Transport and the economy: Government response to SACTRA report

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Introduction

1. In 1996 the then Secretary of State invited the Standing Advisory Committee on Trunk Road Assessment (SACTRA) to consider the effects on the performance of the economy arising from transport projects and policies.

2. The Committee was asked to produce an Interim Report for December 1997 to assist the Government in drawing up the White Paper 'A New Deal for Transport: Better for Everyone', July 1997.

3. The full SACTRA report on 'Transport and the Economy' (SACTRA, 1999) was published in August 1999. The Department indicated that, as with previous SACTRA reports, there would be a government response to the recommendations in the report.

4. References here to the Department refer to the Department of the Environment, Transport and the Regions.

Background

5. For any public policy decision, including transport issues, appraisal is a means of informing public policy decisions. Appraisal is based on a comparison of all the costs and benefits of a policy change. The aim is to compare all the benefits and costs for all the options under consideration. Policy makers can be provided with this information which can be taken into account along with other factors including the available funding.

6. These appraisal methods apply to road infrastructure, but also to all decisions on public transport where direct government financial support has been provided in order to reflect the wider costs and benefits. It is also the basis for a wide range of policy decisions on transport, such as the case for measures to improve transport safety.

7. The Government has developed a new approach to appraisal (NATA) which was drawn up to assist in the Roads Review and for use in appraisal of all future road investment schemes by the Highways Agency, local authorities and others. The approach works within a broad framework of the five objectives of accessibility, safety, economy, environment and integration set out in 'A New Deal for Trunk Roads in England' (DETR 1998a; 1998b; 1998c).

8. 'A New Deal for Trunk Roads in England' proposed a series of studies to address problems on the strategic trunk road network not addressed in the Targeted Programme of Improvement being taken forward over the next seven years. These problems are being considered by a series of multi-modal and roads-based studies led by the Government Offices. The results will assist the regional planning bodies in developing regional transport strategies. These strategies would in turn inform decisions about improvements to the trunk road network. Work began on the first 11 of these studies during 1999-00. The rest will start in 2000-01. The first studies will report in 2001.

9. An Appraisal Summary Table (AST) sets out simply and concisely using the five objectives the key consequences of different options for tackling a particular problem. The costs and benefits are based on established techniques to assess the environmental, economic and social consequences of options. The approach is based on the modelling of traffic, changes in road capacity, monetary values of time and accident savings (usually carried out using COBA or URECA for major road schemes) and the Environmental Impact Assessment which is used to assess the positive and negative environmental impacts. The AST brings these together to give a fair and unbiased overall description, without giving prominence to any one type of effect or to benefits expressed in monetary terms compared with those which cannot be monetised. The AST does not replace the extensive cost benefit, financial impact and environmental impact analyses undertaken in the past, but aims to package their results so that they are

more accessible to decision makers. Considerable emphasis is given to the need for the summary information to be evidence-based, rather than subjective. The AST includes an allowance for the assessment of the regeneration impact of transport schemes.

10. As indicated in the Integrated Transport White Paper, NATA has been enhanced to be applicable to transport investment for other modes. It forms the basis for the shadow Strategic Rail Authority's guidelines for the appraisal of support for rail services, and the enhanced version of NATA will enable the impact of new policy measures such as road user charging to be clearly understood.

11. In Guidance on the Methodology for Multi-Modal Studies (GOMMMS) the approach has been broadened to provide additional information. Alongside the AST, as described above, it includes an assessment of performance against any additional local objectives and an assessment of the extent to which the problems identified would be mitigated. It also includes supporting analyses of distribution and equity, affordability and financial sustainability, and practicality and public acceptability. Guidance on the Methodology for Multi-Modal Studies (DETR, 2000) develops the NATA into a multi-modal appraisal framework.

12. The SACTRA recommendations offer an opportunity to develop the broad range of factors already in the NATA. For example, on regeneration effects, the NATA only provides a method to establish whether a scheme has the potential to assist with the regeneration of a target area while SACTRA propose a more detailed economic impact report.

The SACTRA Report: Main Findings

The Key SACTRA Questions

13. The SACTRA report addresses four main questions:

- Do transport improvements lead to increased economic activity?
- Is it possible to 'decouple' growth in traffic levels from growth in the economy, in order to obtain the positive benefits of greater wealth, while reducing some of the negative effects of congestion and environmental impacts?
- Are economic impacts fully captured in the procedures for estimating benefits and costs currently used by the Department of the Environment, Transport and the Regions?
- What recommendations follow for the Department's procedures and practice for transport appraisal?

SACTRA's Main Findings

14. The committee's conclusions in answer to these four questions are:

Do transport improvements lead to increased economic activity?

15. There are strong theoretical expectations that all or a part of a transport cost reduction will lead to economic impacts outside the transport sector but the empirical evidence of the scale and significance of such impacts is weak and disputed. Conclusions about the effects of transport on the economy are strongly dependent on local circumstances.

Is it possible to 'decouple' growth in traffic levels from growth in the economy, in order to obtain the positive benefits of greater wealth, while reducing some of the negative effects of congestion and environmental impacts?

