

# **Transferring research on sustainable urban transport policy into practice**

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## **ABSTRACT**

It is widely accepted that cities understand what action is needed to achieve greater sustainability in urban transport, but that there are several barriers to the pursuit of such actions. While research is able to suggest ways of overcoming these barriers, the process of transferring research results into practice is itself uncertain. This paper focuses on experience of such policy transfer and on ways of improving the process. The principles of policy transfer are presented, together with a summary of the requirements for effective policy transfer highlighted in case study cities in Europe and North America.

The limits on policy transfer are illustrated based on experience in a five year UK research programme, DISTILLATE, which developed decision-support tools designed to help overcome the barriers to sustainable urban transport policy. The programme resulted in a set of 18 decision-support tools, and an overarching web-based tool designed to help local authorities identify the tools which were most appropriate to their needs. The paper considers in detail experience in the dissemination of five of the outputs produced. It compares that experience with the findings of research on the policy transfer process. Recommendations are drawn for further research, and for ways of transferring such research more effectively into practice.

*Keywords: urban transport; decision-making; dissemination*

## **1 INTRODUCTION**

Many governments are now advocating the development of sustainable urban transport systems, and the European Commission has issued a Green Paper and an Action Plan on the pursuit of such a policy for all European cities (EC, 2007; 2009). In its Action Plan, the Commission advocated the development of sustainable urban transport strategies in all European cities. Some countries, such as France with its *Plans de Déplacements Urbains* (Offner, 2006), and England, with its Local Transport Plans (DfT 2004; 2009), have already implemented such arrangements.

As early as 1995, the European Conference of Ministers of Transport (ECMT, 1995) had focused attention on the importance of improvements in public transport, better management of road space and controls on the demand for car use as the key elements in a sustainable urban transport strategy. A subsequent review (ECMT, 2002), however, concluded that the implementation of such sustainable transport strategies was “more easily said than done”. The review highlighted, as the principal barriers, 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 led in turn to the publication of a set of key messages to national governments, who were seen as crucial in enabling and supporting local government initiatives (ECMT, 2002). A follow-up to that study confirmed its findings and identified a further barrier of weaknesses in the process of policy formulation (ECMT, 2006; May and Crass, 2007). It sent a further key message that “national governments should support local or regional authorities through technical, financial or other means as necessary and appropriate in the development, appraisal, monitoring and evaluation of integrated, sustainable, urban travel strategies”.

The development of decision-support tools to underpin such government support is thus an important focus for research. However, evidence from the literature on policy transfer indicates that there is a further set of barriers to the transfer of good practice from academia to practice and between leader and follower cities. It is these barriers to the take-up of decision-support tools which are the focus of this paper. We start, in Section 2, by reviewing the literature on policy transfer, and the experience of a recent study funded by the Volvo Foundation. We then illustrate these barriers through our experience in a recent 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 decision-making.

In Section 3 we outline the DISTILLATE programme and its outputs. In Section 4 we describe the approach to disseminating the DISTILLATE products. In Sections 5, 6 and 7 we consider experience to date with three of the DISTILLATE products. We discuss the implications of this experience in the light of the policy transfer literature in Section 8. Finally, we draw conclusions and offer some recommendations in Section 9.

## **2 POLICY TRANSFER AND THE ROLE OF RESEARCH**

Policy transfer is ‘a process in which knowledge about policies, administrative arrangements, institutions etc. in one time and/or place is used in the development of policies, administrative arrangements and institutions in another time and/or place’ (Dolowitz and Marsh, 1996). A review of the literature on the study of policy transfer and its application to transport and planning has examined the key elements to be considered in the process of policy transfer (Marsden and Stead, 2010). It found that the need to develop and consider new policies is motivated at a local level and most often occurs as a result of an anticipated failure to achieve a policy objective or of the collapse of a planned scheme or policy. Epistemic communities of practice are identified as being important in the development and spread of ‘accepted practices’ and models of good practice of policy (Dunlop, 2009). Academics form one element of the community of practice within which policy transfer occurs and should, therefore, have some influence in the development, adoption and spread of policy ideas.

The Volvo Educational and Research Foundation commissioned a study in 2008 of the reasons why innovations in the transport sector seemed to take so long to achieve widespread adoption and to explore the extent to which academic research informs practice in the transport sector. The Foundation funded an initial literature review and a set of interviews, with topics based on the literature review to further investigate the process of policy transfer and the role of academics within it. Interviews were conducted in 11 cities in Northern Europe (Leeds, Edinburgh, Stockholm, Copenhagen, Bremen and Lyon, Nancy) and in North America (Vancouver, Dallas, San Francisco and Seattle). Full details of the study are available in Marsden et al. (2009), and a summary of key findings in Marsden et al (2010).

The interviews found that different cities had quite different approaches to learning about policies from elsewhere. Some had very strong networks of contacts which provided an informal but regular source of ideas. Others were more insular and less likely to rely on external sources. The role of academics was limited compared with local officials, private suppliers and consultants. Academics were not identified as being initiators of policy searches within cities (e.g. by lobbying) but were involved in assisting with elements of the transfer of ideas in almost one fifth of all of the innovations studied.

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It was notable in particular within the Northern European examples that the cities accessed very little academic material and did not prioritise this as a source of learning. This was less the case in the Northern American cities but even there, time was a major constraint on making use of these resources. In many cities academics were involved in expert panels but there was a feeling that good use was not being made of academic resources.

Brownson et al. (2006) reviewed the motivations and working practices of academics and policymakers to try to understand why the gap between research and practice exists. The most relevant of the issues identified as major challenges to the deployment of research to inform practice were:

- Clash of cultures – This relates in particular to the research quest for clearer testable hypotheses, economically optimal solutions or more observational reflective research and the need for policy makers to balance interests and make pragmatic decisions.
- Poor timing – Scientific studies are not always conducted at the right time to inform policy and there can, in particular, be very long gestation times between proposal generation and delivery of research results.
- Ambiguous findings – Discussion of uncertainty of outcomes is more embedded in the research culture than in the realities of policy development and implementation.
- Personal demands – It takes time to develop a good working relationship between the research team and the policy makers. This can be aggravated by turnover of staff during the project.

