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MODELLING REQUIREMENTS FOR LOCAL TRANSPORT PLANS IN THE UK

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Abstract

The aim of the paper is to provide a number of recommendations for use of transport and land use planning models in the formulation of local transport plans. It is based on a study of Local Transport Plans (LTPs) in England. LTPs are required by central government (Department for Transport) as part of its process of allocating funds to local authorities. The first round of LTPs (for which 85 authorities submitted plans) was carried out in 1999-2000 and the next round will be required in 2005. Authorities are also required to produce Annual Progress Reports (APRs) summarising the progress made towards meeting the objectives laid out in the LTP. The research was carried out in two stages, the first being a review of current guidance, publicly available Local Transport Plans and other relevant material, the second being a series of case study interviews with five local authorities. From these two processes a number of recommendations on modelling requirements and use of models were put forward classified by the size of the local authority.

Keywords: Local Transport Planning, Modelling, Appraisal
Topic Area: C1 Integrated Planning of Transport Systems

1. Introduction

This paper summarises the findings and suggested recommendations arising from a project undertaken by the Institute for Transport Studies for the UK Department for Transport (DfT) looking at how models are currently used and how they could be used in the future to support the Local Transport Planning process.

The project arose from a series of discussions with DfT concerning the EU Fifth Framework project, PROSPECTS, (2003) (partly sponsored by DfT). PROSPECTS (Procedures for Recommending Optimal Sustainable Planning of European City Transport Systems) developed guidance for cities throughout Europe on good practice in the preparation of sustainable transport and land use strategies. It produced three guidebooks: one for decision-makers (May et al, 2002) covering the overall process of strategy formulation; one for professionals (Minken et al, 2003) on the methods available; and one for policy makers on the policy instruments available, and experience with their use. The last of these was incorporated into the KonSULT database (KonSULT, 2003).

The Department already has an established set of procedures for dealing with many of the above issues through the Local Transport Plan process. The guidance includes the initial guide on preparing Local Transport Plans (LTPs), the subsequent guidance on Annual Progress Reports, and the Best Practice Guides for both. While these guides provide extensive advice on objective setting and strategy formulation, they provide less information on the analytical approaches which might be used in forecasting the impacts of alternative strategies and appraising their potential performance. Moreover it appeared that relatively few local authorities had used formal forecasting and appraisal tools in the preparation of their first round LTPs, raising questions about the robustness of their appraisal. It is currently anticipated that the next round of LTPs will be required in 2005,

and that guidance for them should be available by mid 2004. The Department is considering the advice which might be given on forecasting and appraisal techniques in this second round of guidance.

The question posed, which this project was designed to address, was how the results from PROSPECTS could best be used to provide input, to the next round of guidance, on the use of forecasting and appraisal techniques for LTP preparation. The project consisted of four tasks, the first task being a desk-top review of the modelling, forecasting and appraisal tools available for the production of Local Transport Plans. The review aimed to:

- identify the theoretical and practical strengths and weaknesses of alternative methodologies;
- identify the circumstances in which they are recommended for use and where they are actually used; and
- in view of the relatively limited use of formal forecasting techniques in practice, suggest ways in which methodologies can be enhanced to overcome barriers to use.

The second task carried out five case study interviews with a range of local authorities. The purpose of the interviews was to :

- identify current requirements and use of models and analytical tools in preparation of the LTP[1];
- identify areas in which they might benefit from enhancements to such tools and the benefits which they might gain; and
- seek views on our initial conclusions from the initial review and hence refine our recommendations on the need for, and potential benefits of the use and enhancement of analytical tools.

The third task, not reported here, was to provide a review of current modelling approaches. The fourth task was a "Final Workshop" which involved representatives of the LTP authorities and which discussed the results of the previous three tasks.

The method taken in the research involved firstly making a review of previous use of models in LTP formulation for 18 of the 85 LTP authorities, using publicly available LTP and APR documents on the internet. The quality of all LTPs from the 1999-2000 round had been classified by the Department for Transport into one of the following categories: "well above average", "above average", "average", "below average" and "well below average". Emphasis was put on reviewing LTPs from the "well above average" and "above average" LTPs in order to extract aspects of good practice. However, LTPs from the other categories were also reviewed in order to examine whether there was any link between quality and model use.