16. This question can be taken in three parts: (i) whether the income elasticity of demand for transport services declines as transport use increases; (ii) the case for policy instruments influencing the volume of traffic; and (iii) if policy can influence traffic, whether or not this will have a favourable or unfavourable economic effect. The SACTRA report focused on parts (ii) and (iii).

17. Income growth has a strong influence on traffic growth, as do other factors such as price, speed and the quality of transport. For a particular level of economic activity, it is feasible, in principle, and quite simple in practice to develop policies to change the volume of traffic.

18. There are conditions where measures to control traffic will raise transport prices but still have a favourable local or national impact. There is empirical evidence on the sensitivity of traffic levels to cost changes but not on the effects on economic performance at a national level. The optimum level of traffic reduction (or increase) to aim for will vary according to the circumstances and should therefore be the subject of cost benefit appraisal.

Are economic impacts fully captured in the procedures for estimating benefits and costs currently used by the department of the environment, transport and the regions?

19. The underlying assumption in the appraisal of most transport schemes is that direct cost and benefits to transport users (primarily due to time savings, operating costs and accident reduction) and to non-users (environmental and other factors) will give a complete estimate of the value of a transport policy measure such as a new infrastructure or a traffic reduction measure.

20. There are some circumstances where the measurement of costs and benefits may be improved or require a different approach, including:

- incomplete valuations in the appraisal methods (notably, freight and business travel, the value of time and reliability); and
- imperfections in the economy (price distortions from competitive levels and external costs such as congestion and environmental damage).

21. There may also be a need to measure the spatial distribution of the value of any transport policy measure. The spatial effects of a transport improvement may not benefit location at both ends of the route, and the 'winners' and 'losers' should be considered separately.

What recommendations follow for the Department's procedures and practice for transport appraisal?

22. These are as follows:

- Early in the process of appraisal of all important transport projects and policy initiatives, a new formal procedure is required to identify the causes of market failure and consider the rationale for intervention.
- An economic impact assessment is required (the detail depending on an initial consideration) to

include both additional effects due to any differences of prices from marginal social costs and incidence effects (spatial, sectoral and social) on economic activity.

- Conventional social cost benefit procedures should be improved to include the short, medium and long term effects of projects and policy intervention on vehicle ownership, frequency and structure of travel, and land use, for passenger and freight travel.
- There should be a standard 'economic impact report' to bring these elements together.

Summary of the Government's Response

23. SACTRA has put forward an extensive list of recommendations to improve transport appraisal methods. The main points in the Government's response are:

- The recommendations on further research and updating are largely accepted and acknowledged as worthwhile undertakings to effect improvements. Results from some of the research recommended will take several years to deliver.
- The Department will provide advice on the requirement for promoters of transport schemes to draw up an economic impact report, as recommended by SACTRA. This will complement the analysis of the other impacts of transport projects and policies, as set out in the NATA. This guidance will be closely linked to the objectives of regeneration policy and focus on the effects of investment in transport infrastructure on the functioning of the local labour market to assist with local job creation. In the longer term the economic impact report may be developed to measure the consequences of transport schemes for the economic performance of the firms and industries served by the scheme.
- The current transport appraisal methods are based on an assumption that markets are competitive or sufficiently close to being competitive. The theoretical analysis of best practice appraisal methods under conditions of imperfect competition is comprehensively analysed in the SACTRA report using both a partial and a general equilibrium approach. The government agrees with SACTRA's conclusion that conventional cost benefit analysis techniques should be modified if the market for transport services or for transport using firms is not perfectly competitive. In the absence of a general equilibrium model this modification will have to be based on the partial equilibrium framework set out by SACTRA.
- The SACTRA report proposes that the implications of imperfect competition for conventional cost benefit analysis should be taken into account through a general equilibrium model (specifically in recommendations 11.04, 11.05 and 11.40). The Government is concerned that the collection of the data needed by such models would represent a substantial and new undertaking. Moreover, while such models are theoretically sound, there is little experience of using them to help in the resolution of practical problems. It is doubtful whether such a complex modelling framework can provide robust outputs, which would be adequate for practical use. The cost of developing and maintaining a sufficiently rigorous model would be considerable and hard to justify for purely transport reasons. For these reasons, the Government will not give priority to developing a computable general equilibrium model.

The Government's Response to SACTRA's recommendations

An Overview

24. The SACTRA report contains a wide range of recommendations. Many of these recommendations are based on detailed research findings including supporting research evidence provided to SACTRA (Barrett 1999; Dodgson 1999; Myles 1999; Simmonds 1999a; Venables & Gasiorek 1999). The report supports the underlying cost benefit approach used in the current appraisal methods but indicates that there is scope for a range of improvements.

25. The SACTRA report is based on sound theoretical foundations. The report builds on these foundations and identifies various specific tasks to improve the appraisal of the economic impacts of transport schemes and policies. Many of these tasks require further work or research to enable appraisal methods to be revised. The implementation of these recommendations requires a programme of work over time. SACTRA accept that the Department should continue with the current methods, updating them as appropriate whenever the results of this programme of research allow the recommendations to be built into revised guidance.

