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Implementing Innovatory Transport Measures: What Local Authorities in the UK Say About Their Problems and Requirements

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There is a growing emphasis on the need to secure an integrated transport system that both serves the needs of the economy and that contributes to a wider sustainability agenda which includes prudent use of natural resources and equitable access to jobs and facilities. Although the UK government has not set specific targets for emission reduction or accessibility for the transport sector, all local highway authorities in England are now required to set out five year programmes with commitments on progress on four national shared priorities, which include the reduction of polluting emissions from transport and improved public transport.
Transport practitioners have a key role to ensure that the foundations are laid now for the transport sector to be in a position to offer an integrated, resource efficient transport system in urban areas. Research has indicated that the principal barriers to achieving more sustainable transport strategies are poor policy integration and coordination, counterproductive institutional roles, unsupportive regulatory frameworks, weaknesses in pricing, poor data quality and quantity, limited public support and lack of political resolve. This paper reports on a study examining the efficacy of the decision support tools available to local transport officers to achieve more sustainable transport options in 16 local authorities in the UK.
Results from two questionnaires and a series of follow-up interviews are combined over a four year period to identify where significant support to transport officers is needed. The results suggest that technical and financial support is still necessary in the development, appraisal, monitoring and evaluation of integrated, sustainable, urban travel strategies.

Keywords: decision support tools; implementation barriers; local transport plans; sustainable transport

1. Introduction

This paper is one of a series on a UK research programme, DISTILLATE (Design and Implementation Support Tools for Integrated Local Land use, Transport and the Environment), which carried out research into six barriers deemed of particular importance to UK local authorities, and developed a series of products designed to support local authorities in their

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decision-making. The DISTILLATE research programme was funded under the UK Engineering and Physical Sciences Research Council's Sustainable Urban Environment initiative, which placed a particular emphasis on research which met the needs of practitioners. It also sought research proposals which were multi-disciplinary, reflecting the complex nature of the problems to be tackled, and multi-institutional, given a concern that no one institution might have the critical mass of research skills needed.

The DISTILLATE programme responded to these challenges by involving local authorities and related actors directly in the research programme and by bringing together the research skills of two interdisciplinary transport research groups, a planning school, a policy-oriented research centre, and a national research establishment. It was designed to help overcome those barriers to decision-making which were judged to be most serious, and most amenable to research-led solutions. It set itself a vision of helping to achieve a step change in the way in which sustainable urban transport and land use strategies are developed and delivered. Further details of the programme as a whole, and of the role of the project reported in this paper, are provided in the overview paper (May, 2009).

Transport officers employed by local government have a key role in providing an effective response to reducing the growing greenhouse gas emissions from the transport sector, which across the EU-25 member states have increased by 26% since 1990 (European Commission, 2007). Recent research has suggested that these officers find the scale, scope and complexity of sustainable transport issues daunting and that they struggle conceptually with understanding the components a sustainable transport strategy should have and lack knowledge of the relative merits of the actions available to them (Ferrary, 2008). This paper addresses these issues by examining transport officers' perceptions of the difficulties they encounter during the preparation and delivery of the local transport plan (LTP) and the efficacy of the design and implementation decision support tools available to them. This paper, therefore, addresses the question of whether transport officers have access to decision support tools that can assess the costs, benefits and efficiency of a wide range of 'innovative' policy options.

Integrating sustainability into the design and implementation of transport solutions requires a governance culture that promotes innovation and risk taking, particularly where there is little knowledge of the likely impacts and little experience of working with new partners. In England and Wales, a new system of 5-year LTPs was introduced in 2000 to secure the delivery of integrated transport strategies (May, this issue). The new LTPs are more objective-led focussing on tackling the environment, congestion, accessibility and road safety with individual targets agreed between the Department of Transport (DfT) and each Local Transport Authority (LTA). The LTP is, therefore, a new approach by central government to bring about more sustainable transport outcomes since local transport funding has been partly allocated according to the quality of transport planning, performance against agreed targets and deliverability of plan policies (DfT, 2004; 2005). This study has found that despite continuing improvements in the development, appraisal, monitoring and evaluation of integrated, sustainable, urban travel strategies there are still many weaknesses in the use of decision support tools to be overcome and continuing tensions between national and local priorities and inconsistencies between transport and other related sectors.

The sections that follow in this paper summarise the background knowledge on the concept of sustainable transport and the perceived barriers to effective implementation, explain in more detail the focus of the research, and the research methodologies used, and compare the findings of the three surveys undertaken.

