington’s seven ‘micro drivers’ of productivity, three of which are assigned money values:

a) Business efficiency (£222m);

b) Clusters and agglomeration (£67m);

c) Increased competition (£22m);

**(a) Business efficiency**

3.22 At £222m this is by far the largest component, being simply the modelled business user benefits from the EAR. As I have already discussed, the lack of adjustment for the land-use effects of the changed accessibility offered by MGB mean that benefits will have been over-estimated, with

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8 the sensitivity tests of numbers of jobs from regeneration in the WEIR address a different issue and do not compensate for this deficiency
the discrepancy increasing over time and further compounded by the long appraisal period and low discount rate.

3.23 Virtually all the benefit of MGB accrues to business users (£222m: £472m benefits - £250m tolls), mainly because business users’ time is much more highly valued. The balance for ‘consumer users’ is much closer (£7m: £376 benefits - £368m tolls), and therefore even more susceptible to error. Taking this into account a large negative balance for ‘consumer users’ is very likely. This is an economic welfare issue in Green Book terms.

(b) Clusters and agglomeration

3.24 There are several reasons for regarding the result (£67m) as being (at best) only indicative, and likely to be on the high side. In particular:

a) The tendency of firms to take advantage of accessibility improvements to relocate in a more dispersed pattern will reduce any initial gains in effective density over time;

b) The effect of tolls is to increase the costs of interaction, again reducing effective density;

c) The elasticities relate to national figures, and may well not be representative of Greater Merseyside.

(c) Increased competition

3.25 The estimate here is simply 10% of the business travel benefit, or £22m. As with the business user benefit and the agglomeration benefit, it therefore depends upon the accessibility improvement being maintained, which as I have already said is unlikely to be the case.

Benefits to Regeneration Areas

3.26 The direct transport benefits and the WEBs are in principle estimated net increases in national welfare. ‘Regeneration’ represents a distinct and separate dimension in that (in principle) it values benefits to RAs more highly than equivalent benefits elsewhere (thus a transfer of jobs from outside an RA to within it with no net increase would qualify as a regeneration benefit) – provided the Regeneration Area is appropriately designated.
Definition of RAs

3.27 While the ‘Second Mersey Crossing’ is identified as one of 45 ‘Transformational Action’ within the RES for the North West, the RES does not designate a Regeneration Area in the terms required by WebTAG.

Potential for benefits to deprived areas

3.28 While the RA defined is not compliant with official guidance, it does provide a means of considering the impact of MGB on the most deprived areas, and this may be valuable.

3.29 The methodology used relies upon improved accessibility (above a 10% threshold) as the principal measure of increased job opportunities for RA residents. However, there is no information about how the proportion of suitably skilled people with improved access that actually win the jobs was estimated. Without this it is difficult to say whether or not the numbers are credible.

3.30 A further issue concerns the attribution to MGB of 25% of the overall totals of jobs arising from the overall Mersey Gateway Regeneration programme. No rationale is offered for this estimate.

3.31 Each component of the jobs estimated is open to objection or question:

a) New jobs in the hinterland (3030): the use of a 2.6x multiplier on new jobs in the RA is extremely dubious: many of the regeneration projects are well down the supply chain and would have lower multipliers (especially retailing);

b) Existing jobs won in hinterland (654) and RA (1118): these estimates depend upon the success rates assumed, and on the validity of a non-LUTI transport model in a situation which demands one;

c) New jobs in RA and hinterland won (1195): the same comment applies;

d) Jobs lost to RA residents from better access from hinterland (-1309): The balance depends upon whether RA residents are more or less successful than hinterland residents. The impact of toll charges on low income job-seekers could be significant;

e) Wage competition (0): the relatively low wage rates assumed reinforce the points about multipliers and toll charges.
f) Retail competition (0): gains in one part of the RA will tend to be offset by local losses. This should be a negative number.

g) 1000 jobs lost in redevelopment (−50): small firms affected by redevelopment are often ‘hanging on’ in temporary premises. I would expect a casualty rate of ~50% or 500 jobs lost

h) Displacement of 50% existing jobs by inward investment (−375): it is not clear which 750 inward investment jobs being counted here

**Net effect on RA residents (+1233):** The net effect seems likely to be at least 500 lower for redevelopment alone

3.32 In summary, little reliance can be placed upon the estimates of employment benefit to RA residents. Direct losses of jobs from redevelopment, in particular, are likely to be much higher; the multipliers used seem excessively generous; and there is a lack of information about the crucial assumptions on penetration rates. In addition, the accessibility information on which it all depends is derived from an inappropriate type of model for the scale and significance of the results being claimed.