26. The SACTRA report does not indicate the priorities for further work in terms of cost, feasibility or importance nor does it indicate whether following up the recommendations needs to follow any particular sequence. In this context there are several questions to consider. First, is the recommendation acceptable in principle? Second, is it feasible to implement the recommendation? Third, would any of the proposals offer a good expectation, and at a reasonable cost, of significantly improving current appraisal methods? Fourth, is it likely that such changes would influence decisions on priorities? Finally, would we expect implementation of the recommendation including any necessary research to be a short, medium or long-term task? The recommendations were considered in the context of these questions.

27. The Government Response groups recommendations under common themes. The SACTRA recommendations are considered in the next section under each of these themes. Recommendation numbering (from chapter 11) and paragraph numbers in brackets refer to the SACTRA report (SACTRA, 1999).

Main Issues

(I) The structure of the appraisal process

SACTRA recommendations

11.11 We recommend that methods used for forecasting traffic and appraisal of policy interventions should continue to be constructed around the concept of generalised cost, aiming at consistent treatment of both price and travel time effects, direct and indirect, in the short and long run. (Paragraph 6.43)

11.22 We recommend that the appraisal process be structured so as to include the following questions:

1. What is the rationale for the intervention?

2a. What are the benefits/disbenefits of the intervention calculated using conventional transport cost/benefit analysis (using best practice and on the assumption of a perfectly competitive economy outside the transport sector)?

2b. What are the total economic impacts of the intervention?

3. What is the pattern of gains and losses, in both economic activity and jobs, which will arise from the intervention? (Paragraphs 8.22 and 10.225)

11.35 We endorse the following aspects of the Department's policy towards the valuation of travel time savings:

- **the principle of valuing both time savings in case of employers business (working time savings) and commuting and leisure time (non-working time savings) in monetary terms;**
- **the valuation of working time savings according to the wage rate of the relevant class of labour plus labour-related overheads;**
- **ensuring that any standard or average value of non-working time savings which is used is based securely on evidence from a range of empirical studies; and**
- **valuing all time savings and losses, large or small, at the same unit value. (Paragraph 10.72)**

Response

28. Recommendations 11.11 and 11.35 endorse current methods. The overall structure of the appraisal process proposed in recommendation 11.22 is also consistent with the current approach. It takes current methods forward by asking for information on: (i) the total impacts of intervention which would require taking account of levels of competition in the main transport using markets; and (ii) the distributional consequences of interventions.

29. The measurement of total economic impacts is desirable and will be pursued where possible. However, in the current state of knowledge, it is not accepted that this should be a requirement of transport appraisal if it is taken to mean that it must be based on a fully-fledged model of imperfect competition. The measurement of economic impacts is discussed in more detail under the economic impact and computable general equilibrium models. The distributional requirement is discussed in more detail below as part of the economic impact report in (ii) below.

30. The SACTRA report also provides many recommendations which, starting from the existing approach, indicate how improvements might be made rather than developing an entirely new approach. Many of these recommendations require further research, some of which is already in hand, before they can be implemented.

(II) An economic impact report

SACTRA recommendations

11.24 We recommend that the Department prepares and issues advice on the kinds of arguments, which should be considered in developing the rationale for a transport intervention, along with advice on the ways in which the rationale should be articulated. (Paragraph 10.24)

11.45 In spite of the arguments put to us by economic development consultants that standard procedures are not applicable, given the widely varying circumstances in which appraisals have to be undertaken and the variability of the data available, we believe that some standard procedures would make appraisals easier to understand and compare. We recommend, therefore, that the Department undertakes research to develop codified guidance as to how the appraisal of the benefits/disbenefits additional to the transport benefits/disbenefits should be assessed. We have in mind here a guidance note, which parallels, and is broadly as prescriptive as, those which the Department has developed for cost benefit analysis and environmental appraisal. (Paragraph 10.188)

11.46 In order to improve the status quo and meet Appraisal Requirement 3 more satisfactorily, we recommend that there should be:

- **a consideration of the economic and market conditions in the relevant areas and the mechanisms likely to be activated by the scheme;**
- **an assessment of the size of the expected impact on economic activity and jobs in the target area, and of the balance of take-up between existing residents and inward migration; and**
- **an assessment of the extent of displacement both within the target area and between the target and other areas. (Paragraph 10.194)**

11.47 We recommend that, as a matter of standard appraisal practice, specific attention be paid to the effects of an intervention on activities pre-existing in the area targeted for regeneration. (Paragraph 10.200)

11.48 We recommend that the Department investigates further ways in which changes in the pattern of economic activity can be assessed without recourse to a formal model, and issues advice on the analysis of changes in the distribution of economic activity and jobs. (Paragraph 10.206)

11.49 We recommend that the Department considers the methods available for investigating the effects on economic activity of all types of transport interventions (including infrastructure schemes, traffic reduction measures and improvements to public transport) and, if considered practical and affordable, conducts some case studies to enable the development of a better understanding of all the economic development impacts of transport interventions. (Paragraph 10.218)

11.51 We recommend that an Economic Impact Report be produced for all schemes, to go alongside the traffic and environmental appraisals currently undertaken. This report should include all the considerations under Appraisal Requirements 1, 2b and 3 which are relevant to the appraisal of the total economic impacts of an intervention and their distribution. The Department should issue advice on the content of the Economic Impact Report at the same time as advice to adopt the new Appraisal Requirements. Clearly, the content of the Economic Impact Report may need to evolve as new methods are developed, along the lines of our other recommendations. (Paragraph 10.225)

Response

31. SACTRA recommend that the appraisal process should include an account of the economic impacts of intervention and that an 'economic impact report' be produced for all schemes. The recommendation to introduce into the appraisal process an economic impact report is desirable to assist decision makers but the content of such a report will need to be considered in more detail by the Department. SACTRA identify some of the factors which in principle might be included in such guidance.

