

DISTILLATE

Project G: Enhanced Appraisal Tools

Deliverable G1: Background

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1 Introduction

Project G is exploring the issue of appraisal as a barrier to the implementation of sustainable land use and transport policies and has the aim of exploring possible improvements in appraisal methods to overcome these barriers.

This document covers initial work on the project looking at the process of appraisal, primarily as it is carried out by UK local authorities to help decision making in transport. Section 2 gives a background to appraisal and how it is used in decision making. Section 3 explores some of the issues raised in Section 2 and looks at the barriers identified by local authorities and the research issues raised by these barriers. It identifies three possible products that might help local authorities address these barriers plus identifying further work on the issues raised which will form a useful product in itself.. Sections 4 to 6 cover initial work done to develop the first three products identified in Section 3, that is the development of an “initial/outline” appraisal method, appraisal methods for small schemes and attitudinal measures and ways of taking distributional issues into account in appraisal. Note that some of these products are much more well advanced than others and therefore these sections vary considerably in length and detail. Section 7 explores the political and practical context, which is felt to be important to understanding how local authorities use appraisal. The concluding section (Section 8) gives details of the products that will be developed by project G, the three products already identified and the fourth product – a review of the issues covered in Section 3, informed by the analysis of the political and practical considerations explored in Section 7.

2 Context and Background

2.1 Introduction

This Section aims to look at the background of appraisal and how it is used in decision making. The first part gives an overview of appraisal, defining the key concepts and although our concern is based mainly on the UK process, this part also considers the common practice in other European countries. The role which appraisal plays in the final decision is a key issue, and in particular whether it is used in any sense to make the decision or simply to assist in decision making. This Section considers central government guidance and the New Approach to Appraisal (NATA) framework, which is common practice in UK transport appraisal. The guidelines for local authorities to conduct appraisal are outlined. Multi criteria analysis is also considered as it has been argued to be either an alternative way of undertaking appraisal or a complementary tool.

2.2 The purpose of appraisal

Appraisal is described as an important process because investment resources are limited and there are many potential opportunities for the use of resources. The Green Book (HM Treasury, 2003) defines the role of appraisal as ‘providing an assessment of whether a proposal is worthwhile, and clearly communicates conclusions and recommendations.’ Appraisal is a comparative tool and involves comparing alternative states of the world; do-nothing or do-minimum in the simplest case with do-something. As choices have to be made, transport appraisal can be thought of as comparing ‘value for money’ (VfM) though, where impacts are not monetised, a judgement has to be taken on the relative value of different impacts. Much of the literature suggests that appraisal should be regarded as an aid to making decisions and not a decision maker. However, in practice the distinction can be a difficult one to make and this is discussed in more length in Section 3.

CfIT (2004) state that appraisal is a key component in the transport planning process for government. Appraisal allows an objective review of investment options within the limits of government resources. The Green Book (HM Treasury, 2003) forms the basis of the government’s appraisal process. Department for Transport (DfT) guidance is provided within the New Approach To Appraisal (NATA) and Guidance on Multi-Modal Studies (GOMMS), which is now brought together into the Transport Analysis Guidance (TAG) (DfT, 2004a).

Grant-Muller et al (2001) state that the transport appraisal process is carried out differently in different countries, but there are many similarities that support common guidelines. Appraisal is not used for making a final decision in most countries. It is used for prioritising projects, making recommendations, and evaluating alternative options for the same project. Cultural and political factors as well as other priorities are also considered to reach the final decision on whether a project should be approved, however the point at which these factors are taken into account varies across countries.

Bristow and Nellthorp (2000) state that in the European Union, appraisal is generally seen as a tool to assist the process of planning transport systems and provides relevant information to decision makers. As pointed out previously, they state that appraisal does not actually ‘make’ decisions. Decisions supported by appraisal include:

- choosing between alternative solutions to a common problem;
- deciding whether or not a particular project represents good value for money;
- prioritising projects within a programme; and
- choosing the optimal times at which to undertake investment.