Other important issues identified through the Volvo study, which are relevant to the ability of academic research to inform practice, were:

1. Cities are actively looking to learn from another but this process is unsystematic and sometimes inefficient.
2. The search for new policies is constrained by a lack of resources, particularly personnel. Academic literature was given a very low priority as a source of information (see also Veshosky, 1998 and Wolman and Page, 2003).
3. Informal networks and information sharing based on professional contacts are the predominant methods of initial knowledge transfer. There was however little cross-over between academic and practitioner networks, particularly in Northern Europe.
4. Local context is critical in determining whether policies will transfer well across cities and lack of fit is one reason for limited transfer. The evaluation literature does not always pay sufficient attention to transferability and is thus limited in value.

5. Institutional barriers to policy transfer, these are more likely to influence what gets implemented rather than what gets considered.
6. Key facilitators to overcome barriers to implementation are:
  - a. A supportive political environment;
  - b. Sufficient staff resources to commit to the projects;
  - c. A culture of engaging with other cities and a structure that allows for staff at all levels to seek out information by contacting staff internally and externally at different management levels;
  - d. An internal organisational culture to try new things; and
  - e. co-funding of implementation from other government tiers or the private sector.
7. Academic research is one potential source of information on innovation and implementation but one which is underutilised in many cities. This was particularly true of the European cities compared with those in North America.
8. Consultants typically also played a minor role in providing such information.

The practitioners in the Volvo interviews were asked to consider what solutions would help improve the search for new policies and practices. The recommendations were mapped against the barriers identified through the interviews and a prioritised set of proposals was generated based on the number of barriers they might address and the extent to which they might address them. The key recommendations of relevance to this paper were:

1. Improved information searching: The strengths and weaknesses of existing search tools and knowledge centres should be identified to determine whether these tools can be modified, whether the tools are functional but are not being used effectively or whether new tools are required.
2. Investment in joint research: Focused co-research between academics and practitioners should be encouraged. When funding is available to both parties this provides a stimulus but attention must be given to evaluating the true degree of interaction and knowledge transfer both promised and delivered.
3. Concise policy-focused literature: Research reports are often too technical and time consuming to read; attention should be given to how the research is presented and for whom. This can be required within existing research programmes, and possibly applied retrospectively to past research results.

### **3 THE DISTILLATE PROGRAMME**

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

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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 (May, 2009; [www.distillate.ac.uk](http://www.distillate.ac.uk)).

DISTILLATE 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. It attracted participation from 16 local authorities, who between them reflected many of the different types of local government structure in the UK (Marsden and May, 2006). A decision was taken not to include local authorities in London, whose decision-making processes had been greatly enhanced by the creation of the Greater London Authority (Marsden and May, 2006).

An initial scoping study was conducted in which the 16 local authority partners and the research team jointly developed a long list of some forty potentially researchable issues. These were assessed in terms of their likely contribution to the desired step change, the feasibility of researching them and the extent to which they might form a coherent research programme. The resulting shortlist was then grouped into nine priority research areas which were of most importance to local government and could be the focus of an integrated multi-disciplinary research programme. Seven of these were funded, and are listed below, with a reference to an overview paper describing the outcomes of each:

1. to document and review the barriers to the delivery of sustainable strategies (Hull, 2009);
2. to provide guidance on the development of an effective set of core indicators for use in strategy formulation, forecasting and appraisal (Marsden and Snell, 2009);
3. to develop new methods for generating appropriate strategy and scheme options (Jones et al, 2009);
4. to develop approaches for overcoming the financial barriers to effective implementation (Binsted and Paulley, 2009);
5. to enhance existing predictive models to reflect the impact of the wider range of policy instruments, and to facilitate interactive strategy development (Shepherd et al, 2009);
6. to improve the methods used for appraisal to reflect more effectively the requirements of sustainability (Page et al , 2009); and
7. to support the more effective collaboration between the agencies responsible for transport strategy development, both within and between local authorities (Forrester, 2009).

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The initial surveys conducted within the first research area (Hull, 2009) played a pivotal role in developing the detailed research approaches for the other six projects. They, the parallel work by consultants for the Department for Transport (Atkins, 2005), and a review of other studies, were used to generate a list of principal barriers to the development and delivery of sustainable transport strategies (Hull, 2009). On this basis, each of the six technical projects conducted a literature review, and produced a detailed research plan designed to enable it to develop tools and products which would help overcome those barriers which were particularly relevant to its objectives.

The involvement of the 16 local authority partners in specifying the barriers to be researched was the first stage in a four year programme of partnered inquiry (Forrester, 2009). In the next stage the local authority partners offered a series of practical case studies which helped illustrate these barriers. These case studies were selected to be relevant to one or more of the technical projects, and were used in three distinct ways. Some were used in an observational sense to understand the problems being faced. Others were laboratory case studies to help develop the decision-support tools. Others were comparator case studies which enabled the emerging tools to be tested.

Proposals for ways of overcoming the barriers were developed from consideration of the needs for both strategy development and scheme design, and came from a number of sources. The distinction drawn between strategy development and scheme design was seen as particularly important. Guidance on the first round of Local Transport Plans (DETR, 2000) had already stressed the importance of developing an overall strategy, but had given little guidance on how to do so. It became increasingly clear that many local authorities were unclear as to the meaning of a strategy, and tended to think in terms of a set of separately specified and unconnected policies (Atkins, 2005). In parallel, guidance on strategy development was emerging from related research (Lautso et al, 2004; May et al, 2005a; May, Kelly and Shepherd, 2006). It became clear that local authorities could adopt a strategy-led approach, in which the strategy was defined broadly, and developed as a set of more specific policy instruments, or a scheme related approach, in which individual policy instruments are selected and then packaged in ways which make them more effective. For this reason, the projects dealing with option generation, prediction, appraisal and, to a lesser extent, finance, all developed products designed to support both strategy development and scheme selection.