32. The Department is developing advice on the economic impact report and will issue guidance. The content of this report would need to be based on the recommendations 11.24, 11.45, 11.46, 11.47, 11.48, 11.49 and 11.51. This advice will focus on labour market failures rather than other market failures such as in financial markets. Labour market failures are usually the main reason for intervention and are, we believe, more likely to be addressed by transport measures.

33. The guidance on an economic impact report would not be in place of any existing guidance on environmental costs although it will replace the existing guidance on regeneration within the NATA which at present provides information about the potential of transport intervention measures to promote economic development. The need to improve guidance will give due weight to the extent to which further revisions to the appraisal methods are possible without producing excessively complicated guidance.

34. The arguments about measuring the full economic impact of transport measures (notably in recommendations 11.45 - 11.49) are set out by SACTRA. In the long term these issues may be examined by research. The Department will consider whether further research is required and, as appropriate, issue further guidance to promote more uniform practice (recommendation 11.45).

35. The Department has decided that, in the first instance, the economic impact report will focus on the labour market and the local job creation aspects of transport schemes. In the absence of more sophisticated modelling techniques to capture full general equilibrium effects it is not feasible to recommend a full analysis to include an estimate of all the costs and benefits as suggested in appraisal requirement 2b (see recommendation 11.22) and recommendation 11.51.

36. The economic impact report will measure the distribution effects of transport measures and their total economic impact in any area and, where appropriate, the national effects. Many similar issues arise for regeneration and any guidance on the economic impact report would be expected to cover the effects of transport on regeneration. The economic impact report is intended to meet many of the concerns about taking better account of the regeneration impacts of transport measures such as recommendations 11.24, 11.44 and 11.47.

37. In terms of meeting appraisal requirement 3 (see recommendation 11.22) it will be necessary to include the considerations which SACTRA identify in recommendation 11.46 although an assessment of displacement effects within and outside target areas is a demanding task. A more feasible aim is to identify the mechanisms which are likely to be activated by the scheme and the effects on jobs, taking account of the balance of the take up of jobs from existing residents compared with inward migration.

38. The Department agrees that it would be desirable to have more precise information about the effects of transport interventions on economic activity and (recommendation 11.49) that methods for investigating this should be considered. The arguments for improving guidance on appraisal to take account of wider economic impacts are consistent with the approach taken in NATA and multi-modal appraisal. However,

evaluation exercises will need to be carefully constructed if they are to be useful and cost effective. If transport measures are part of a wider regeneration package of measures then it will often be difficult to disentangle the transport effects from the effects of other measures.

(III) Regeneration issues

SACTRA recommendations

11.23 We recommend that the Department considers whether it is satisfied that the basis for designating areas for economic regeneration is sufficiently rational and that politicians, in making their judgements, are appropriately informed. (Paragraph 8.72)

11.43 We recommend that the Department commissions research into the effects of transport interventions on the tourism sector, in particular because of the importance placed on improving transport for tourism by many regions. These should, however, be placed in the context of the overall structure of any local economy as transport improvements which benefit tourism may be at the cost of negative impacts on other sectors. (Paragraph 10.169)

11.44 We recommend that the Department seeks clarification from the Treasury on the valuation of employment gains in areas where regeneration is a key policy objective. (Paragraph 10.182)

Response

39. The regeneration of an area is frequently linked with the need for transport improvements in addition to other policy measures. SACTRA recommend that appraisal methods should be revised to address the relationship between regeneration and transport measures. However, the measurement of the regeneration effects of transport measures will be at best approximate and partial. The understanding of how transport schemes influence the regeneration of an area is limited while the regeneration benefits of non-transport schemes is currently evaluated through cost-effectiveness analysis.

40. It is expected that Regional Development Agencies (RDAs) will play an important role in the co-ordination of transport and regeneration issues. RDAs are economic development bodies with a keen interest in transport issues and they will provide an important input into developing regional strategies. Regional planning guidance will need to consider the transport implications of the RDAs' proposals in their strategy. Similarly, the regional transport strategy will inform and assist the RDA in the development of its own strategy.

41. The appraisal of regeneration projects currently adopts a cost-effectiveness approach, considering projects in terms of the net cost per unit of output obtained. The diversity of outputs obtained from regeneration projects and the difficulties involved in quantifying and/or monetising many of these outputs prevents a comprehensive and reliable measurement in social benefit terms. Instead, projects are appraised against net cost per output benchmarks, with the evaluation of actual outputs obtained used to feedback into the appropriate benchmarks for future appraisal. However, transport infrastructure measures typically rely more heavily on ex-ante appraisal because they cannot be easily undone. The Department will endeavour to link best practice on the evaluation side of regeneration expenditure with best practice on the transport appraisal methods.