Given the extremely heterogeneous nature of the geographical areas covered by the different authorities submitting LTPs, these authorities were classified into five "size" categories:

- metropolitan authorities, covering areas with large populations concentrated in closely interlinked cities and towns;
- shire counties, covering large (mainly rural) geographical areas, with only a small number of towns with populations over the size of 20,000
- large monocentric unitary authorities, covering a free-standing city or large town (population greater than 170,000) and its hinterland
- small monocentric unitary authorities, covering a free-standing town (population less than 170,000) and its hinterland

[1] Note that we were not concerned with the modelling of major schemes (greater than £5million) as it was DfT's view that the current guidance was sufficiently well documented and accepted.

- and polycentric authorities, covering areas with small populations concentrated in closely interlinked towns

Based upon this classification, a number of *a priori* suggestions were made for different sizes of authority with respect to the use of one or more types of model, ranging from: sophisticated Land Use Transport Interaction (LUTI) models; simpler LUTI models (otherwise known as Sketch Planning Models); traditional four-stage transport models; network assignment models in conjunction with external demand / mode choice models; network assignment models with and without elastic assignment; and simple "spreadsheet" or "elasticity-based" models.

Five in-depth interviews were then made to test these suggestions with local authority planners from West Yorkshire; Greater Manchester; Buckinghamshire; North East Lincolnshire; and Nottingham. These authorities covered the range of authority types above.. In the interviews, emphasis was put upon the following issues: use of simplified techniques for authorities without a strong tradition of transport modelling; whether a national model would be of any use in helping to support the formulation of LTPs; and how problems associated with the perceived shortage of experienced transport modellers might be overcome. Combined with the a priori suggestions, these interviews led to a number of conclusions (given below) about model use in future LTPs.

The next two sections summarise the main findings and recommendations from the first two tasks. The final section provides the recommendations of the study taking into account the views from the Final Workshop.

2. Review of requirements and evidence of model use

The first stage of the research gave a short review of the requirements for models, firstly from the UK appraisal methodology, NATA (defined below) and secondly from the LTP preparation process.

2.1 Requirements from NATA

With regard to appraisal methodology, the UK Government has sought to develop closer linkages between its transport policy objectives and the assessment of projects (Mackie and Nellthorp, 2001). This led the government to create its New Approach to Appraisal (NATA). One innovation within the New Approach is the summary presentation of the key scheme impacts on a single sheet of A4 (Department of the Environment, Transport and the Regions, 1998). Table 1 shows such an Appraisal Summary Table (AST).

Features include a statement of problems, an outline of other options considered, a list of scheme impacts mapped onto the government's five objectives (environment, safety, economy, accessibility, and integration), and qualitative, quantitative and, where relevant, monetary measures of impacts.

Mackie and Nellthorp (2001) note however that there are many weaknesses with NATA. Insufficient progress has been made with the derivation of money values for noise and pollution. Much more work is required in developing acceptable measurement and valuation of important impacts such as reliability and regeneration. Some elements such as integration seem politically rather than technically inspired, while in other cases, double counting is a risk. Nevertheless, the AST has enhanced the contribution of appraisal to decision-taking in the U.K., and forms the basic reporting structure for the Local Transport Plans.

Table 1: Sample Appraisal Summary Table

Description		**Problems**	**1)Total Costs of the Proposal £M 2) Cost to Government £M**	
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE MEASURE**	**ASSESSMENT**
ENVIRONMENT	Noise			Net properties win/lose with scheme
	Local Air Quality			Net properties win/lose with scheme
	Greenhouse Gases			Tonnes of CO2
	Landscape			Score
	Townscape			Score
	Heritage of Historical Resources			Score
	Biodiversity			Score
	Water Environment			Score
	Physical Fitness			Score
	Journey Ambience			Score
SAFETY	Accidents			PVB £M
	Security			Score
ECONOMY	Transport and Economic Efficiency			Users: NPV £M Private Providers: NPV £M Public Providers: NPV £M Other Government: NPV £M
	Reliability			Score
	Wider Economics Impacts			Score
ACCESSIBILITY	Option Values			Score
	Severance			Score
	Access to the Transport System			Score
INTEGRATION	Transport Interchange			Score
	Land-use Policy			Score
	Other Government Policies			Score

2.2 Requirements in LTP Guidance

Local Transport Plans form part of the system in which local authorities bid for capital resources; the process for producing them was specified in LTP Guidance (LTPG). The plans are built around five year transport strategies and contain many of the elements present in the multi-modal studies: setting objectives, identification of problems, proposal of solutions and costing and evaluating solutions against objectives. With regard to forecasting and appraisal, the guidance for the production of Local Transport Plans is quite general and based around the principles that underpin NATA. The guidance recommends that plans should describe existing transport problems and levels of service and contain a vision for the area that includes a set of quantifiable objectives. Targets and performance indicators should be identified and monitoring arrangements considered as an integral part of LTP development. Appraisal should then be used to determine whether targets are achievable.