2. Background knowledge on barriers to sustainable transport provision

The EU transport ministers' definition of sustainable transport has been widely accepted in Europe as a benchmark for what a local sustainable transport system could achieve. This states that sustainable transport:

- Allows the basic access and development needs of individuals, companies, and societies to be met safely and in a manner consistent with human and ecosystem health, and promises equity within and between successive generations;
- Is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as balanced regional development;
- Limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and, uses non-renewable resources at or below the rates of development of renewable substitutes while minimizing the impact on land and the generation of noise (Council of the EU, 2001).

Table 1. Priorities in The Implementation of A Sustainable Urban Transport Strategy

Bertolini and le Clerq (2003: 576-578)	**EU WG Sustainable Urban Transport (2004: 31-32)**
1. Increasing as much as possible the opportunities for walking and cycling.	1. Controlling car use, preferably through pricing of road use and/or parking, but with limits on road use and parking restrictions as a second best approach.
2. When walking and cycling are not realistic possibilities, increasing as much as possible the opportunities for transit while at the same time improving the environmental performance of transit (for example, cleaner and more efficient engines, shorter journey distances);	2. Improvements to public transit operation in the form of changes in fares, service levels, reliability, and quality.
- Most longer and less frequently made journeys should be capable of being made efficiently by public transit or other multi-occupancy vehicles	3. Land use policies to support (1) and (2) in the form of increased density, mixed development, and development in association with public transit.
- (1) and (2) should only be limited by the economic and environmental capacities of the area, whilst paying the full external costs and respecting wider economic, social and environmental objectives.	4. Improvements to the operation of the road network, including reallocation of road space, traffic calming, selective low cost capacity improvements, and support for less polluting vehicles.
3. When transit is also not a feasible option, improve the environmental performance of the car.	5. Information technology to help users to use the resulting transport and land use system efficiently and, through telecommunications, to travel less. 6. Improvements to walking and cycling within this context. 7. The use of 'soft' measures, including the raising of awareness to reinforce the strategy. 8. Improved management of freight within this context; and 9. Provision of new infrastructure only where it remains fully justified in the context of the measures listed above.

Within Europe there are, however, different views on how to interpret this aspiration and the priority which should be given to achieve a more sustainable transport system. Table 1 compares a 'deep green' approach with a 'light green' approach to sustainable transport. Bertolini and le Clerq's hierarchy is premised on radical behaviour change to walking and cycling as the main transport modes in urban areas, whilst the EU Working Group on Sustainable Urban Transport focus on improving the flow of traffic on the existing transport network through road pricing, information technology and traffic management measures.

Achieving either of these approaches in the European context appears fraught with organisational difficulties (Forrester et al., 2006). To understand some of these issues, the scoping study for the research involved a comprehensive documentary review of the barriers to policy implementation (Hull et al., 2007). This included studies in policy analysis on central-local government policy implementation, generic typologies of barriers from cross-national research on sustainable development funded through EU research programmes, detailed case studies of policy implementation and governance in specific local authorities, project evaluation studies commissioned by the UK government, and good practice guidance of how to overcome barriers. The most useful for gaining an understanding of the barriers to implementing sustainable transport strategies and schemes in the UK context were Atkins (2003; 2004); Chatterjee et al. (2004); DfT (2007); ECMT (2001); Pemberton (2000); Vigar (2000); Vigar et al. (2000); Wenban-Smith (2003). The perceived barriers to effective transport policy delivery can be categorised as political, legal, financial, technical, organisational and cultural barriers. The studies reviewed identify specific problems with:

- Lack of trust and cooperation between key stakeholders as a result of their different values and views on appropriate transport solutions;
- Fragmented government approach towards transport service delivery and poor linkages within local authorities between transport and other departments;
- Shortages of transport staff in local authorities and specific skill gaps;
- Lack of data and decision support tools to support the design and implementation of sustainable transport modes;
- Insufficient resources and inefficient procedures to access funding to design and deliver sustainable transport solutions;
- Unsupportive legal framework and jurisdictional boundaries which inhibit joint collaboration in scheme delivery;
- Institutional structures that favour economic development and car traffic.