42. The SACTRA case for a review of the basis for selecting designated areas (recommendation 11.23) is not accepted. The selection of deprived areas in need of regeneration funding is based on a detailed assessment of social and economic conditions at the local level. This is taken forward in the preparation of an index of local deprivation that ranks wards across the country in terms of a range of economic and social indicators including income, benefits, housing standards, crime levels and access to services. The Department is reviewing this index and expects to have a new index ready this year.

43. Recommendation 11.43 raises an increasingly important issue for some regions and it is potentially very important for some areas even where current tourism activity may be low. Some aspects of tourism will be covered by other work such as the economic impact report. The types and reasons for tourism will vary by locality and given the complexities of predicting the flows involved the Department does not expect to commission a separate study of tourism purely to address transport appraisal issues.

44. The employment gains in areas where regeneration is a key objective (recommendation 11.44) will be included in the scope of the economic impact report although this might not require the valuation of employment gains. The identification of supply side gains in employment will be referred to the current review of the Treasury Green Book on appraisal methodology.

(IV) Traffic reduction and capacity measures

SACTRA recommendations

11.17 We recommend that all interventions intended to reduce traffic are subjected to cost benefit analysis. (Paragraph 7.33)

11.18 We recommend that, where road traffic reduction targets are used, they should be reviewed regularly, subjected to CBA and pursued through the use of instruments which can be adapted according to circumstances. (Paragraph 7.118)

11.19 We recommend the use of appraisal to identify winners and losers for schemes, whether to reduce traffic or to increase capacity, and that the Department takes appropriate steps to promote this. (Paragraph 7.121)

11.20 We recommend that appraisal should assess the impacts of recycling revenues raised by traffic reduction measures. (Paragraph 7.124)

11.21 We recommend that the Department consider identifying opportunities for monitoring the impacts of a large-scale traffic reduction measure which is due to be implemented in a relatively short period of time, and that it commissions research accordingly. (Paragraph 7.136)

11.32 We recommend that, in considering any traffic reduction measure, the benefits and disbenefits are carefully identified, quantified and weighed to determine both the overall benefits and disbenefits as well as their distribution. Special attention should be given to identifying the areas whose economies may suffer as a result of the traffic reduction measure and to means of redressing the effects by recycling revenues in a targeted fashion. (Paragraph 10.59)

11.33 We recommend that the Department reviews past practice in the appraisal of traffic reduction measures and issues advice on best practice for their modelling. (Paragraph 10.65)

Response

45. Recommendations 11.17, 11.18, 11.19, 11.20 and 11.32 propose that measures which aim to reduce traffic should be subject to a similar method of appraisal as the methods which are applied to traffic infrastructure. This wider application of appraisal methods than in the past is already in operation, it being consistent with the NATA and the Government policy on an integrated transport system. Appraisal of all projects against the Government's five criteria is undertaken whenever appropriate, commensurate with the scale of the measure concerned. Advice on the application of the NATA methodology specifically to smaller projects (PAR -Project Appraisal Report and associated guidance notes) has recently been issued by the Highways Agency. This is for the appraisal of all projects not in the Targeted Programme of Improvements (TPI), for example, the installation of motorway incidence, detection and signalling (MIDAS). We will establish the need for further guidance especially for local authorities on matters such as sources of robust data on local labour markets and measures of local demand.

46. The NATA requires the appraisal of winners and losers which is emphasised in GOMMMS and in the 1999 Guidance on Provisional Local Transport Plans. The latter explains how the capacity reallocation scheme design needs to consider the effective operation of the wider network, interaction with other measures and the balance between gainers and losers.

47. The Department will issue comprehensive guidance on the principles to be followed for the design of urban area congestion charging schemes; these will specify the appraisal principles required for scheme approval and the methods to be adopted. Evaluation of the effects of these schemes will be undertaken before and during their operation and consideration given to how the outcomes compare with the expectations based on the appraisal results. A scoping contract has been let to review how this monitoring might be carried out. This overall process will provide case study data on the robustness of the appraisal methods and inform future appraisals.

48. Recommendations 11.21 and 11.33 are concerned with long term developments. It will be necessary to locate suitable projects to monitor the impact of traffic constraints, initiate research to evaluate such projects and to feed the results of this work into improvements into appraisal guidance. The Department will undertake analysis of the effects of traffic reduction measures on the growth of traffic using the national road traffic forecasting model.

(V) Updating of inputs into the appraisal, evaluation and forecasting methods

SACTRA recommendations

11.10 We recommend that the DETR reviews the consistency of its price elasticities used in different forecasting and appraisal exercises, particularly (though not only) in relation to longer term behavioural responses including car ownership effects, and especially their consistency with the large body of non-DETR literature. (Paragraph 6.38)

11.12 At the same time, we also recommend that consideration be given to incorporating (or making separate direct allowance for) interaction and quality effects which are not so easily handled in a generalised cost framework. (Paragraph 6.44)

11.13 We recommend that explicit separation of income, price and associated effects should be a high priority for the Department's forecasting and appraisal methodology, especially in effects on the bigger behavioural decisions which may take some time to be fully reflected in traffic levels. (Paragraph 6.47)

11.27 We recommend that the Department reviews the evidence in the literature about elasticities of demand, and issues advice designed to ensure that the modelling practices adopted by practitioners properly reflect reality. (Paragraph 10.40)