With respect to any schemes included in a plan, the type of forecasting and appraisal recommended varies according to the size of the scheme being proposed. Three grades of schemes are defined:

- Small (<£250,000);
- Significant (>£250,000); and

- Major (>£5million).

Small schemes should be described in the plan as part of a package of related measures, significant schemes should identified and described in the plan, and major schemes need appraisal in their own right. Where a package of measures is proposed, the guidance recommends analysis of how the separate measures interrelate and contribute to objectives. A range of solutions should then be tested to establish affordable measures that are most likely to meet objectives. Annual progress reports are required to update actual expenditure and performance against objectives and targets.

In parallel to the LTPG, the Road Traffic Reduction Act (RTRA) requires local traffic authorities to produce a report containing an assessment of existing levels of local road traffic and a forecast of expected growth in those areas. The Government recognises the need for individual authorities to take account of local conditions when fulfilling this requirement but identifies standards in data collection and forecasting that encourage robust analysis.

In summary, the LTP guidance aims to encourage good practice at the Plan level but does not provide detailed advice on forecasting and appraisal. However, such advice does exist for major scheme appraisal. The need to tackle this perceived gap led to the current project.

2.3 Current approaches to modelling

We can define a hierarchy of modelling methodologies that includes:

- No model– purely qualitative ticks in boxes (perhaps relying on expert judgment or previous results)
- Simple cost based – add financial costs to above
- Spreadsheet model
- Sketch planning model
- Network assignment model in isolation without elastic assignment
- Network assignment model in isolation with elastic assignment
- Network assignment model in conjunction with external demand / mode-choice model
- Four stage model
- Land-use Transportation Interaction (LUTI) model
- Strategic Transport/Environment Model

In most circumstances, methodologies further up the hierarchy generate more accurate forecasts and are more expensive to develop. Under these assumptions there is a trade-off between accuracy and cost. High-cost studies are suited to schemes or plans where potential costs and benefits are large and that low-cost studies are suited to smaller schemes or plans. If both types of scheme compete for the same resources, it is important that like is compared with like and that either a common forecasting and appraisal methodology is applied or explicit account is taken of the risks associated with each methodology.

2.4 Evidence from LTPs and annual progress reports

Table 2 provides information about modelling from a number of LTPs (and subsequent Annual Progress Reports). For reasons of resource efficiency, no attempt was made to cover all LTPs. However, sufficient LTPs were reviewed in order to give a flavour of the modelling issues concerned. Information about modelling is given according to five categories of authority, with LTP assessments for 2001:

Well above average - Above average – Average - Below average - Well below average

Table 2 also provides the 'Indicative Total Plan Allocation' for each of the selected authorities (shown in the column headed £M and taken from the DfT document LTP settlement (2001-02) and websites where further information on the LTPs can be found.

Table 2: LTP Reviews

AUTHORITY	Indicative plan allocation £M	Website	Notes
WELL ABOVE AVERAGE[2]			
Buckingham-shire	55	http://www.buckscc.gov.uk/transport_plan/index.stm	No county-wide transport model. Two main urban areas have detailed local transport models.
City of York	28	http://www.york.gov.uk/environment/transport/ltp/	'Over the next 5 years York will continue to undertake extensive research and development work on air quality including real time pollution monitoring and forecasting, integrating the city air quality and traffic models'.
Telford& Wrekin	21	http://www.telford.gov.uk/Environment/Transport/ltp_full.htm	Used SATURN for car only assignment studies. No mode choice taken into account.
West Yorkshire	267	http://www.westyorkshire-ltp.co.uk/	Used Strategic Transport Model (STM) developed by TRL.
ABOVE AVERAGE			
Cheshire	86	http://www.cheshire.gov.uk/ltp/ltp_text.htm	No obvious modelling.
Greater Manchester	341		LTP used the Greater Manchester Strategy Planning Model (SPM). 'The model represents the main interactions between transport demand and land use.
Greater Nottingham	91	http://utc.nottscc.gov.uk/polindex.htm	City council is currently developing a multi-modal transportation model for Nottingham.
Peterborough	17	http://www.peterborough.gov.uk/services/	No Model for the LTP but are using SATURN and spreadsheet based models to study a Bypass scheme.
Swindon	24	http://www.swindon.gov.uk/travelstrategy	LTP unavailable on internet. However, the recently completed Swindon Area Plan (part of South West Area MultiModal Study) used the Swindon SATURN model. It is understood that this model was used in preparation of the LTP.
Warrington	21	http://www.warrington.gov.uk/council/pub_ltp.htm	Two transportation models have been employed to enable analysis of the effects of various land use and transportation policies.
Worcestershire	54	http://www.worcestershire.gov.uk/home/index/cs-index/cs-transport/cs-env-ltp.htm	LTP available on the internet. Makes no reference to modelling.