3. Methods and Data Collection

Due to the close working relationship achieved with local transport officers in the early scoping studies for DISTILLATE this core group of transport officers in 16 local authorities became the sample which was used to understand the difficulties local transport officers face in designing and implementing sustainable transport strategies and schemes. The composition of, and collaboration, with these local authorities is discussed more fully in May (2009). The research focused on the *financial*, the *technical* and the *organisational* barriers identified in the literature review, with surveys carried out in 2004, 2005/6 and 2007. A range of qualitative methods were used to collect data on the attitudes, values, beliefs and motives of local transport officers and other local government officers they work with. The methods included ethnographic methods, documentary reviews of research on barriers to service delivery; case study analysis of the management structures in local authority organizations; questionnaire surveys of the use of tools in transport planning (monitoring, option generation, funding, modelling, option appraisal, decision making) and the intra- and extra-organisational issues in collaboration; and in-depth interviews with national experts and local practitioners in five different service sectors. Two of the surveys used self-administered questionnaires which are a relatively cost-effective way of collecting large amounts of standardised data on the perceptions of respondents. The first questionnaire survey achieved nearly a 100% response rate, with two authorities both omitting to complete one of the sections (94 out of 96 sections completed). The second questionnaire received

a 69% response rate (11 out of 16 authorities). This principally can be accounted for by staff turnover in the core sample authorities, as the original contacts moved on, but also due to the onset of interaction fatigue after four years of the DISTILLATE project.

Whilst questionnaire surveys have the advantages mentioned above, they do not allow for clarification of questions or answers. To explore the issues raised in the first survey an in-depth interview approach was, therefore, used to test the initial findings on the difficulties encountered when interacting with other policy sectors and stakeholders in the delivery of more sustainable transport solutions and the efficacy of the decision support tools available. The remainder of this section explains the three surveys in more detail. The contributions in this special issue explain how the findings have been used in the DISTILLATE research. The detailed survey reports can be found on the project website (http://www.distillate.ac.uk/outputs/reports.php).

The phase 1 survey was self-completed by transport officers in the 16 local authorities and comprised a combination of open and closed questions. The questionnaire was designed with separate topic sections to encourage specialist input in responses where required. The language, presentational style, and length of the questionnaire was first piloted and tested with local transport officers outwith our core sample, and changes made. The final version contained 60 questions designed to answer the following thematic issues:

1. Which stages in the process of local transport strategy and scheme delivery are regarded as being most problematic?
2. What difficulties are encountered when working with other stakeholders?
3. How do internal working arrangements contribute to (or hinder) the technical decision-making process?
4. Which policy instruments are most difficult to implement, and at which stage(s) of decision making are they most incongruous?
5. What specific difficulties are faced in the development, compatibility and use of the following design and implementation decision-support tools and how can they be improved:
    1. monitoring;
    2. option generation;
    3. modelling; and
    4. appraisal?
6. What funding sources are available, and how do funding and phasing regimes impact upon the implementation and outcomes of local transport schemes?

To elicit self-reflection by the respondents both *satisfaction* and *importance* scale questions were used. They were asked how "satisfied" they were about practices within their own authority using the following scales (as used in MORI, 2001): *Very satisfied*; *Fairly satisfied*; *Not very satisfied*; *Not at all satisfied*; and *Don't Know*. A similar scale was used to assess how important a particular issue was to them. A *seriousness* score was derived from the product of *importance* and *satisfaction* questions (See Hull and Tricker, 2005; 2006 for a fuller discussion).

The phase 2 survey was designed to uncover how "*other parts of the authority*" interact with local transport officers in the design and delivery of transport strategies and schemes. The phase 1 survey identified that other departments in the local authority were important stakeholders in the delivery of transport policy, but also that transport officers were not entirely satisfied with their contribution to transport strategy/scheme design and delivery. The phase 2 survey therefore interviewed 29 officers in transport planning, public health, land use planning,

environmental protection, and corporate strategy in five of the core sample authorities. The research employed qualitative methods (documentary review, network analysis, expert reviews and one-to-one interviews). Whilst the phase 1 survey examined the relationship between actors and the LTP process, phase 2 sought to examine the relationships between actors themselves through the LTP process and through the use and development of tools.

The phase 2 interviews (Hull et al., 2006) focused on:

1. The professional background and training of each professional
2. The links between their work and the production and implementation of the Local Transport Plan
3. The transport related strategies and policies in their sector and how these are developed
4. Their involvement in the design of the transport aspects of specific developments/ schemes
5. Their perceptions of the technical, organisational and external barriers to interactive design and implementation of policies and schemes.

The phase 3 questionnaire in the autumn of 2007 was partly designed to examine whether the opinions of the 16 core sample authorities had changed in the intervening period since the first survey in 2004. 25 questions and sub-questions were repeated in the second questionnaire and, where appropriate, the names of organisations were updated. The layout and format of the questionnaire remained the same. 18 new questions which relate to the design and the targeting of the DISTILLATE products were included. There are, however, some contextual factors that may affect the comparability of the findings between the two surveys. Whilst the phase 1 questionnaire was completed during the period when the sample authorities were developing their second LTP, completion of the second questionnaire occurred during the initial stages of the implementation of LTP2. There was also a slight change in the categories included in the policy tools between the two questionnaire surveys. The second questionnaire split the category "demand restraints" into:

- Demand restraints: parking controls
- Demand restraints: congestion charges
- Demand restraints: other.