The wider process of transport analysis (Current UK practice is covered in detail in DfT (2004a), see Figure 1 below) includes a number of processes and appraisal can be defined as comprising some or all of:

- Searching: defining projects and project options for testing
- Modelling and Forecasting: Representing the existing network, traffic flows, prices and journey times into a calibrated model, which can be used to forecast future flows, times, costs etc
- Evaluation: conversion of the forecast impacts into benefits, revenues and costs
- Decision: adding up the stream of benefits and costs and assessing value for money

The general aim of appraisal is regarded as to be improvement of the quality of choices made between alternative investments and alternative policies. However, exactly how appraisal should do this can vary. Should appraisal be used to explore the consequences of different decisions in a process where the weighting of different impacts can be changed by decision makers, or should it be a prescriptive technical process of applying weights which have been objectively derived and previously agreed? In the former case there is an argument for saying that it can be used to justify any decision, in the latter case, the risk is that the outcome of the process does not support the policy that the decision maker wants to pursue. These issues are covered in more detail in Section 3. These issues are also clearly important as the context in which appraisal is used in practice, as such they are also covered in more detail in Section 7.

Mackie and Nellthorp (2001) identify three factors which influence whether a project goes ahead:

- Public opinion: what do people think of it? This influence has gained more power in the UK in recent years. For example, public opposition to road user charging remains a key barrier to implementation.
- Technical appraisal: this is economic appraisal and can include a cost benefit analysis (CBA); it also includes environmental and wider impacts, and can show the incidence of effects on specific groups.
- Political context: how well does the project fit into the policy agenda and political process? Does it relate to the overall goals of the administration? How strong is the opposition?

The decision taker must consider these three factors which are hurdles which the project has to cross. The project may not pass all the hurdles and may then need to be redesigned and make further attempts at passing the hurdles; therefore there is an iterative process to achieve the end result. Mackie and Nellthorp (2001) state that “crucial to good quality decision making is an ability to understand, incorporate and balance off the social, economic and political considerations.”

There are two main levels of appraisal of transport policies and projects in England. Transport policies and programmes such as Local Transport Plans are developed based on DfT guidance, including monitoring and evaluation criteria (DfT, 2004b). Those schemes funded under the Integrated Transport Block Grant are not required to go through a formal appraisal process but guidance suggests some form of appraisal is advisable. Major schemes (individual projects costing over £5m) are required to go through an individual project appraisal based on NATA.

Figure 1 illustrates an overview of the DfT transport analysis process. Note that appraisal is explicitly mentioned in boxes 6, 7 and 9. Boxes 6 and 7 can be seen as the use of frameworks and tools to support the actual option testing and appraisal process which takes place in box 9. Monitoring and evaluation (box 15) obviously has links with the appraisal procedures as the evaluation might follow a similar process as the original appraisal, in order to compare predicted with actual outcome.

2.3 Central government - The Green Book: Appraisal and Evaluation in Central Government

The Treasury Green Book (HM Treasury, 2003) is a best practice guide to carrying out appraisal and evaluation of policies and capital projects. It is used by all central government departments and executive agencies, and aims to make the appraisal process throughout government more consistent and transparent.

The guidance states that appraisal is ‘designed to promote efficient policy development and resource allocation across government.’ This is via informing decision making, and by improving the alignment of departmental and agency policies, programmes and projects with government priorities and the expectations of the public.

The Green Book states that appraisal and evaluation form stages of a broad policy cycle consisting of stages: Rationale, Objectives, Appraisal, Monitoring, Evaluation and Feedback. It starts with identifying the rationale for intervention, proceeding through the development of the outcomes to be achieved and appraisal of a range of solutions to implementation, monitoring and evaluation. The DfT Transport Analysis Guidance follows this outline (see Figure 1 from DfT (2004a)), NATA is now incorporated into this wider Transport Analysis Guidance known as WebTAG.