[2] These are based on 2001 assessments, 2002 and 2003 assessments were different and based on Annual Progress Reports. Note that the 2002 assessments changed the position of several Local Authorities considerably.

A number of general comments can be made about the information in Table 2 :

- There is clearly a wide range of model use between authorities. In general, though, it would seem that the authorities with more successful LTPs used models more than those with the less successful LTPs.
- Models seem to be used particularly for helping to compile the report required by the Road Traffic Reduction Act.
- An important factor concerns whether models were used directly for preparation of LTPs or whether model results were used which had been produced by other studies. The impression from our review is that models and model results were used in both these modes. It is clearly cost-effective if available results from other modelling studies can be used in LTPs, but care needs to be taken that these results are consistent and strictly relevant.
- There is some evidence (from Annual Progress Reports) that authorities with less successful LTPs are making extra effort to improve their planning procedures. This effort can include commissioning the construction of new models, whose results could presumably be used in the next round of LTPs.

AUTHORITY	**Indicative plan allocation £M**	Website	Notes
AVERAGE			
North Lincolnshire	21	http://www.northlincs.gov.uk/LTP/index.htm	LTP available from website. No obvious modelling, though TEMPRO used.
BELOW AVERAGE			
Bath and North East Somerset	23	http://www.bathnes.gov.uk/PublicTransport/localtransportplan/default.htm	Multi-Modal Model for Bath, B&NES also intend to develop a traffic model for the Norton-Radstock area'.
East Riding	36	http://www.eastriding.gov.uk/working/transplan.html	No area wide model but recently developed SATURN and VISSIM microsimulation models to study strategic routing around Beverley.
North Yorkshire	100	http://www.northyorks.gov.uk/ltp/fullplan/default.shtm	LTP available on the internet. Not obvious if any modelling was used.
WELL BELOW AVERAGE			
Bracknell Forest	7	http://www.bracknell-forest.gov.uk/index.htm	LTP available to download. No obvious mention of modelling.
Slough	6	http://www.slough.gov.uk/LocalEnvironment/localtransport.asp	LTP available on the internet. Traffic model not used - existing models out of date.
Wokingham	11	http://www.wokingham.gov.uk/sys_upl/templates/StdRight/StdRight_disp.asp?pgid=3502&tid=71	LTP available on the internet. The Road Traffic Reduction Report states 'In the absence of a reliable transport model for the District, estimates of traffic demand increases could be based on NRTF forecasts or TEMPRO, with adjustments being made to reflect local factors'.

2.5 Modelling requirements

The level of modelling required depends upon three broad factors:

- types/packages of instruments

- stage of development of a package
- size of authority

Types/packages of instruments

For each objective in the Appraisal Summary Table (Table 1), using the KonSULT (2003) categorisation, the range of policy instruments that might be included in an LTP and alternative modelling approaches are shown in Table 3. The table suggests low, mid and high level modelling approaches.

In general an LTP will include packages of instruments. In these packages, some instruments will be straightforward to model and others difficult to model (by currently available models). It follows that the capability of currently available models to represent the effects and responses to packages of instruments will depend very much upon the precise nature of the package, in particular concerning issues such as whether one or more instruments are "dominant" (in terms of its impacts) within the package. These issues will clearly depend upon the level of implementation of any instrument within a package, and will vary on a case-by-case basis. In the light of these comments, Table 3 can only provide a first suggestion of which modelling approach LTP authorities should adopt. A more detailed specification of approach will need to be made on a case-by-case basis by each authority, taking into account the information about effects and responses to instruments.

Stage of development of a package

In general, when recommending an appropriate modelling strategy, attention should be paid to the stage at which it is in the planning process. With respect to the production of LTPs, two types of package can be identified:

1. Packages that are at a relatively advanced stage in the planning process for which modelling has already been carried out (independently of the LTP)
2. Packages that are at a relatively early stage in the planning process, and for which modelling needs to be carried out to produce the LTP.

Size of authority

The first stage of the project concluded by providing an *a priori* specification of the type of modelling approaches (as featured in Table 3) which might be used by different types of authority for LTP preparation. It considered that size is the most important factor for differentiating between authorities. Benefits were assessed according to the five different types of authority. With respect to urban modelling, the needs of small monocentric unitary authorities, polycentric unitary authorities and shire counties were assumed to be similar.