11.28 We recommend that the Department reviews the recent evidence on less conventional or well-established traveller responses, initiates research to identify their importance and to develop ways in which they may be included in transport models. (Paragraph 10.42)

11.34 We recommend that the Department reviews and updates as necessary the vehicle operating costs used for appraisal purposes. (Paragraph 10.69)

11.36 We recommend that the Department audit and update its current practice in relation to the values of time used in appraisal, including the following issues:

- **the values of employers business time savings, including wage-related overheads;**
- **the value of time savings for the freight carried by goods vehicles (as opposed to the value of the time savings of vehicles and driver) - this could usefully be addressed within the Department's programme of logistics research;**
- **the acceptability of continuing to use a standard value of non-work time savings for all locations and modes within the context of the NATA;**
- **if accepted, the appropriate up-to-date standard appraisal value of non-working time savings;**
- **the boundaries between work and non-work time, and the practice of attaching the same unit value to all non-work savings regardless of journey purpose;**
- **the significance to the economy of journeys currently classified as 'leisure' (such as those involved with caring for relatives); and**
- **the assumed elasticity of the value of time with respect to income. (Paragraph 10.79)**

11.39 We recommend that the Department issues advice on the correct estimation of transport benefits/disbenefits under conditions of substantially changed demand. (Paragraph 10.88)

11.50 We recommend that the Department undertakes research to establish the scale, scope and implications of the 'equilibrium versus dynamics' discussion, and assess what improvements may be feasible. (Paragraph 10.221)

Response

49. The Department requires the use of relevant and up to date inputs in appraisal, evaluation and forecasting methods. This includes the value of time measures, vehicle operating costs and other measures. The Department has in hand an extensive programme of research and analysis.

50. Recommendation 11.36 identifies the need to update values of time used in transport appraisal. The value of time is an important element of the costs and benefits of most transport schemes. The Department has recently commissioned research on the value of time and this report has now been published (Accent Marketing & Research and Hague Consulting Group, 1999). There is a general need to use up to date values but this research has raised several issues about the values in current usage. The Department did not implement any of these findings because SACTRA was considering the issue as part of its remit. The conclusions of SACTRA need to be considered along with the value of time research and judgements made about any differences.

51. The Department has reviewed the findings on the value of time and is commissioning the necessary research. The research will consider the feasibility of the improvements which SACTRA identify as desirable for the value of time and enable a better understanding of the need to review other assumptions. In the light of this work it is intended to provide updated guidance on the value of time inputs used in transport appraisal.

52. SACTRA list several other inputs to transport appraisal, which may need to be reviewed and updated. Recommendations 11.10, 11.12, 11.13 and 11.27 refer to various elasticities which are used for forecasting and appraisal methods including forecasts of car ownership. It is proposed that they should be reviewed with note taken of any inconsistencies and whether these are justified. It will be necessary to examine the effects of income and whether income and price effects should be explicitly separated. These as well as other key inputs will be reviewed where appropriate as part of ongoing reviews and involving new work as required. Recommendation 11.34 for a review of vehicle operating costs is accepted.

53. The Department has an ongoing programme of research to develop methods for modelling how travellers choose when to travel and how these decisions are related to the duration of the peak period. The Department is also conducting and planning further research into a broad range of behavioural factors influencing individual travel decisions. Recommendation 11.28 will need to be taken into account in subsequent work on other less well established traveller responses and integrated where appropriate with consideration of the ’dynamics’ of general traveller responses.

54. Recommendation 11.50, concerning the implications of the ’dynamics’ of general traveller responses, is an area for possible long term research. Recommendation 11.50 might be taken up in various other areas of work including freight transport research.

55. Recommendation 11.39 draws attention to the problems arising under conditions of substantially changing demand. This needs to be taken into account in the application of appraisal methods in some areas, especially for traffic reduction measures where conventional methods may be misleading. The Department will monitor the effects of traffic reduction measures and the accuracy of the appraisals undertaken prior to introduction of such schemes [see (iv) above].

(VI) Business and freight traffic

SACTRA recommendations

11.09 We recommend that research into the effect of income growth on freight traffic should include consideration of any potential factors which might increase or reduce the strength of this relationship as it develops, as well as the non-income effects (price, speed, quality, etc). (Paragraph 6.35)

11.14 We recommend that substantial new research effort is devoted to the development of more robust freight forecasting models which take account of the factors identified in Chapter 6. (Paragraph 6.55)

11.25 We recommend that the Department clarifies its current Guidance on Induced Traffic especially in respect of the elasticities to be applied to business and goods vehicle trips. (Paragraph 10.35)

11.26 We recommend that the Department undertakes research to ensure that business trips are modelled appropriately and specifically to develop better ways of modelling non-home-based trips, especially the business element. (Paragraph 10.38)

11.29 We recommend that the Department conducts a thorough review of past work in modelling of freight responses to changes in the transport system and initiates research to develop sound techniques for modelling goods vehicle responses. (Paragraph 10.47)

11.30 We recommend that the Department initiates research to develop better procedures for forecasting the growth in demand for goods vehicle movements. (Paragraph 10.51)

Response

56. SACTRA identify the need to improve the modelling and appraisal of business and freight travel. The recommendations cover a wide range of issues about freight transport and improved modelling for project appraisal. Any research undertaken will have to be within a wider framework encompassing other types of traffic. The Department will commission research in response to recommendations 11.09, 11.14, 11.26, 11.29 and 11.30.