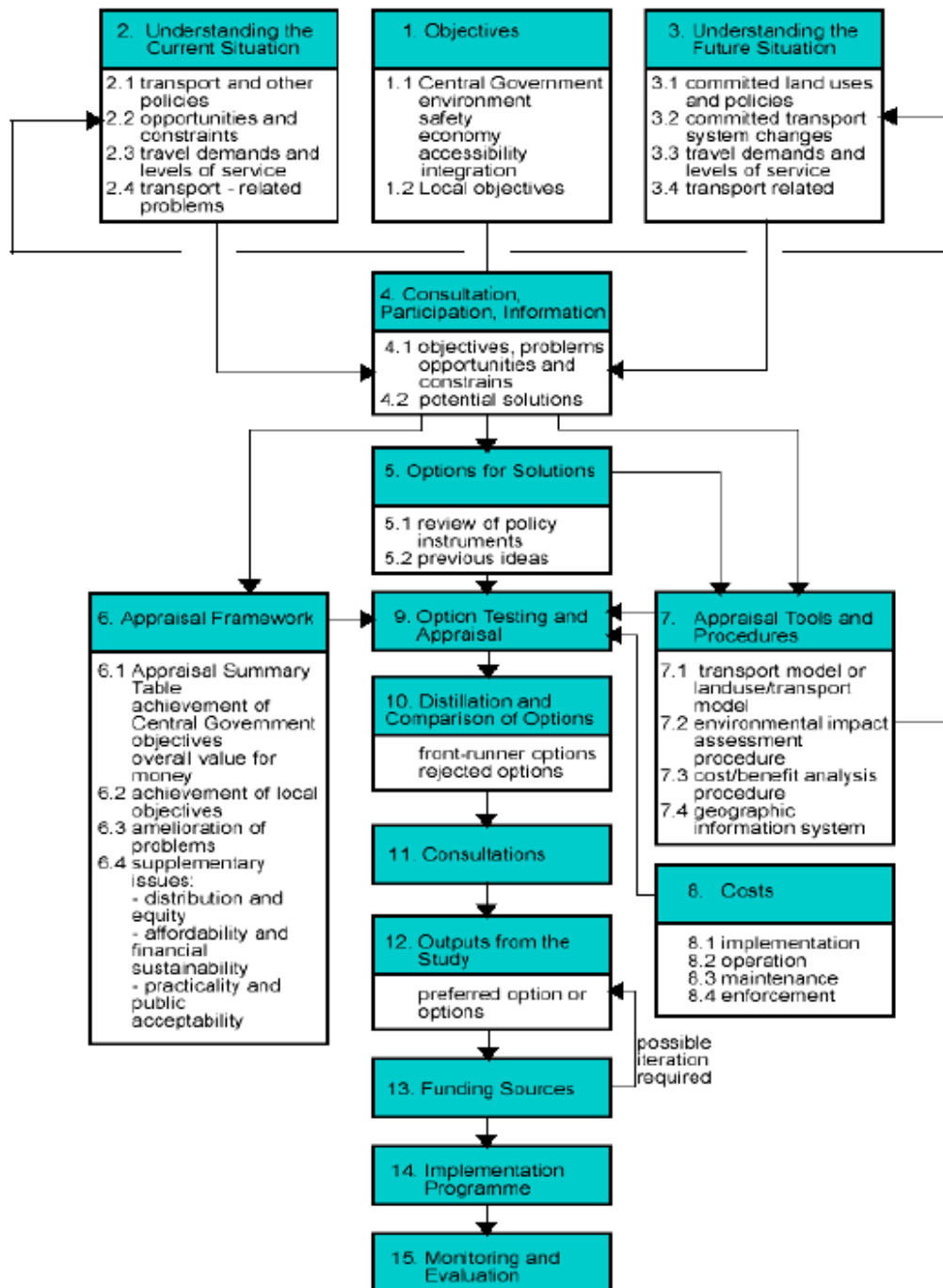


Figure 1 Overview of the transport analysis process (source: WebTAG Unit 2.5, DfT, 2004a)

The main features of the Green Book process are:

1. An overview should be conducted to identify the rationale for intervention, carrying out research on the issues involved and scoping the problem to be addressed.
2. Objectives need to be set, broadly in terms of outcomes desired, and relevant outputs and targets specified to make progress.
3. Options should be identified and developed to understand the range of actions that could be taken in order to deliver the proposal.

4. These options should then be appraised in order to develop an optimum solution. Cost Benefit Analysis (CBA) is the recommended process, by which costs and benefits are valued in monetary terms. These values may need to be adjusted for distributional impacts, differential tax treatment and relative price changes. There is also the need to value risks and readdress optimism bias through making specific adjustments.
5. The best option should be selected and refined into an implementable, affordable solution, which also considers the non-monetised factors.
6. The implemented proposal should be evaluated in terms of the objectives set, after a specified time. (HM Treasury, 2003)

The need to take account of the wider social costs and benefits of proposals, and the need to ensure the proper use of public resources is strongly emphasised by the Green Book. It recognises the need to take account of all the economic, social, environmental and financial impacts of an option. This should be achieved by: identifying other possible approaches which may achieve similar results, attributing monetary values to all impacts of proposals where possible, and performing an assessment of the costs and benefits for relevant options.