The *a priori* specifications tested via interviews in the second stage of the project were :-

M : Metropolitan

Metropolitan authorities would typically be expected to be using models at the high level of specification, and in particular a land-use transportation interaction model, when producing LTPs. A question arises as to whether there would be an overall benefit from using more spatially detailed models for LTP preparation (such as a network model or a microsimulation model). This question was explored in the interviews.

L : Large Unitary (> 170k)

Large unitary (monocentric) authorities would typically be expected to be using models at the mid to high level of specification, and in particular a four-stage transportation model, when producing LTPs. A question arises as to whether there would be an overall benefit to

using more spatially detailed models for LTP preparation (such as a network model or a microsimulation model). This question was explored in the interviews.

S : Small Unitary (< 170k), P: Polycentric Unitary, C: Shire County

For LTP preparation, small unitary (monocentric) authorities, polycentric unitary authorities and shire counties would typically be expected to be using models at the low to mid level of specification. It might be the case that they already use urban network models or microsimulation models for other purposes. If so, the results from these models could be used in LTP preparation. A question arises as to whether it is necessary to use such models in the LTP preparation process and/or use simple tools such as sketch plan model or spreadsheets. These questions were explored in the interviews.

Table 3: Appraisal, Instruments and Models

OBJECTIVE	**SUB-OBJECTIVE**	**INSTRUMENTS**	**ALTERNATIVE APPROACHES**		
			Low	**Mid**	**High**
ENVIRONMENT	Noise	i,ii,iii,iv,vi	1,3	4,5,6	7,8,9,10
	Local Air Quality	i,ii,iii,iv,vi	1,3	4,5,6,	7,8,9,10
	Greenhouse Gases	i,ii,iii,iv,vi	1,3	4,5,6,	7,8,9,10
	Landscape	i,iii	1	Na	na
	Townscape	i,iii	1	Na	na
	Heritage of Historical Resources	i,iii	1	Na	na
	Biodiversity	i,iii	1	Na	na
	Water Environment	i,iii	1	Na	na
	Physical Fitness	i,ii,iii,iv,v,vi	1	Na	8,9
	Journey Ambience	i,iii	1	Na	na
SAFETY	Accidents	i,ii,iii,iv,v,vi	1	4,5,6	7,8,9,10
	Security	i,ii,iii,iv,v,vi	1	Na	na
ECONOMY	Transport and Economic Efficiency	i,ii,iii,iv,v,vi	2,3	4,5,6	7,8,9,10
	Reliability	i,ii,iii,iv,v,vi	1	5,6	7
	Wider Economic Impacts	i,ii,iii,iv,vi	1	4	9,10
ACCESSIBILITY	Option Values	i,iii,iv	1	Na	na
	Severance	i,iii,iv	1	Na	Na
	Access to the Transport System	i,iii,iv,v,vi	1	Na	8,9
INTEGRATION	Transport Interchange	i,iii,iv	1	Na	8
	Land-use Policy	i,iii	1	Na	9
	Other Government Policies	i,ii,iii,iv,v,vi	1	?	?

Table 3 Key

Instruments:

i. Land-use measures
ii. Attitudinal and behavioural measures
iii. Infrastructure measures
iv. Management measures
v. Information measures
vi. Pricing measures

Available Models

1. No model– purely qualitative ticks in boxes (perhaps relying on expert judgment or previous results)
2. Simple cost based – add financial costs to above point
3. Spreadsheet model
4. Sketch planning model
5. Network assignment model without elastic assignment
6. Network assignment model with elastic assignment
7. Network assignment model in conjunction with external demand / mode choice model
8. 'Traditional four stage' model
9. Land-use transportation interaction model
10. Strategic Transport/Environment Model

3. Case study interviews

Under the second stage we carried out five case studies with a range of local authorities from small unitary to large metropolitan area and with a range of modelling experience. Invitations to participate were sent to 12 local authorities with responsibility for LTPs (four metropolitan authorities, three shire counties, two large monocentric unitary authorities, two polycentric unitary authorities and one small unitary authority). The selection process also considered the LTP score (according to DfT's 2001 assessment) and was intentionally biased towards authorities with a "well above average" or an "above average" score, although other authorities were also approached. We carried out five interviews: with Buckinghamshire, Greater Manchester, Greater Nottingham, North Lincolnshire and West Yorkshire.