57. However, work in this area is not straightforward and the details of the research required will need to be carefully considered. It is proposed that the next step forward should be a research project to review existing methods and past and ongoing research in the field (meeting recommendation 11.29) in order to evaluate the feasibility of work on freight and business travel as identified by SACTRA. Further research may be undertaken in the light of the findings from this preliminary study.

58. To address recommendation 11.25 the Department has commissioned work to clarify these aspects and expects to issue revisions to the Guidance on Induced Traffic (DMRB 12.2.2) when it is next appropriate to take into account research findings and other work.

59. To correctly model non-home-based (NHB) trips (recommendation 11.26) one would need to model complete chain trips but this requires a considerable increase in model complexity. The current work on multi-modal trip-ends follows the advice in SACTRA relating the number of NHB trips produced in each zone to the number of home based (HB) attractions and relating the mode of NHB trip to the preceding HB trip in a sensible manner.

60. In modelling mode choice and distribution within the standard trip based approach, we agree that the practice of not allowing demand responses by NHB trips could bias the result towards under-estimating the impact of changes in costs on travel behaviour, depending on the method used to calibrate the model sensitivity parameters. In modelling mode choice the Department will carry out research, reviewing techniques currently available and assessing their suitability for practical application in modelling in the UK.

(VII) The prices and marginal social costs of journeys

SACTRA recommendation

11.16 We recommend that the Department takes steps towards providing official estimates of the relationship between the prices and marginal social costs of different classes of journey by road transport. (Paragraph 7.21)

Response

61. The marginal social costs of different types of journey are important for road pricing and appraisal. This is an important issue and is an area where further medium term research will be necessary to provide any useful information. The Department has this research in hand and is about to commission research, which will cover other forms of surface transport as well as roads. Research will be undertaken to estimate marginal social costs of different classes of journey by road and other forms of surface transport.

(VIII) Reliability

SACTRA recommendations

11.31 We recognise that the estimation of changes in reliability is a very difficult area, but we recommend that the Department takes a wider view of reliability and invests resources to develop appropriate techniques. (Paragraph 10.56)

11.37 We recommend that the Department revisits the work on the valuation aspects of reliability undertaken in the part by Bates, Pells and others in the 1980s and issues advice on the valuation of reliability. (Paragraph 10.82)

11.38 We agree with the Department that the potential magnitude of the reliability benefits warrants further work, both on methods of predicting changes in variability for different types of policy interventions, and on valuing the resulting benefits, and we recommend that the Department gives this area some priority. (Paragraph 10.86)

Response

62. Travel time variability is an important issue for transport appraisal and modelling. A methodology to capture the effects of transport measures on the reliability of journeys and the valuation of these changes is being developed.

63. The Department, with the Highways Agency, has recently initiated testing of interim advice (DETR, 1999) based on the early research results and has established a framework for further work to examine a range of other issues. This work has so far focused on unanticipated delays to journeys but in the longer term it is intended to consider other reliability issues.

64. The Department has undertaken a preliminary analysis of the treatment of travel time reliability within transport appraisal methods and this has provided an improvement in understanding the problem and identifying necessary research. This work will address recommendations 11.31, 11.37 and 11.38.

(IX) Computable General Equilibrium (CGE) and input-output models

SACTRA recommendations

11.04 We recommend that the Department undertakes further development of CGE modelling of the total economic impacts of transport schemes with particular emphasis on incorporating endogenous growth, alternative assumptions as to the behaviour of the labour market and better representations of the transport system. (Paragraph 4.58)

11.05 We recommend that the Department investigates the use of CGE modelling in conjunction with a transport model, to explore the size of the discrepancies between total economic impacts and transport impacts in the cells of table 4.2. (Paragraph 4.76)

11.40 We recommend that the Department considers setting up a computable general equilibrium (CGE) model of the type developed by Venables and Gasiorek for Scotland and using it in tandem with an extended Central Scotland Transport Model with the aim of further understanding what the CGE approach has to offer for appraisal in a real life context in the UK. This will obviously require the co-operation and support of the Scottish Office. (Paragraph 10.137)

Response

65. The general equilibrium approach to transport appraisal is intended to identify the effects of a transport change taking account of effects of imperfect competition (in product, labour and transport markets) and economies of scale. With a change in transport costs, firms will adjust output and the margin between price and marginal cost will change. A general equilibrium approach takes account of the welfare implications of these changes including the adjustments of outputs by firms.

66. The general equilibrium approach to transport appraisal is based on sound theoretical foundations but there are a number of practical and statistical difficulties, which preclude taking this forward at the present time. The extensive analytical and data requirements of a general equilibrium approach are difficult to justify in terms of cost-effectiveness unless the model has wider applications for policy purposes beyond transport issues. A general equilibrium approach would require extensive new data about industry

(industry characteristics, industry flow data and trade and transport data), government and households.