Initial proposals were presented to the programme's Steering Group, which included representatives of the European Commission, ECMT, Department for Transport, Transport Scotland, Local Government Association and individual local authority partners. Each project also convened its own developmental workshop, to which a wider Reference Group, including other local authorities, consultants, operators and interest

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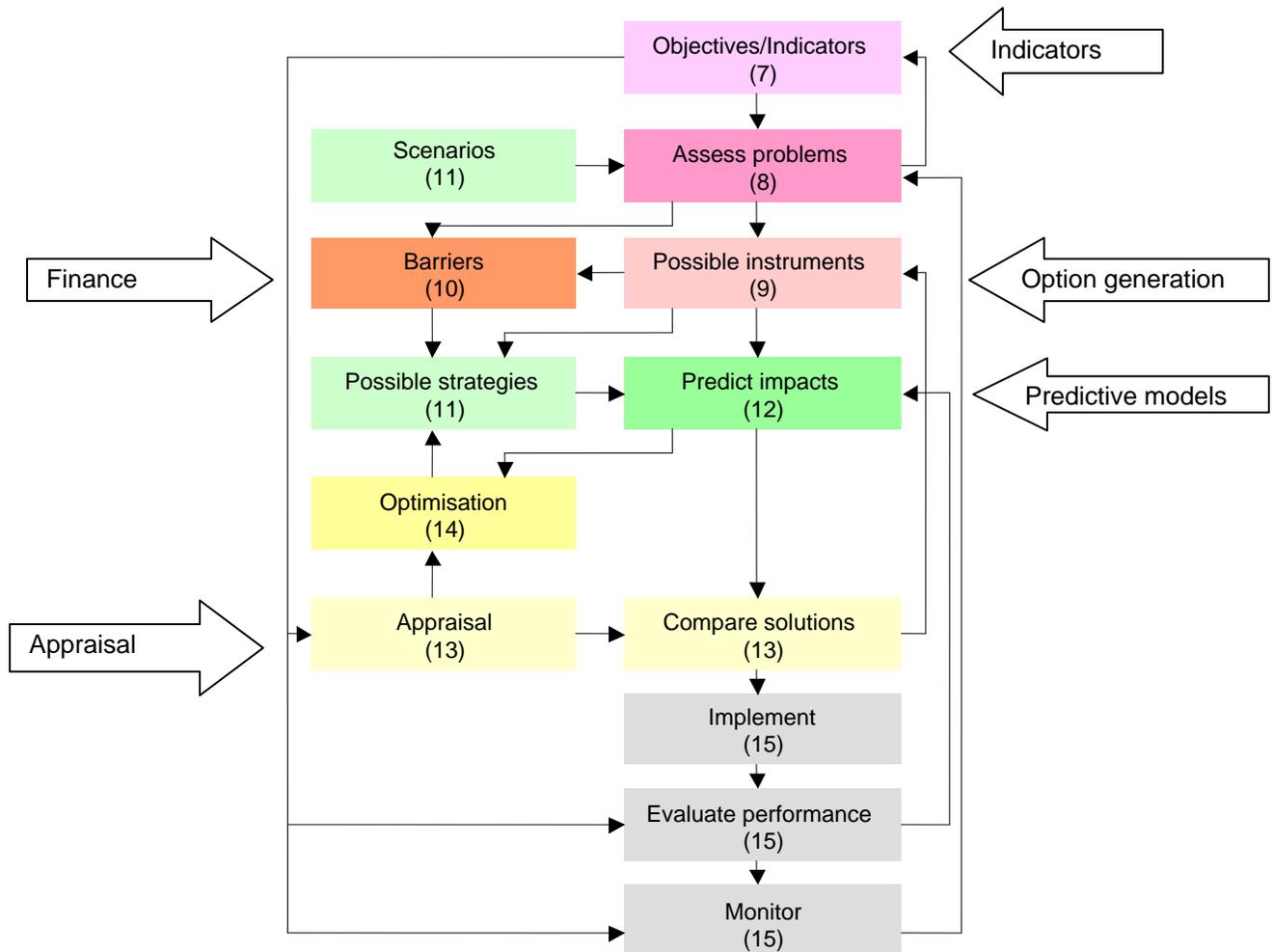
groups were invited. The views expressed led to the shortlisting of a set of 18 products, as listed in Table 1, which indicates which were designed to aid strategy development and which scheme design. Some of these were analytical tools, such as the option generation tools (Jones et al, 2009), the enhanced models (Shepherd et al, 2009) and the new appraisal techniques (Page et al, 2009). Others were guidance documents, including those on monitoring and indicators (Marsden and Snell, 2009), finance (Binsted and Paulley, 2009), the policy guide on appraisal (May, Page and Forrester, 2008) and the guide on partnership working (Forrester, 2009). Further details of each are provided in the summary papers listed above. Figure 1 shows how these products related to different stages in the policy process.