3.1 Results and initial recommendations

3.1.1 Metropolitan authorities

From section 2.5 we suggested : Metropolitan authorities would typically be expected to be using models at the high level of specification, and in particular a land-use transportation interaction model, when producing LTPs. A question arises as to whether there would be an overall benefit from using more spatially detailed models for LTP preparation (such as a network model or a microsimulation model).

Both West Yorkshire and Greater Manchester used high level strategic planning tools in preparation of their LTPs; the latter included a land use modelling element whilst the former did not. Both authorities also made use of more detailed model results from other studies. Both authorities saw staffing and resources as a barrier to model use and both authorities would like to see a better link to current research on model use. By combining the experience from West Yorkshire and Greater Manchester with the insights from the first stage of the project, we made a number of recommendations, which are given below.

- a1) Local authorities should use a strategic model to represent the overall effects of different plans for the LTP
- b1) Local authorities should consider strongly the possibility of including a land use modelling element in the strategic model (if this is not already included)
- c1) DfT should consider supporting developments which provide a "benchmark tool" for other authorities in meeting any LTP guidance on modelling such as GMTU's START-DELTA model.
- d1) Local authorities should use the process of running a strategic model to bring cohesion to the different partner authorities involved with creating an LTP for a metropolitan region (encouraging them to think on a non-parochial basis)
- e1) If available, local authorities should use results from city-based network assignment models when used (separately from the LTP) to assess the impact of both major and minor schemes, but do not fund such work from the LTP preparation budget
- f1) DfT should develop advice on how to represent/allow for policy instruments that cannot currently be modelled
- g1) DfT should provide information (data and model output) to the authority based upon any national databases and models which it uses (both network models and non-network policy models)
- h1) DfT should seek advice from the local authority on the accuracy of the data (relevant to the authority) contained in its national databases and models.
- i1) DfT should produce more effective procedures for informing local authorities of state-of-the-art research into impacts of new instruments, e.g. how to model

or value effects of better information, tele-working responses, awareness campaigns, travel plans etc.

j1) DfT should make more funds available for training new modellers and developing the skills of existing modellers

k1) DfT should consider differing levels of modelling requirements according to the state of the scheme.

3.1.2 Large unitary (> 170k)

From section 2.5 we suggested : Large unitary (monocentric) authorities would typically be expected to be using models at the mid to high level of specification, and in particular a four-stage transportation model, when producing LTPs. A question arises as to whether there would be an overall benefit to using more spatially detailed models for LTP preparation (such as a network model or a microsimulation model).

Greater Nottingham have recently developed a multi-modal model combining SATURN assignment with TRIPS public transport and a standard mode choice and demand model. This has the advantage of giving a greater level of detail for corridor or link based instruments than a strategic LUTI model. However the City recognised that ideally land use responses and slow modes should also be included in the model. If resources permitted Nottingham would like to purchase a full LUTI model. There are obviously advantages and disadvantages to using a more strategic approach and we would suggest that for major schemes a broad brush approach may be useful at an early stage of development, but that as the scheme progresses a more detailed approach is justified. Again as for metropolitan areas a combined model with a hierarchical approach may be the ideal solution for Large Unitaries but the current use of available assignment models linked to demand models provides sufficient data to appraise the majority of private car and public transport based schemes. Key recommendations arising for large unitaries are as follows :-

a2) Where assignment models already exist these may be combined to form multi-modal models and provide a reasonable level of detail for appraisal of private car and public transport based schemes

b2) A strategic (broad brush) land use approach including slow mode effects is justified for the major schemes. Here the simple model approaches set out in the Task 3 report may be considered as useful.

c2) A requirement to model smaller schemes would place unrealistic demands upon the local authorities, however it is important to model the combined effect of such schemes.

d2) The modelling and appraisal requirements should be tailored to the stage of the scheme bid – even for major schemes.

e2) DfT should consider a phased approach to modelling to reduce “risk” taken by local authorities. It was suggested that no modelling should be required for a first bid, followed by a broad brush approach for work in progress and if successful more detailed modelling may be required. This fits in with the concept of a hierarchical approach to modelling.

f2) Modelling of new instruments such as workplace parking levies should be tackled with caution and monitoring of any scheme impacts should be fed back into the modelling process.

g2) Results of such modelling experiences should be shared with other authorities.

3.1.3 Small unitary (< 170k), Polycentric Unitary, Shire counties

From Section 2.5 we suggested : For LTP preparation, small unitary (monocentric) authorities, polycentric unitary authorities and shire counties would typically be expected

to be using models at the low to mid level of specification. It might be the case that they already use urban network models or microsimulation models for other purposes. If so, the results from these models could be used in LTP preparation. A question arises as to whether it is necessary to use such models in the LTP preparation process and/or use simple tools such as sketch plan model or spreadsheets.