67. In addition to these problems there are also some serious analytical difficulties to overcome. These include: problems about whether the labour market is a competitive market or what forms of imperfect competition operate; the factors which influence migration; the strategic behaviour of firms including the location of firms; the degree of industrial disaggregation; starting points for initial endowments; elasticities of demand; making assumptions about the degree of imperfect competition including barriers to entry; the specification of functional forms where theory cannot be definitive; rules about how to solve a model of this kind including where to set the boundaries of any necessary identities (for example to exclude effects on foreign trade); and the lack of any basis for statistical diagnostics to validate the whole model.

68. The CGE approach would need to surmount all of these difficulties. It is hard to justify pursuing this approach purely from a transport perspective given the scale of the work which will be required. We are not aware that any other country uses such an approach and therefore there would be no comparable work to draw on. Recommendation 11.40 is open to different interpretations. We take it to mean that a CGE approach could be developed on the back of the Central Scotland Transport model. This is not accepted because many of the general objections to building a CGE model will still apply.

69. In the face of these problems, the further research identified in recommendations 11.04, 11.05 and 11.40 on a CGE model will not be commissioned.

70. The difficulties of CGE modelling can be compared with the other SACTRA recommendations which offer more opportunities to improve appraisal methods. The SACTRA report identifies several areas where it appears that further work is needed and where it appears that improvements to the appraisal methods are both feasible and are more likely to be cost effective than the development of general equilibrium modelling. In the absence of a CGE model the implications of imperfect competition may still be considered using a partial equilibrium approach following the analysis provided by SACTRA.

(X) Land Use Transportation Interaction (LUTI) modelling and land use

SACTRA recommendations

11.06 We recommend that further work be devoted to research on the use of input-output models in helping determine and measure the key linkages through which transport affects regional economies. (Paragraph 5.106)

11.07 There is a need for more consistent research evidence on the use of transport and transport costs by sector to inform appraisal practice. We recommend detailed discussion with ONS to define improvements in data collection which will, in particular, allow for better assessment of the role of employers' business travel. (Paragraph 5.130)

11.08 The relationship between wages and employment (the wage equation) in local labour markets, how this is affected by the costs of transport (both into and out of a region and within it) is a major question for further research. We recommend a detailed study of the commuting response to a substantial change in transport provision, which examines not just changes in commuting patterns, but also the impact on wages and employment levels in adjacent areas. (Paragraph 5.131)

11.15 We recommend that the Department review existing research on the mechanisms, scale and time-horizon of the second round effects (on, for example, land use) and on this basis consider the feasibility of further research aimed at quantified usable results. (Paragraph 6.58)

11.41 We recommend that the Department:

- **pulls together its knowledge about land-use/transport interaction models as applied in this country and elsewhere in the world;**
- **considers its stance about the usefulness of land-use/transport interaction models;**

and, on the assumption that the Department will share our views that these models have a role,

- **instigates a programme of research and development designed to improve their treatment of the different markets influenced by transport, including an investigation into methods of extracting measures of total economic benefit;**
- **issues advice on the circumstances in which they should be used and practical guidance on their application to the appraisal of transport proposals; and**
- **considers arrangements for training some of the Department's staff in the theory and use of these models. (Paragraph 10.143)**

11.42 We recommend the Department builds on the research recommendations in Chapter 5 for the further development of LUTI models, to examine in more detail whether it is feasible to derive robust estimates of total economic impacts as well as transport benefits/disbenefits from the same land-use/transport interaction modelling system. (Paragraph 10.146)

Response

71. The work on LUTI models is better developed than CGE models and further research in these areas drawing on existing projects will be reviewed for the medium and long term. Research on LUTI models should take note of the SACTRA work on CGE modelling and be aware of the limitations of currently available LUTI models.

72. The Department welcomes SACTRA's recognition that LUTI modelling at the regional level is not itself the answer to the problem of assessing wider economic impacts at the scheme level. Land use and transport models, based on a real understanding of peoples' behaviour in terms of choices and decisions on location of activities and travel, have a role in integrating land use planning and transport policies.

73. Recommendations 11.06, 11.07, 11.08, 11.41 and 11.42 may be useful even in the absence of a fully developed CGE approach. Further research will be undertaken to develop LUTI models or to approach some of the key linkages between transport and the economy in a more 'piecemeal' way to improve more informal measurement of the economic impact of transport measures. This will include the development of existing models. The LASER model will be improved to provide wide applicability to large projects such as regional airport expansions and multi-modal studies.

74. The Department agrees that a better understanding of the behavioural links between transport and land use decisions is desirable to help make land use and transport models more robust. This will help in validating assumptions used as inputs to policy (see recommendation 11.15). Land use has a key role in delivering an integrated transport strategy, and the Department intends to undertake research to understand

better the mechanisms or linkages between peoples' decisions and choices on travel and location of activity to integrate transport and land use planning policies (see recommendation 11.41). The effects of transport schemes on land use and planning is relevant for other recommendations including regeneration schemes [see (iii) above].

75. Recommendation 11.06 asserts that input-output models should be developed to improve understanding of how transport influences regional economies. The Department agrees that developing detailed input-output models is a considerable task and that such work is likely to require high cost research. However, the Department recognises the importance of input-output models in LUTI models and input-output relationships are used in existing LUTI models such as EUNET. Further planned research on LUTI models will require consideration and possibly further development of input-output models.

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