Table 1: The DISTILLATE products

Project	Product for		
	Strategy development	Scheme design	Both
Indicators	<i>Integration of indicators across sectors</i>		<i>Selection and use of indicators</i>
			<i>Specification of new indicators</i>
Option generation	KonSULT option generator	Road space reallocation option generator	
	Accessibility strategy planner	Public realm improvement generator	
Finance	<i>Implications of funding mechanisms</i>		<i>Funding toolkit</i>
			<i>Advice to funding agencies</i>
Predictive models	MARS optimisation tool	Demand management modelling	
	STM public transport and land use model	Public transport modelling	
Appraisal	Distributional impacts of strategies	Distributional impacts of schemes	
	<i>Good practice in appraisal</i>	Small scheme appraisal tool	
Effective collaboration			<i>Good practice in partnership working</i>

Key: standard font: Tools; *Italic font: Guidance*

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Original diagram: Source: May et al (2005b)

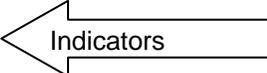
Key:  Indicators The contribution of the technical project on indicators

Figure 1: The role of the DISTILLATE research areas

While each product was designed to be self sufficient, many benefited from the development of products which were applicable earlier in the policy process (Figure 1). The most obvious example was the early development of guidance on indicator selection (Marsden and Snell, 2009), which was used to specify indicators to be incorporated into tools for option generation, prediction and appraisal. Subsequently the strategic prediction model, MARS, was designed to test outputs from the strategic option generator, and the small scheme appraisal method was developed in part to assist in the prioritisation of such strategies (May, Page and Hull, 2009).

## **4 THE APPROACH TO DISSEMINATION OF THE DISTILLATE PRODUCTS**

Each of DISTILLATE's 18 products was presented to the local authority partners, to the Steering Group and, in most cases, to the Reference Group through the programme's workshops. Final presentations were also made in workshops in London and Brussels. In particular, the London workshop attracted representatives of half of the 86 English authorities responsible for producing LTPs, as well as nine of the leading consultancies involved in advising on the LTP process. However, the research team had already obtained evidence from the local authority partners that they were unaware of the tools currently available to them, and that more would need to be done if the DISTILLATE products were to be better used. To this end, an overarching decision-support tool was developed, which enables users to identify products of assistance to them at different stages in the policy process.

The tool distinguishes between strategy and scheme development, reflecting the different concerns expressed earlier in the study. It is based on a flowchart of the policy process similar to that shown in Figure 1, and asks users at each stage to indicate whether they need assistance. Where they do, information on the relevant products from the programme is added to their "shopping basket". At the end of a cycle of questions on strategy development, users are asked whether they need help with more detailed scheme design. Users who have started by considering scheme design are asked, at the end of the process, whether they wish to consider the role of the scheme within a wider strategy. The information provided for each product is a short summary, in standard format, indicating its purpose, method and outputs, and providing further detail on how to access it. Forrester (2009) describes the iterative approach to designing this tool, involving interaction between practitioners and researchers from different disciplines.

Following discussions with the Department for Transport, it was agreed that the most effective means of alerting local authorities to the availability of these products would be through the guidance on Local Transport Plans which the Department was developing

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(DfT, 2009), and through the Local Transport Practitioners' Network (LTPN) website ([www.ltpnetwork.gov.uk](http://www.ltpnetwork.gov.uk)), which had been developed by the Department for Transport, the Local Government Association and the County Surveyors' Society. In parallel, the Department commissioned further developments in two of the products: the KonSULT option generation tool (Kelly et al, 2008) and the MARS sketch planning model (Pfaffenbichler et al, 2008).

Inclusion in the Department's guidance was in principle the easier step. Earlier versions of the guidance on LTPs (DETR, 2000; DfT, 2004) had been very prescriptive as to structure, content and the justification of that content. However, as the earlier report on the LTP process concluded, guidance needed to become less prescriptive, but local authorities needed to "raise their own competence, ability and confidence to pursue innovative, inclusive and locally-relevant transport (policies)" (Atkins, 2007). This recommendation coincided with a move by central government to give greater autonomy to local government. As a result, the guidance for the third round of LTPs is far less prescriptive, and provides freedom for local authorities to select their own plan periods and objectives, as well as the processes by which they develop strategies to meet those objectives. The research team's input to the development of guidance was thus limited to informal advice on the structure of the guidance (reflecting that in Figure 1) and on suggesting references which might be made to individual DISTILLATE products. In practice six references to DISTILLATE products were included in the resulting guidance. Local authorities now have until April 2011 in which to prepare their third LTPs based on this guidance.

Inclusion in the LTPN was achieved more rapidly. The home page now includes a direct link to the overarching decision-support tool (as shown in Figure 2) which, as described above, in turn provides focused links to each of the 18 specific products described in Table 1. There are currently around 1700 registered users and on average 64 separate users per month. Users are both local authorities who do not pay for access and consultants who pay a yearly fee to be members. The website is currently undergoing a redesign to improve its functionality and usability. One of the key successes of the website has been the web events where users join in live forums on specific topics. For example the Department for Transport has held a live forum to answer local authorities' questions on the requirements for the third round of Local Transport Plans.

## Local Transport Decision Making Tool



**DISTILLATE - Design and Implementation Support Tools for Integrated Local Land use, Transport and the Environment** – is an EPSRC-funded project aimed at overcoming the barriers to the effective development and delivery of sustainable urban transport and land use strategies.

**Vision:** To achieve a step change in the development and delivery of sustainable transport and land use strategies.

**Principal Objective:** To develop ways of overcoming the barriers to effective development and delivery of sustainable transport and land use strategies.

Given the current context and future challenges, DISTILLATE aims to contribute to improvements over 20 years, while being relevant to today's needs. Specific objectives of DISTILLATE were to:

- document and review barriers to delivery;
- develop strategy and scheme generation methods;
- establish effective set of indicators, targets;
- support more effective collaboration;
- reduce financial and other implementation barriers;
- enhance predictive models; and
- improve appraisal methods.

DISTILLATE has developed a range of tools and guidance notes aimed at supporting local authority decision-making regarding local transport and land use schemes and strategies. The purpose of this tool is to direct users to the most appropriate DISTILLATE products (tools and/or guidance) that may be of use to them in the development of a scheme or strategy.