3.33 RA residents either side of the Mersey are intended to be amongst the main beneficiaries of the increased cross-river capacity. However, even if additional jobs were forthcoming on the scale suggested, access to them from those on the lowest income would be inhibited by the cost of tolls on both the existing SJB and the new MGB. Those at present using the SJB toll-free would be placed in a markedly worse position.

3.34 While rebates and exemptions might help address this problem, complex procedures will be necessary to ensure appropriate targeting, and these can in themselves create barriers for new or marginal labour market entrants. Improvements in public transport provision might help, but the trend towards a more diffuse pattern of employment (to which TGB will contribute) will limit the range of beneficiaries⁹.

3.35 In my experience, benefits to the most marginal entrants to the labour market, and to the most deprived communities, are associated with improvements to public transport accessibility rather than cars. In this connection Dr Twigger-Ross points specifically to the problems arising

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⁹ Analysis of the MGM results by Keith Buchan suggests declining public transport use
from poor public transport across the SJB, but rather surprisingly, in the light of this, she does not mention public transport in her lengthy discussion of access to the additional jobs projected by the WEIR.

3.36 In summary, my view is that the money estimates of economic and regeneration benefits are too high and not robust, for the following reasons:

a) **Direct business benefit from increased transport efficiency (£222m)** is the estimated difference between MGB business user benefits and tolls. This depends on constant land-use from 2015-2030, and then maintenance of time-savings for 45 years from 2030-2074; it takes no account of reduced time savings and increased toll take as a result of the extra traffic generated by land-use change;

b) **Direct consumer benefit from increased transport efficiency (£7m)** is the difference between MGB consumer user benefits and tolls. The same criticisms apply;

c) **WEB – Clusters and agglomeration (£67m)**, the result of improved accessibility. This depends on initial accessibility benefits being maintained, rather than eroded by locational changes;

d) **WEB: increased competition (£22m)** estimated as 10% of direct benefit, and so subject to the same criticisms;

e) **Regeneration (1233 net new jobs won by RA residents)**. Access to jobs depends on non-LUTI model; allocation of benefits to MGB, multiplier and penetration rates not explained or justified; effects of redevelopment understated.

4 Conclusions

4.1 I conclude that the economic and regeneration case put forward by the promoters of MGB is substantially overstated, for the following reasons:

**Direct transport efficiency benefits**

a) The transport model underestimates traffic flows in the Study Area because (as a non-LUTI model) it cannot deal with the dynamic effects of the MGB itself on land-use;

b) This discrepancy will already be significant by the end of the modelled period (2030) and increase throughout the appraisal period (to 2074);

c) The effect of this systemic deficiency is to over-estimate the user time savings between the ‘do nothing’ and ‘do something’ scenarios;
d) It also has the effect of under-estimating the aggregate values of the tolls paid – by both business and consumer users;

e) By far the greatest part of the benefits is the difference between the value of user time savings and tolls paid. This relatively small difference between these two large numbers is highly sensitive to their estimated values;

f) The estimated NPV of benefits is therefore not robust and is likely to be substantially too high.

**Wider Economic Benefits**

a) The cluster and agglomeration benefits claimed depend on the aggregate effect of individual businesses’ locational choices being such as to maintain initial accessibility benefits. In practice these are more likely to be eroded over time;

b) Benefits from increased competition depend on the same factors as the direct transport efficiency benefits, and are subject to the same criticisms.

**Regeneration Benefits**

a) The regeneration benefits are related to an area which does not meet the requirements of WebTAG in terms of designation in the RES;

b) The estimates of jobs gained by the residents of this area depend on high multipliers applied to new RA jobs to estimate additional jobs in the hinterland;

c) Assumptions about the relative success of RA and non-RA residents in winning both existing and new jobs are unsubstantiated;

d) An optimistic view is taken of the likely success of relocation of directly affected businesses;

e) The allocation to MGB of 25% of all jobs created by the Mersey Gateway regeneration is not substantiated and seems generous.

4.2 All the above deficiencies are compounded by the absence of appropriate sensitivity tests, in accordance with good practice and DfT guidance.