North Lincolnshire and Buckinghamshire did not use any models for preparation of their LTP. North Lincolnshire have recently decided to commission a SATURN model for Scunthorpe and Buckinghamshire supports CONTRAM models for Aylesbury and High Wycombe. There is in general a problem that most of the traffic within the urban areas of these authorities has origins/destinations outside the urban area, so that stand-alone urban models have limited benefit in preparing long term plans if used in isolation. Whilst in some cases this problem can be resolved by producing a model that includes an urban area and its hinterland, in many/most cases this hinterland involves locations outside the responsibility of the authority; for example, London is part of the hinterland for urban areas in Buckinghamshire. There is also in general a problem of skill shortage for all authorities in this class (even in the role of "intelligent client", i.e. without the need to carry out hands-on modelling), which becomes more accentuated the smaller the authority.

Recommendations for small unitary, polycentric unitary and shire counties are :

a3) Existing model results should be used where possible but DfT should not insist on a high level of modelling where models have not already been developed (unless such development were funded from central funds)

b3) Local authorities and DfT to consider alternative simple models (detailed in the Task 3 report)

c3) Local authorities should use these simple models in conjunction with already-existing network models (e.g. SATURN, CONTRAM or microsimulation) if used by the authority for other purposes

d3) DfT should set up pilot case studies as research projects to test the feasibility of approaches given in (c3); these pilot studies should be located in typical urban areas as opposed to, for example, areas with large numbers of tourists.

e3) DfT should develop advice on how to represent more policy instruments and to allow for instruments that cannot currently be modelled, particularly addressing the needs of small authorities and shire counties with small urban areas

f3) DfT should provide information (data and model output) to local authorities based upon any national databases and models which it uses (both network models and non-network policy models)

g3) DfT should seek advice from the local authorities on the accuracy of the data (relevant to the authority) contained in its national databases and models.

h3) DfT should provide advice to local authorities on how national data and model output (including both information concerned with the area covered by the authority and with areas covered by neighbouring authorities) can be used in conjunction with any modelling carried out by the authority in producing the LTP

i3) DfT should make more funds available for developing the skills of already-existing local authority staff so that the local authorities are better placed to take an "intelligent client" role with respect to modelling.

3.2 General issues

- There are a number of general issues which arose during the interviews which are applicable to all LTPs, as follows:

- There is a general skill shortage in all authorities so DfT needs to help with providing expertise and models, rather than simply financing local authorities to develop more models.
- More research into impacts of new instruments needs to be fed down to local authorities e.g. how to model or value effects of better information, tele-working responses, awareness campaigns, travel plans etc.
- Research is required into how best to integrate the impacts of LTP strategies within a strategic model.
- The modelling requirements should be tailored to the state of the scheme.
- Any models used by local authorities should be approved for use by DfT if bids are in competition for limited funds.

3.3 Comments from the final workshop

The results and initial recommendations above were presented to DfT and Local Authority representatives at the final workshop in October 2003. The following points were taken on board in creating the final recommendations:

1. Although strategic models were seen as a useful approach to modelling major and significant schemes and to some extent the general LTP bid, it was suggested that both Metropolitan Authorities and Large Unitaries would still require the detail afforded by the more traditional network based models at some stage of the appraisal. A hierarchical approach may therefore be adopted whereby strategic analysis is used in the first stage of a bid and more detailed appraisal conducted once the bid has been accepted. This proposal is in line with our suggestions for a phased approach to modelling.
2. There was some concern over the capability of strategic models to model small schemes which in general make up a plan. This problem has been noted in the report above and further research is required. However a strategic model can be used with a broad-brush approach to investigate which policy levers deliver the required objectives.
3. There was concern that the strategic models are only able to model instruments which are not under local authority control and that they look too far into the future rather than the next five years. This view is driven by the need to plan for a five year period in which little change to legislation is considered. However local authorities are being asked to plan for the longer term, including appraisal of longer term impacts; and should therefore be open to using more strategic approaches and to considering options as yet unavailable to them. The earlier suggestion that DfT consider a phased approach to modelling requirements depending on the stage of the scheme could also relate to the envisaged implementation year. For example where a scheme is to be implemented within the five year plan then a more detailed approach to modelling could be a requirement, whereas strategies which are beyond the five year horizon could be modelled in a more strategic manner.
4. In addition, despite the support for a modelling based approach in general, there was also concern from the local authorities about the resources and time required to implement such modelling approaches in time for the next round of LTPs given the timing of any future guidance.