### Instructions

1. You will be asked for some general details about the scheme or strategy concerned (e.g., scheme/strategy name)
2. You will then be asked to specify the nature of task (i.e., a scheme level design or strategic policy design)
3. You will then be presented with a series of questions related to your scheme or strategy (yes/no answers). Each subsequent question depends on the answer to the previous question. The question numbers indicate the number of questions per stage. A decision-tree on the left-hand side of the screen indicates your progress through the questions.
4. Finally, the tool will process your answers and produce a printable report containing a list of recommended DISTILLATE products (tools and/or guidance notes) that may assist with your decision-making process.

Click 'Begin Process' to start the decision-making process.

Begin Process



Figure 2: Screen Shot from the Distillate Local Transport Decision Making Tool

It is informative to compare this approach with the findings of the Volvo study. The DISTILLATE products and guidance were all developed through joint research, although commitment to this varied. The tools were developed with a practitioner audience in mind and the heavy emphasis on case-study engagement gave a strong practical flavour to the products and guidance. An overarching decision-support tool was developed

which would allow practitioners to specify their problems and have appropriate products or guidance presented to them, thus avoiding the need to search through the range of options. This in part addresses the problems of information searching.

Whilst the DISTILLATE approach incorporates a number of recommendations of the Volvo research, it provides an interesting test case as to whether the wider barriers of learning from approaches from elsewhere are overcome through this type of approach. The policy learning literature and interviews with practitioners suggest that word of mouth will be an important factor in disseminating the products although this can be reinforced by their inclusion in guidance and good practice notes.

In the following three sections we consider in turn the experience with five of the DISTILLATE products, two of which were the subject of further developments:

- the three guidance documents on indicators (Marsden and Snell, 2009);
- the KonSULT strategy option generation tool (Kelly et al, 2008; May et al, 2010);  
and
- the MARS sketch planning land use-transport interaction model (Pfaffenbichler et al, 2008).

## **5 THE APPLICATION OF GUIDANCE ON INDICATORS**

The research on indicators comprised three research themes each developed with one lead local authority or regional government partner or a group of interested partners, and each producing a guidance document. The research was conducted by four research institutions spread around the country. Each of the three research themes is presented below before some cross-cutting issues are identified.

### **A specification for improved indicators for sustainable transport planning**

At the time of the research proposal the authorities were keen to improve the ways in which they developed and prioritised their sets of transport indicators. This followed from the first round of Local Transport Plans where they had been free to select their own indicators and had ended up with often unmanageably large data requirements some of which were not fulfilled or put to good use (Atkins, 2007). The research therefore adopted a “first principles” approach, by defining sustainability and determining how to specify the concept through a suite of indicators which could be applied to various stages of the decision-making process.

The survey of key barriers to the delivery of transport planning conducted in 2004 reconfirmed the importance of indicators as an issue. However, by the time the research started the policy context had changed. Local authorities had been issued with a set of

mandatory indicators and given guidance on other measures to select. It was suggested by local authority partners that the research should be based on “non-proliferation of indicators” and the scope was therefore reworked to help organise and prioritise the indicators in use given the various formal reporting requirements which existed.

A causal chain analysis was promoted which was worked up with the Merseyside Local Transport Plan team covering the local authorities in the Liverpool conurbation in the North West of England. The Merseyside team were particularly keen to be involved as they had chosen over 100 indicators in the first round LTP and had suffered as a result in being able to adequately describe their programme progress. The causal chain analysis (reported in Marsden and Snell, 2009 and Marsden et al., 2005) was applied by the Merseyside team and used to inform the development of their second LTP submission. Follow up interviews with officers from across the Merseyside LTP Partnership indicated that this mapping process had four main advantages:

1. justifying choices and changes - the indicator map acted as a good visual justification of changes made from LTP1 to LTP2 and ensured that implied linkages between indicators were made explicit;
2. demonstrating choices to the Department for Transport – the team was able more easily to demonstrate the basis for its choices to the national government;
3. helping to understand linkages as the plan progresses – this included reflecting on gaps and overlaps in a more structured manner; and
4. aiding interaction with elected members and other organisations

The guidance produced has since been referenced in the Department for Transport’s guidance for all authorities for LTP3 (DfT, 2009). The successful adoption of the research tool seems to stem from the product meeting a clearly defined and ‘live’ problem. As well as fulfilling a strategic need for the Merseyside LTP partnership it also provided useful independent external validation of the partnership’s thinking, while the Merseyside application in turn demonstrated the value of the tool.

### **Monitoring across different spatial scales**

This case study examined the difficulties which a regional body faced in co-ordinating monitoring across several lower-tier governmental bodies. It was proposed by the Yorkshire and Humber Assembly at the time of the revision to their Regional Spatial Strategy and at a point where a review of current progress with monitoring had been completed by a consultant.

Regional Assemblies in the UK were created in the late 1990s with a view to becoming democratically elected bodies representing coherent regional planning boundaries. They remained however as non-elected bodies and were amalgamated with Regional

Development Agencies in 2009. Their primary functions from a transport perspective were to prepare a Regional Spatial Strategy (RSS) and within this a Regional Transport Strategy. The Assemblies also played an important role in prioritising regional infrastructure projects for funding. The monitoring strategy which formed the basis for the study was to support the RSS. The Assembly struggled to collect data in a consistent manner on many of the indicators from the lower tier authorities. It also had difficulty in getting the authorities to agree on more standardised measures and methods. The research team investigated the main issues through interviews with the regional, unitary, shire and district authorities that typically comprise a Regional Assembly area. Although the focus of the case study was Yorkshire and the Humber the distribution of the research teams involved meant that the investigations covered three different parts of the country.