4. Research Findings

This section compares how the perceptions of the barriers related to the technical make-up, characteristics and applicability of tools, procedures, and methodologies changed during the research period (2004-2007). Table 2 summarises the most significant barriers across the issues of indicators and monitoring, option generation, funding, prediction, appraisal, and use of tool outputs in decision making identified in the three surveys. Note that these surveys drew a different sample of respondents from the core group of 16 local authorities. Table 2 draws on the textual comments in these surveys to give a broad-brush of the issues as they are perceived by respondents at the different sample dates.

Table 2. Significant Trends in the Types of Barriers Experienced by Transport Officers in the Delivery of Local Sustainable Transport Schemes

	2004 questionnaire survey	2005 case study interviews	2007 questionnaire survey
Indicators and monitoring	There were difficulties in monitoring **walking and cycling, accessibility, and levels of congestion** Difficulties in **managing indicators** across the range of indicator sets in use in transport planning	The **lack of robustness** of LAA indicators; The highly **specific nature** of land-use (AMR) indicators. **The high number of indicator sets** in use for transport-related monitoring in local authorities. Picking up **walking journeys** as part of multi-modal trips.	National government **performance auditing** of local government hinders decision making on sustainable transport.
Option generation	Constraints on the generation of scheme options due to the lack of **funding to implement some types of scheme**. The **scope of policy options is limited** by a mixture of nationally, regionally and locally-set priorities.	**Pet schemes** (e.g. long-standing options developed by senior officers) may be pushed forward when there is a time constraint, e.g. during LTP development. Certain types of scheme are made more attractive by the **availability of specific funded pots.** Constraints are imposed on implementing cost-effective and simple solutions by **risk-averse interpretation of national design guidance.**	Constraints on the generation of scheme options due to the lack of **funding for option development and to implement some types of scheme** The **scope of policy options is limited** by a mixture of nationally, regionally and locally-set priorities.
Funding	Adverse effect on the **development of strategies**, i.e. lack of resources for option generation and modelling processes Adverse effect on the **implementation and operation of schemes.**	Adverse effect on the availability of **staff time** (e.g. because of cost-effectiveness agenda) Adverse impacts upon **scheme prioritization and delivery** processes due to rules in specific funding streams. Difficulties occur in **delineating contributions** between partners in joint funding packages across sectors.	Funding is the **most problematic stage** in the process of local transport strategy and scheme delivery. Adverse effect of certain sources in terms of **scheme delay** or meeting **scheme objectives.** Adverse effect on the **implementation and operation of more sustainable measures** due to lack of revenue funding.
Prediction	**Organisational resources and technical characteristics** negatively affect the use of models in transport planning.	A lack of capabilities **to understand and engage** in the modelling process in **other (non-transport) sectors. Skills** to interpret/comment on model outputs is limited in other (non-transport) sectors. **Model development timescales are long** and the **timeliness** of model outputs can be poor. The **transparency/openness** of the modelling process and its assumptions could be improved in local authorities. **Unpredictability** of modern lifestyles and human travel behaviour.	Dissatisfaction with ability to **model certain policy instruments**: demand restraint, public transport fares, traffic management and land use measures. Unable to model **cross-sectoral factors** such as social, environmental and health benefits. Unable to model **travel shifting, lift sharing, improvements to walking/ cycling** and influence of destination choice.

Continued Table 2.

Appraisal	Some impacts are not well catered-for in current appraisal mechanisms (e.g. **impacts on public health and the economy**)	As a gateway to funding, appraisal can distort the selection and design of schemes in order to satisfy **national appraisal criteria (based around value for money)** rather than addressing locally-derived priorities and objectives. The integration of public health concerns into appraisal is limited by the **non-statutory nature of HIA. SEA** is as yet not well integrated into the mindsets of local transport planners. **Regional economic impacts** are hard to factor into major scheme appraisal. The effects of a number of policy instruments **on air quality and health** are unknown or lack evidence. **Local financial constraints** affect the carrying-out of the appraisal process, particularly building the evidence base for new and innovative policy instruments (e.g. Low Emission Zones)	Tension between the **requirement to show value for money** and the desire to improve the sustainability of the transport system. National appraisal criteria bias towards car time savings at expense of public transport. Difficult to enumerate **sustainable transport's benefits**
Use of tool outputs	The **diversity and numbers of stakeholders** involved in local transport delivery. Low levels of internal discussion of transport problems within local authorities and a lack of effective **inter-departmental working.**	**Poor management of data** from across departments to inform the corporate delivery process. Parameters are imposed by **ex-officio decision-makers and delivery agencies outside of local authorities.** The effects of **personal and institutional characteristics** on effectiveness and degree of cross-sector working. Different degrees of **cultural/professional awareness and understanding** of the principles of sustainable transport. **Spatial boundary and scale issues** negatively affect joined-up working between sectors. The effects of **organisational change** on organisational behaviour and links between individuals from different sectors in the delivery of transport solutions.	**Staff time and staff resources** limit use which can be made of tools and tool outputs. **Public acceptability** of demand restraint measures influence option choice. **Lack of funding** for infrastructure and operational subsidies for innovative schemes.