4. Summary and final recommendations

The review of LTP requirements and current practice identified the NATA Appraisal Summary Table as playing a key role in the LTP bid. It appears that DfT place more value on quantitative rather than qualitative information. The review of past experience showed

that there was a wide range of model use between authorities with respect to the preparation of the last round of LTPs. In general, though, it would seem that the authorities with more successful LTPs used models more than those with the less successful LTPs. Models seem to be used particularly for helping to compile the report required by the Road Traffic Reduction Act. Model results came from two different types of source: from models which were commissioned for use specifically for the preparation of the LTP; and model results which had been produced by other studies but which were relevant to the LTP. In general, it is clearly cost-effective if available results from other modelling studies can be used in LTPs, but care needs to be taken that these results are strictly relevant. There is some evidence (from Annual Progress Reports) that authorities with less successful LTPs are making extra effort to improve their planning procedures. This effort can include commissioning the construction of new models, whose results could be used in the next round of LTPs.

However we found from the case study interviews that modelling is considered too expensive and difficult to undertake due to a lack of the necessary skills. Given this we provided some recommendations for model use in LTP preparation which varied most notably by size of local authority. The larger metropolitan authorities should, we suggest, be using the more complex models including a land use element where feasible. Large unitaries should produce a multi-modal model in order to provide a reasonable level of detail for appraisal of private and public transport based schemes. Smaller authorities should where possible make use of already-existing model results, produced for other purposes, and otherwise consider whether a model is required at all.

We also noted that model use and appraisal requirements should depend on the potential impact of the scheme and on the state or stage of development of the scheme. For an initial bid a simple sketch plan approach as described in the review of strategic models should be considered for all authorities.

In light of the discussions at the workshop we have finalised our recommendations as follows (with issues of particular concern to authorities being given in italics):

Metropolitan Areas

- Local authorities should, *where one exists*, use a strategic model to represent the overall effects of different plans for the LTP *for longer term planning using a broad-brush approach.*
- Local authorities should consider strongly the possibility of including a land use modelling element in the strategic model (if this is not already included)
- If available, local authorities should *continue to* use results from city-based network assignment models when used (separately from the LTP) to assess the impact of both major and minor schemes, but do not fund such work from the LTP preparation budget.
- *More detailed appraisal will always be beneficial and should be considered for those elements of the plan which are close to implementation.*

Large Unitaries

- Where assignment models already exist these may be combined to form multi-modal models and provide a reasonable level of detail for appraisal of private car and public transport based schemes – *however this should not be a requirement at this stage.*
- A strategic (broad brush) land use approach including slow mode effects *can be* justified for the major schemes. Here simple model approaches may be considered as useful. *Again any model developments should be considered on a case by case approach and should not be a formal requirement.*

- A requirement to model smaller schemes would place unrealistic demands upon the local authorities, however it *would be beneficial* to model the combined effect of such schemes.
- DfT should consider a phased approach to modelling to reduce "risk" taken by local authorities. It was suggested that no modelling should be required for a first bid, followed by a broad brush approach for work in progress and if successful more detailed modelling may be required. This fits in with the concept of a hierarchical approach to modeling *which was in general supported by the workshop.*

Smaller authorities

- Local authorities and DfT to consider alternative simple models such as TPM, STM and SPM
- Local authorities *may find it beneficial to* use these simple models in conjunction with already-existing network models (e.g. SATURN, CONTRAM or microsimulation) if used by the authority for other purposes
- DfT should set up pilot case studies as research projects to test the feasibility of these approaches; these pilot studies should be located in typical urban areas as opposed to, for example, areas with large numbers of tourists.

General issues

- More emphasis should be placed on monitoring of schemes and results should be shared between authorities and used to improve the coverage and performance of models.
- More research into impacts of new instruments needs to be fed down to local authorities e.g. how to model or value effects of better information, tele-working responses, awareness campaigns, travel plans etc.
- Research is required into how best to integrate the impacts of LTP strategies within a strategic model.
- The modelling requirements should be tailored to the state of the scheme.
- *It is important to acknowledge that local authorities' modelling capabilities will develop over time, and it would thus be wrong to insist on all authorities attaining the same level of modelling expertise by a given date. The Department should encourage the use of appropriate models rather than insist on model use and take into account the time and resource constraints under which local authorities work in preparation of the LTP. However, local authorities need to be aware of the implications of impacts which they are unable to model.*

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