The research report and guidance (reported in Marsden et al., 2007 and summarised as the guidance document on integration across sectors and spatial scales) does not appear to have had any notable influence on policy or practice even though it has been presented to practitioners and central government. This research was more problematic than the causal chain analysis as the nature of the problem was not entirely clear at the outset of the research. The Regional Assembly that had the problem was not necessarily the actor that needed to change its behaviour to improve co-ordination, the issues being studied were of low priority to the other lower tier authorities, and there was little ownership of the need to change. This was further diluted by the distributed research approach. The research was also beset by issues with the policy framework changing and changes to personnel within the Assembly. Whilst an on-going commitment to the research was provided by all parties, the project ended up being driven by the research team rather than by practitioners interested in affecting change. Whilst it can be argued that the problem of cross-sectoral and spatial integration of indicators has not gone away, the nature of the problem has shifted substantially such that the Product may appear to be dated.

### **Developing new indicators**

The final case study was suggested by one local authority and supported by several others at the initial stage. Several areas of policy were seen to be important but difficult to monitor. For example, economic impacts of transport were seen as particularly difficult to trace. During the course of the research programme, the local authority that proposed the task withdrew from the project. None of the other 'interested' follower authorities wished to pursue the case study. This was coupled with the realisation, noted earlier, that there should be fewer rather than more indicators. An exercise was conducted to demonstrate the principles and practice of selecting new indicators (Marsden and Thanos, 2008) and this has been incorporated into guidance for local authorities for

LTP3 (DfT, 2009) alongside the causal chain analysis (Marsden and Snell, 2009). The research has, however, not been put into practice to the authors' knowledge.

## **6 THE APPLICATION OF THE KONSULT STRATEGIC OPTION GENERATION TOOL**

What evidence there is suggests that option generation is rarely regarded as a key stage in the strategy formulation process. A study by Atkins (2007) for the UK Department for Transport of its Local Transport Plan process suggests that local authorities, in England at least, tend not to innovate, but rather to pursue schemes which have been under consideration for a long period, and to focus on infrastructure projects and management-based improvements to the infrastructure, rather than considering enhancements to public transport or ways of managing demand. The UK Eddington Report (Eddington, 2006) outlines the need succinctly: "Unless a wide range of appropriate options is considered, there is a risk that the best options are overlooked and money could be wasted. A good option generation process is crucial to ensure that the transport interventions that offer the highest returns can be found. The full range of options should look across all modes and include making better use of the existing transport system, including better pricing; investing in assets that increase capacity ....; investment in fixed infrastructure; and combinations of these options."

Consultation in the early stages of DISTILLATE confirmed that option generation was a serious barrier for local authorities, and that there would be benefit in developing tools to support option generation at both the strategy and scheme level (Jones et al, 2009). One of the resulting outputs involved the development of the Knowledgebase on Sustainable Urban Land Use and Transport (KonSULT) as a strategy option generation tool. KonSULT is a web-based knowledgebase designed to provide evidence on the performance of a wide range of transport and land use policy instruments. It can be accessed at [www.konsult.leeds.ac.uk](http://www.konsult.leeds.ac.uk). Updating the website is an ongoing process and to date 46 policy instruments have been populated with information. For each of these, KonSULT provides:

1. a taxonomy and description that defines the instrument, its aims and technological requirements;
2. a first principles assessment that looks at why that instrument should be introduced, considers its anticipated demand and supply impacts, assesses the resulting positive or negative contributions to key policy objectives and problems, and identifies likely winners or losers and barriers to implementation;
3. evidence on performance, illustrated with a series of case studies describing specific interventions, and empirical evidence on their impacts on the same set of objectives and problems examined within the first principles assessment;

4. a summary of the contribution that the instrument is expected to make and the contexts in which it is likely to be most effective and
5. an identified set of complementary instruments that would work well with the selected instrument by helping to overcome barriers or enhance its positive impacts.

Within DISTILLATE, KonSULT was enhanced to provide an option generation tool which allows the user to identify those individual policy instruments which are most relevant to a specified context (Kelly et al, 2008). The user can define his or her responsibilities, area of interest, objectives and strategy. Objectives can be listed directly, or expressed as problems or performance indicators. They and the chosen strategy elements can be prioritised. The scoring system within KonSULT is then used to produce a prioritised list of policy instruments which might meet the user's needs. This ordered list is not presented as a series of recommendations, but rather as a pointer to a wider range of policy instruments. For each policy instrument of interest, the user can interrogate KonSULT to obtain further information (Kelly et al, 2008).

The resulting tool was tested by several DISTILLATE partners as part of their preparation of transport strategies. It was widely welcomed as a facility which suggested options which might not otherwise have been considered. Several users were applying it to prepare bids for funding for strategies which were required to include congestion charging. They, in particular, suggested that it would be helpful to be able to identify the policy instruments which best complemented a pre-specified policy. Subsequently, the Department for Transport sponsored further work to facilitate this, and also to develop the best combinations of up to five policy instruments. These developments are described in a companion paper in this conference (May et al, 2010).

These strategic option generation tools have been referenced in government guidance (DfT, 2009) and included in the Local Transport Planning Network. However, it is difficult as yet to assess their impact on strategy formulation. Both the KonSULT and LTPN websites have facilities for recording numbers of users, but it is not feasible to ascertain whether users are benefiting from the option generation facility or, if so, what impact it has had on the nature of the strategies developed. Ideally the Department for Transport should be able to assess this as part of its informal reviews of progress in the preparation of LTPs. However, the current emphasis on giving local authorities greater autonomy has made the Department reluctant to interrogate them too closely on their progress. As a result it will only be possible to assess any potential contribution once the third round LTPs have been submitted.

## **7 THE APPLICATION OF THE MARS STRATEGIC LAND USE TRANSPORT INTERACTION MODEL**

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A review of modelling needs was conducted in 2005 as part of DISTILLATE (Shepherd et al, 2009). In parallel, the modelling requirements for developing Local Transport Plans were reviewed and reported to the Department for Transport, as summarised in (Shepherd et al, 2006). This study involved a review of Local Transport Plans, follow-up interviews with five local authorities and a final workshop to obtain a wide view of the recommendations. Both the DISTILLATE consultation and the subsequent study highlighted a number of barriers to the use of models in strategy development. Only eleven of the 18 local authorities surveyed used models at all, and most that did used single mode models which were less suitable for understanding the impacts of integrated strategies. Interestingly, there was evidence that those who used models achieved higher scores in the assessment of their LTPs. Local authorities typically did not understand or trust more complex models, felt reliant on consultants to operate them for them, and considered that they were unable to represent several of the newer policy instruments of interest in LTP preparation (Shepherd et al (2006)).]