To overcome, to some extent, the changes in the sample between the three survey periods the analysis in the next section incorporates findings on the highest rated barriers facing the 11 local transport authorities who responded to both questionnaire surveys in 2004 and 2007. This like-with-like analysis uses a seriousness score (SS) computed from the answers to pairs of "importance" and "satisfaction/ improvement" questions. The SS scores could not be compared in all cases. However, there are five pairs of questions which were common to both questionnaire surveys. Respondents were asked to rate the importance of a specific variable in the delivery of a sustainable local transport strategy and subsequently they were asked how satisfied they were with their ability to use/ deploy that variable in practice. The SS is a 'net impression' calculation based on: (average satisfaction OR improvement scores) X (factor derived from corresponding average importance scores) (PCG, 2002). Values above 0.3125 are defined as 'serious', which implies that attention should be given to addressing the perceived barrier.

4.1 Stages in the delivery of local transport strategies and schemes

As can be seen from Table 2 many of the issues raised by transport officers and their colleagues in local government revolve around the problem of gaining finance to implement transport strategies and schemes. Financial problems are particularly accentuated in government systems where there are no tax-raising powers at the local level. This is the case in the UK. Obtaining funding and modelling were the highest rated problematic stages in the delivery of sustainable transport strategies and schemes in both the 2004 and 2007 surveys. Whilst operational monitoring and evaluation was the third ranked problem in the 2004 survey, this was only considered to be "very problematic" or "fairly problematic" by three authorities in 2007. As previously explained, this may well be a timescale issue with monitoring being more of a problem during the LTP development stage than during the plan delivery stage.

4.2 Indicators and monitoring

The 2004 survey found that various aspects of the way indicators are selected and applied in practice were of concern to transport officers including their ability to reflect objectives, their use in developing targets and the ease with which they are understood in the monitoring process. Specifically problematic were the use of indicators for target-setting and to ensure consistency with other local authority responsibilities (such as land-use planning and sustainable development). It was also considered that the issues of cycling and walking, accessibility, and congestion were not well reflected by the indicators in 2004. It was hoped by respondents that the indicators to be used in the revised performance management system for local authority services (Comprehensive Performance Assessment (CPA) and Public Service Agreement (PSA)[2]) would have the potential to monitor the impact of the transport sector on sustainable development in the future. The SS values in 2007 suggest, however, that the use of indicators for target-setting (0.47) and appraisal (0.41) are still causing concern.

The interviews in 2005 and 2006 confirmed the potential of the CPA and the PSA indicator sets and the Local Area Agreements (LAA)[3] as mechanisms which could integrate the inputs across all policy sectors at the local level. Two issues would first need to be addressed. The technical problem of identifying meaningful quality of life (QOL) indicators would need to be resolved and data shortages relieved through data sharing across service sectors. These problems were reiterated in the 2007 survey where it was considered that Strategic Environmental Assessment had made no difference to policy decisions because it lacked clear definition, and that Health Impact Assessment was ineffective since it was not a legal requirement in the UK. Nevertheless, it was thought that both evaluation methodologies provide a key input to adaptive management to achieve policy integration. The land use planning framework was also thought to have potential to integrate transport and land use indicators.

There were changes in perception of the importance of indicators between the two questionnaire surveys. In 2004 *water pollution by transport* and *distribution of benefits across society* were perceived to be "not important" by all respondents in 2004. By 2007, they had risen in importance, with 27% and 40% of respondents respectively considering these indicators as fairly or very important. Similarly, the *quality of street environment*, *operating costs*, *land-take* and *heritage* indicators were perceived to be more important in the 2007 survey. Surprisingly, respondents in 2007 felt that *air-*

[2] Both of these procedures aim to improve the delivery of local public services in England. The CPA is carried out by the Audit Commission, an independent public body, every three years on average using a range of transport and land use indicators to assess local authority performance. PSAs are voluntary agreements between a local authority and central government focusing on targeted outcomes (DCLG, 2007).