The reviews generated a number of recommendations, some specific and some more general (Shepherd et al (2006)). These concern use of strategic, sketch plan and network assignment models; the development of a hierarchical approach in which different types of model are used at differing stages in strategy development and for differing time horizons; the need to understand and model the impact of a wider range of policy instruments; and the requirements for modelling integrated packages of instruments. It was this set of recommendations which led to the further development within DISTILLATE, and more recently for the Department for Transport, of the MARS model.

MARS is a strategic land use transport interaction model capable of running a 30 year horizon within less than one minute. It is based on systems dynamics and was developed to identify optimal packages of strategic policy instruments (Pfaffenbichler et al, 2008). It is thus particularly suitable as an interactive model for strategy development and for testing integrated transport and land use packages. The enhancements to MARS which were made in DISTILLATE included enhanced usability, option generation and transparency of approach. These were achieved by implementation of a flight simulator approach and an optimisation facility in the system dynamics platform VENSIM. Additional model enhancements included the inclusion of additional policy instruments such as awareness campaigns, and the improved representation of supply in the off-peak and of over-crowding on public transport. All of these developments were proposed and accepted in the DISTILLATE modelling workshop. They are detailed in Shepherd et al, (2009).

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In order further to enhance the potential of MARS for application in the UK, the Department for Transport subsequently commissioned the following enhancements:

1. a link between MARS and the network simulation and assignment model SATURN;
2. allowing the optimisation procedures to reflect the UK government's newly agreed policy objectives (DfT, 2008); and
3. enabling policy instruments to be applied to corridors.

These enhancements were supported in a workshop with local authority representatives held in March 2009. In particular the representatives were keen to see a fast approach to the generation of policy options capable of being developed with limited resources. They also welcomed the potential to apply the optimisation procedures to generate a set of policies which maximise of a pre-defined objective function or fulfil a given target over the planning period.

The link with SATURN has been automated and this now provides a simple and effective way to generate speed flow relationships per origin-destination pair at the MARS zoning level which are compatible with those generated by SATURN.

The optimisation capabilities have been enhanced to include a Multi-Criteria Analysis based on the government's performance indicators (DfT, 2008) and to provide an overview of which indicators a particular policy combination can affect (Figure 3).

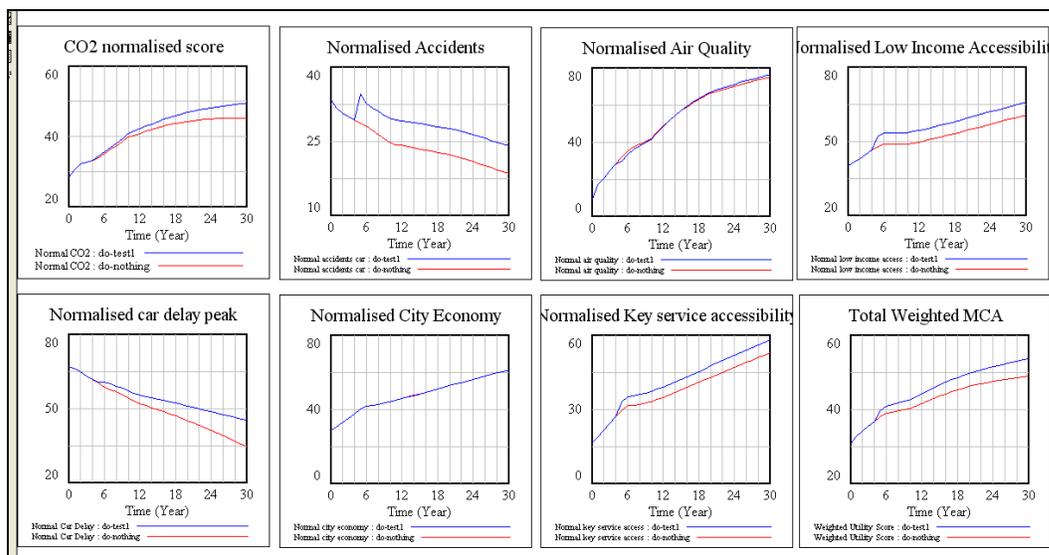


Figure 3: Normalised Values of MARS indicators for a test strategy

Finally the interface has been developed so that corridor based policies can be easily implemented within the model. Details of these improvements are contained in our companion paper presented at this conference (Shepherd et al, 2010). It is hoped that with these relevant enhancements MARS will be accepted as a useful tool by local authorities when developing their current round of Local Transport Plans.

However, despite aggressive marketing and bids for development of models with consultants as partners in the UK and Ireland, MARS has not yet been adopted for this purpose. Indeed, in most cases local authorities have decided to proceed without using a model, apparently because of increasingly severe budget restrictions. However some models have been developed as part of research projects with other academic organisations and recent additions include models in Brazil, Washington DC (USA), Trondheim (Norway), Gateshead (UK) and Bari (Italy).

## **8 DISCUSSION**

In this paper we have highlighted the need for decision-support tools to support the development of sustainable urban transport strategies, and have described the approach adopted in the UK DISTILLATE programme to prioritising and developing such tools. The approach adopted, using action research with a group of 16 local authority partners, should have ensured that the products of the programme were of direct benefit to local authorities, and would be readily adopted. The encouragement for such adoption was enhanced by the requirement, by government, that local authorities develop a third round of Local Transport Plans.

However, rather than simply assuming that these products would be put to use, the research team adopted a dissemination strategy, which included focused workshops, targeted references in the government's guidance on LTP preparation (DfT, 2009), and an overarching tool within the government's Local Transport Planning Network website ([www.ltpnetwork.gov.uk](http://www.ltpnetwork.gov.uk)), which enables users to identify the tools which are likely to be of particular use to them. In some cases, the Department for Transport also financed further developments to meet requirements identified in initial testing by practitioners.

Despite these focused efforts, the evidence for take-up of the research programme's products is partial, and in many ways disappointing. In this paper we illustrate this with three examples, involving five products. Of the three guidance documents on indicators, the first was put to good use early in the programme as input to the second round of LTPs. It was subsequently applied to the development of further guidance. The other two do not appear to have been applied, although this will need to be checked once the third round LTPs have been submitted. The strategic option generation tool, based on

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KonSULT, was well received by initial users during the research programme, but it has been difficult to obtain evidence that it is being used to enhance strategy development in the third round LTPs. Once again, this will need to be checked once they have been submitted. Evidence on the take-up of the strategic land use transport interaction model, MARS, is immediately available, since users need to purchase licences for its use. To date, no local authority has done so, though several new research applications have been developed.

It appears that the development of practitioner oriented research products still leaves significant adoption barriers. The Volvo research suggests that even knowledge about new options might not be sufficient to encourage adoption. Most effective in promoting the uptake of ideas were personal networks and practical experience in their application. Here, perhaps, the programme suffered from insufficient use of the case study users as ‘salesmen’ for the products and from the difficulties in staff continuity and time commitment. It could also be that the problems were framed in different ways by other authorities and that they would see the need for different products. Diffusion theory suggests that it is not necessarily the earliest pioneer adopters that will stimulate widespread uptake as they may be seen to be ‘different’ (Rogers, 2003). Finally, the period between the end of the programme and our assessment of uptake is relatively brief. Should a few authorities adopt these ideas as part of LTP3, their application may then be more rapidly spread by word of mouth. It will be helpful to monitor the situation when the new LTPs come into operation early in 2011.

In Section 2 we identified four criteria from Brownson et al. (2006) which are useful in evaluating the extent to which the case studies likely to suffer from the traditional problems of distance between research and practice. The five products are classified in Table 2, with an assessment of whether each of these barriers was in place or not.

Table 2: Potential challenges to the take-up of products

Product	Research Culture Aligned		Timing Good		Findings Clear		Time and Continuity of staff		Products applied
	Yes	No	Yes	No	Yes	No	Yes	No	
Improved Indicators	✓		✓		✓		✓		✓
Across Spatial Scales	✓			✓		✓		✓	✗
New indicators	✓			✓	✓			✓	✗
Option Generator	✓		✓		✓			✓	?
MARS Model	✓		✓		✓			✓	✗

Although a small sample, it is notable that the only case study in which no barriers were identified is the only to have been clearly applied. For the others, timing and continuity of staff were the principal barriers.

As a result of the requirements of the research funding body, the time lag between identification of priority needs and production of the final products was five years, and over six years for those which were subsequently further enhanced. This caused particular problems for two of the products relating to indicators where the requirements of central government changed dramatically over the course of the research. Around half of the local authority contacts changed during the course of the programme which led to a loss of ownership and sometimes momentum in the research applications.

## **9 CONCLUSIONS AND RECOMMENDATIONS**

In this paper, we have summarised the process adopted for disseminating a series of decision-support tools for urban transport policy, and have assessed our experience of dissemination against the literature on policy transfer. Of the five products considered in detail, only one has been effectively applied in practice, and one other is showing early evidence of such application. For the others, timing and continuity of staff were the principal barriers.

For three of the products the extent of application is as yet uncertain. It is difficult to ascertain such use without resorting to detailed surveys, unless the tools need to be purchased, or can only be accessed via the web. With hindsight, it would have been sensible to include a specific check in KonSULT of the use of the option generator, rather than simply a general check on the use of KonSULT. The guidance documents on indicators were intentionally made available through a number of channels, thus rendering such checks infeasible.

Even if products are known to be used, it is still difficult to assess the benefits gained. The only robust way in which this could be done would be to assess what the strategy might have looked like, and how it would have performed, without the use of the products. At a more general level, it is possible to ask users for their assessment, although such answers may well not be wholly objective. Provided that take-up is extensive, it is also possible to compare the performance of strategies developed using the products with those developed without. Such an approach was adopted in the review of the LTP process (Atkins, 2007), and also in our earlier work on the use of predictive models (Shepherd et al, 2006). However, it seems unlikely that take-up for many of these products will be sufficient to permit such a comparative assessment of third round LTPs.

In conclusion, it is clear that improved decision-support tools are needed to enhance the process of developing urban transport strategies. However, it remains uncertain whether such tools will be put to good use, or what their impacts will be. It is hoped that a sample survey of local authorities can be conducted once the third round of LTPs has been submitted. In the meantime, it appears that the following steps should be taken to ensure that future developments in this area are fit for purpose, and effectively exploited:

1. the elapsed time between specification of needs and completion of development should be substantially reduced (in the case of DISTILLATE, this period was largely determined by the research funding body);
2. more resources need to be devoted to maintaining contact with potential local authority users, and in particular to ensuring that commitment is maintained when staff change;
3. the central government body responsible for seeking urban transport strategies should fully endorse the need for the decision-support tools, and should be committed to a strategy for encouraging their use;
4. where local authorities need to purchase the resulting products, there needs to be a clear understanding from the outset that they will have the resources to do so;
5. greater use should be made, in the dissemination of products, of the practitioners involved in generating them;
6. efforts should be made to involve consultants more directly in the dissemination of products; it appears, contrary to the findings of the Volvo study, that they are playing an increasingly important role in developing local authorities' strategies.

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