[3] LAAs are being implemented from 2007 to help deliver the central government's Sustainable Community Strategy. They consist of an agreed set of priorities and the criteria for performance monitoring between central government and the main strategic organisations in the local area (DCLG, 2007).

quality and *cycle use* indicators were less important than in 2004. There were specific suggestions to improve monitoring (Marsden and Snell, 2009).

4.3 Option Generation

The study has established that the tools and techniques currently used by transport officers for the generation of different options are relatively limited. Currently they rely on their own professional judgement and ideas from stakeholders for inputs to option generation in strategy development, and their own judgement and national/ regional guidance for generating specific options for medium sized schemes.

Table 3 presents the Seriousness Scores (calculated as the product if importance and satisfaction scores) for each of a number of inputs to option generation. Those with the highest scores are typically more important and generate less satisfaction than those with the lowest scores.

Table 3 shows that local transport officers are calling for more attention to be given to improving national or regional policy guidance for the development of alternative transport strategy options. This was the most 'serious' rated variable in 2004 (0.53) and the second most serious issue to address in 2007 (0.39) behind how to incorporate the ideas from stakeholder engagement in strategy development (0.40).

Respondents in both questionnaire surveys felt that more resources and institutional support would be required to facilitate improved option generation. In 2007, nearly half of the respondents considered that the current levels of funding for transport and the resources available for option development hinder the development of a broad range of options. These two factors, and public and political acceptability, were also perceived to specifically hinder the development of a range of options for small schemes. Some respondents considered that improved methods for road-space re-allocation schemes and community-led local transport initiatives would be very useful. Transport officers in Passenger Transport Executives (sub-regional agencies) would welcome new option generation tools and methods for city and regional transport/land-use strategies and accessibility planning strategies and schemes (Jones et al., 2009).

Table 3. Inputs into strategy and scheme option generation

Inputs for developing strategies and schemes	Seriousness Score	
	2004	**2007**
National or regional policy guidance (strategy)	0.53	0.39
Professional judgement (scheme)	0.40	0.32
Professional judgement (strategy)	0.40	0.34
National or regional policy guidance (scheme)	0.39	0.37
Tools to assist in option generation (strategy)	0.38	0.35
Ideas from stakeholder engagement (scheme)	0.37	0.33
Local authority best practice (scheme)	0.37	0.30
Previously developed proposals (scheme)	0.36	0.25
Ideas from stakeholder engagement (strategy)	0.36	0.40
Local authority best practice (strategy)	0.33	0.26
Tools to assist in option generation (scheme)	0.31	0.33
Previously developed proposals (strategy)	0.25	0.27

4.4 Funding

Throughout the four years of research the local government officers surveyed were unanimous that the funding sources available for transport schemes distort transport scheme selection and choice. Given the perceived barriers to scheme delivery from these funding sources, it is

surprising that few authorities in either survey were aware of the more innovatory sources of funding (Binsted and Paulley, 2009). Only a few authorities have seriously considered using, or had used, workplace parking levies, fare increases, the business rate levy, and road user charging.

Arguably the most serious funding barrier is the perceived lack of revenue funding for scheme design (eg. staff costs) and the implementation of sustainable modes (including operational and maintenance subsidies). Local transport officers have also experienced delayed implementation and the truncation in the delivery of scheme objectives when using specific sources of funding. In 2004 private sources of funding, major highway grants, and regeneration–related funding streams were the sources causing the most severe delays. In 2007, delays to scheme delivery were most likely to be caused by major scheme project funding, negotiated land use planning agreements, and EU grants. The latter two funding sources were also seen to hinder the meeting of scheme objectives by the 2007 respondents. Authorities with experience of negotiating funding through a Private Finance Initiative (PFI) contract considered this a very inflexible source of funding with little direct consideration of sustainability in the 2004 and 2005/06 surveys. Few scheme delays were experienced when using their own LTP settlement. Ways of reducing these problems are discussed in Binsted and Paulley (2009).

4.5 Prediction

The likely impact of many policy instruments can best be estimated by using predictive models. Transport officers in both surveys were asked for their perceptions of the barriers to predicting the impact of different policy instruments. Table 4 shows the Seriousness Scores (as explained prior to Table 3) for the two surveys. Demand-restraint measures and public transport issues were at the forefront of the problems in prediction in 2004 with SS values of 0.59 and 0.55 respectively. By 2007, the three most problematic policy instruments to predict were bus service improvements, land use measures and soft measures, which each had SS values of 0.48.

Table 4. Modelling of Policy Instruments

Policy Instrument	Seriousness Score	
	2004	**2007**
Demand restraint (eg. parking controls/ congestion charges)	0.59	0.45
Public transport fares	0.55	0.46
New/ enhanced bus services	0.53	0.48
Land use measures	0.53	0.48
Light rapid transit	0.46	0.39
Soft measures (eg. awareness schemes, travel planning)	0.44	0.48
Walking and cycling provision	0.42	0.33
New road infrastructure	0.40	0.42
Information provision	0.35	0.34
Traffic management	0.35	0.44

In 2004 the highest rated constraints on the utilisation of models in local authorities were staff training and technical expertise (SS: 0.64) and the resources to develop models (SS: 0.64), followed by the availability of data to input (SS: 0.56) and the model output presentation (0.51). Some of these issues were raised in the second survey: particularly that model/tool outputs are unclear to politicians and other service sectors; and that the communication on model assumptions and timescales needs to be improved in order to inform decisions in other sectors. Whilst over the three surveys there is a perception that modelling representation is improving and that there is more data, models are still considered by local transport officers to be unable to model cross-sectoral factors (eg. social, environmental and health benefits) travel shifting, car

sharing, improvements to walking and cycling, and the influence of destination choice. Shepherd et al. (2009) discuss ways in which these problems have been addressed.

4.6 Appraisal

Most respondents in 2004 thought that travel time continues to have too much importance as an objective in scheme appraisal. Two thirds of respondents also felt that this was in conflict with the objectives for sustainable transport. It was strongly felt by other professions in the 2005/06 survey, that there are inconsistencies between the conventional multi-criteria appraisal method used in the UK, the growing emphasis on value for money appraisals, and the assessment of performance against targets. Specifically, they considered that government appraisal criteria distorted scheme selection choice through an excessive focus on 'value for money' criteria (Table 2).

When asked about the appraisal of the policy instruments listed in Table 4, local transport officers in 2004 had serious reservations about the appraisal of demand restraint measures (SS: 0.62), public transport fares (SS: 0.52), LRT (SS: 0.49), and land use policies (SS: 0.49). Few instruments overall received ratings in the 'very satisfied' category. They also felt that appraisal methodologies did not meet their expectations for assessing accessibility**,** the economy and a number of distributional impacts**.**

More specific questions were asked in the 2007 survey concerning the use and importance of indicators in the appraisal of small and medium-sized transport schemes. Construction cost, followed by accident, accessibility, and operating cost indicators was considered the most important indicator by the majority of respondents. Biodiversity, health impacts, noise, townscape, heritage and water pollution impacts from transport were seen as having a low level of importance for assessing small and medium transport schemes. These are also issues of sustainability that transport officers do not have much confidence in judging.

Many respondents in 2007, however, stated they have confidence in the indicators their authority has developed and that these are especially important for target setting and in appraisal. However, target setting and appraisal recorded the highest seriousness scores of 0.47 and 0.41 respectively for the use of indicators in the decision making process. Page et al. (2009) discuss approaches to these problems.

4.7 Involvement of stakeholders

In the UK context, there are a number of stakeholders important to the delivery of transport strategies and schemes. Table 5 shows the changes in Seriousness Score values (as explained for Table 3) for each of a number of potential stakeholders between the two survey dates.

In 2004, the most serious problems arose with involvement of transport operators, business interests, the public and elected members in strategy and scheme delivery. By 2007, the involvement of transport operators was seen as less problematic, but dealing with business interests, the public and elected members remained problematic. These issues of stakeholder engagement led to the development of advice on good practice in partnership working (Forrester, 2009).

Table 5. Involvement of stakeholders in the overall transport strategy and scheme delivery process

Stakeholders	Seriousness Score	
	2004	2007
Transport operators	0.55	0.42
Business interests	0.52	0.48
The public	0.51	0.50
Elected members of your authority	0.51	0.48
Department for Transport	0.49	0.37
Other public sector services	0.47	0.42
Local Strategic Partnership	0.47	0.41
Strategic Rail Authority/ Network Rail	0.46	0.33
Officers from other departments in your authority	0.46	0.41
Regional Assembly	0.40	0.31
Highways Agency	0.39	0.31
Regional Transport Board	-	0.38
Government Office for the Region	0.36	0.35
Regional Development Agency	0.36	0.31
Neighbour Authorities: Members	0.32	0.36
Neighbour Authorities: Technical officers	0.32	0.36
ODPM/Dept of Communities and Local Government	0.30	0.33
Consultants	0.23	0.20

Note: the Department of Communities and Local Government was previously called the Office of the Deputy Prime Minister (ODPM). The Regional Transport Boards were not in existence in 2004.

The effective use of decision support tools is also affected by the intra-organisational barriers that local transport officers have to overcome in their work. Table 6 presents the Seriousness scores (see Table 3) for each of a number of potential hindrances. The seriousness of these issues has arguably become more of a problem than in 2004, although as Table 6 shows, the overriding problem of staff time and resources remains the same. The issue of time and resources impacts more forcefully on the smaller authorities.

Table 6. Hindrances to Integrated Planning & Decision Making

Organisational factors	Seriousness Score	
	2004	2007
Pressure on staff time and resources	0.63	0.67
Different timing of writing/publishing plans	0.41	0.45
Divided responsibility for delivery	0.33	0.37
Different stakeholder engagement procedures	0.33	0.44
Different objectives between departments	0.27	0.33
Different physical locations of departments	0.25	0.25
Organisational and management structures	0.24	0.26
Different technical staff writing plans	0.21	0.22
No formal arrangements for joint working	0.20	0.26
No guidance on integration	0.19	0.25
Different political agendas within authority	0.17	0.30

4.8 Application to policy

Both questionnaire surveys collected respondents' perceptions of the importance of various types of policy instrument to transport strategy and their satisfaction with their ability to employ them. Table 7 shows that in 2004 bus services (SS: 0.77), demand restraint measures (SS: 0.68), and public transport fares (SS: 0.68) posed the greatest problem in terms of design and delivery. However, by 2007 public transport fares (SS: 0.72) and Light Rapid Transit (SS: 0.63) were perceived to be the most problematic policy instruments to implement within a sustainable transport strategy.

Table 7. Contribution of Policy Instruments to local transport strategies

Policy Instruments	Seriousness Score	
	2004	**2007**
New/enhanced bus services	0.77	0.59
Demand restraint measures	0.68	-
Demand restraint - parking controls	-	0.54
Demand restraint - congestion charges	-	0.50
Demand restraint - congestion - other	-	0.46
Public transport fares	0.68	0.72
Land use measures	0.58	0.51
Light rapid transit	0.50	0.63
Soft measures	0.43	0.40
Traffic management	0.42	0.39
Information provision	0.40	0.37
Walking and cycling provision	0.37	0.44
New road infrastructure	0.27	0.30

Note: Demand restraint measures in the 2007 survey were disaggregated by category

5. Conclusions

This study has undertaken a longitudinal study of local transport officers' perceptions of hindrances, opportunities and areas of satisfaction with their delivery of sustainable local transport solutions in 16 local authorities. It has focused on the use of decision support tools in the development and implementation of their LTPs. The research identified several deficiencies in the ability of the available tools to support transport officers in the design and implementation of sustainable transport measures. These are:

- The inability to control public transport fares in the UK is the most serious barrier (highest seriousness score) to achieving sustainable transport in the 2007 survey.
- The government's 17 core indicators used to monitor transport policy interventions are too narrowly defined to support the evaluation of sustainable strategies and schemes.
- Option generation tools are still undeveloped, and the generation of alternatives to achieve an objective is rarely given the attention it deserves. Transport officers tend to rely on their professional judgement, ideas from stakeholders and national and regional guidance to generate options.
- A key issue for enhancing the provision of more sustainable modes (buses, cycling and walking) is access to funding for the design, implementation, operation and maintenance of these modes. The general feeling is that the government's approach to transport investment priorities is driven by travel time savings, projects that can be delivered quickly, and infrastructure that will unlock housing development.

- Whilst modelling data representation is improving and data availability is increasing, models are unable to model cross-sectoral factors (eg. social, environmental and health benefits) travel shifting, car sharing, improvements to walking and cycling, and the influence of destination choice.
- Particular appraisal problems include the need for a simpler method for appraising small schemes, such as improvements for pedestrians and cyclists, the assessment and representation of distributional impacts and the potential inconsistencies between the results given by conventional appraisal methods and the sustainable transport policies local authorities might want to adopt.
- The key barriers to the use of tools are staff time and resources, divided responsibilities between different public and private agencies and difficulties of integrating effort.

The second more detailed survey found that by far the biggest motive for organisations and departments to work together on sustainable transport strategies comes from the priority to reduce CO_2 emissions from the transport sector. The barriers uncovered through this research suggest that policy and organisational integration has not, as yet, had sufficient force to bring about the step-change hoped for. Without strong project champions in top politicians and department heads, innovative sustainable transport policies do not have much force at the local level. In the current UK policy climate, local authorities are still waiting for the financial, technical and legislative tools to overcome public distrust of demand restraint measures and transport alternatives to the private car.

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