Cost-benefit analysis (CBA) is a framework which seeks to assess the costs and benefits of projects and policies, whoever they accrue to; it uses monetary values to express measured impacts as a total money amount based on consumer's preferences; and seeks to avoid double counting of the benefits in different economic markets. CBA is important where no direct revenue exists or revenue does not reflect benefits, (e.g. an untolled road) and external costs and benefits exist (e.g. the congestion/environmental benefits of public transport). The Green Book (HM Treasury, 2003) defines CBA as "analysis which quantifies in monetary terms as many of the costs and benefits of a proposal as feasible, including items for which the market does not provide a satisfactory measure of economic value."

2.4 The New Approach To Appraisal (NATA)

The New Approach To Appraisal (NATA) was introduced in 1998 in order to provide assistance in choosing between different options for solving the same problem, prioritising between proposals and assessing value for money. It has evolved since its introduction and has been incorporated into WebTAG (DfT, 2004a). The appraisal procedures described in WebTAG are now the basis for:

- Appraisal of multi-modal studies
- Appraisal of Highway Agency road schemes and major road and public transport schemes developed as part of Local Transport Plans
- The project appraisal framework for seaports
- The appraisal framework used during the development of the government's airports strategy.

Note, however, that the WebTAG procedures do not have to be used for the analysis of LTPs and the smaller schemes which are proposed for funding in the LTP under from Integrated Transport Block Grant (see Section 2.6.1 below).

NATA represented an extension of the traditional CBA approach to assessing the total costs and benefits from a project. CBA is based around monetised costs and benefits, especially quantifiable user benefits, implementation and operating costs, and external environmental and safety costs (Marsden et al., 2005). NATA includes identifying and assessing problems and options, based on the government's overarching five objectives for transport which are the basis for the appraisal process. In this process, it also includes but expands on the CBA approach.

The five objectives are:

- **Environment:** involves reducing the direct and indirect impacts of transport facilities on the environment of both users and non-users. Sub-objectives include: to reduce noise, to improve local air quality, to reduce greenhouse gases, to protect and enhance the landscape and townscape, to protect the heritage of historic resources, to support biodiversity, to protect the water environment, to encourage physical fitness and to improve journey ambience.
- **Safety:** concerned with reducing loss of life, injuries and damage to properties due to transport incidents and crime. Therefore sub-objectives include: to reduce accidents and to improve security.
- **Economy:** concerned with supporting sustainable economic activity and getting good value for money. Sub-objectives include: to get good value for money in relation to impacts on public accounts, to improve transport economic efficiency for business users and transport providers, to improve transport economic efficiency for consumer users, to improve reliability, and to provide beneficial wider economic impacts.
- **Accessibility:** concerned with the ability with which people can reach different locations and facilities by different modes. Sub-objectives include: to improve access to the transport system, to increase option values and to reduce severance.
- **Integration:** tries to ensure that all decisions are taken in the context of the government's integrated transport policy. Sub-objectives include: to improve transport interchange, to integrate transport policy with land use policy and with other government policies.

While these are referred to in the guidance (DfT, 2004a) as “objectives” and are regarded as the national objectives of transport policy, NATA is an appraisal process and therefore should consider *all* impacts of a proposal without prioritising any particular impacts as objectives. How the above objectives should be treated is therefore unclear and also what should be done if they do not reflect the local objectives of transport policy. It is perhaps easier to consider the above “objectives” as criteria which allow all the impacts to be identified without overlaps or gaps. Even then, the issue of what happens when a local authority wants to pursue a scheme which fits well with their transport local policy (the development of which may have been informed by national guidance) but fails to “perform” well when taken through NATA is unresolved. This issue is discussed in more detail in Section 3.

The NATA appraisal framework is made up of:

- Appraisal Summary Table (AST) which displays the degree to which the five government objectives (environment, safety, economy, accessibility and integration) would be achieved (step 6.1 in Figure 1),
- Achievement of regional and local objectives (step 6.2),
- An assessment of the effectiveness of the options in addressing problems (step 6.3), and
- Supporting analyses of distribution and equity, affordability and financial sustainability, and practicality and public acceptability (step 6.4).

DfT argues that these four parts together provide the decision-maker with the information needed to reach a considered judgement on the worth of a project.

The information in the AST is based on the results obtained from established techniques to assess the environmental, economic and social consequences of options. An example AST is illustrated in Figure 2, the AST and the approach to filling it in is periodically revised in line with what is felt to be best practice and some of the entries may be informed by other analyses (eg environmental impact assessment (EIA)). The AST refers to a single proposal compared with a “do minimum” or “do nothing” alternative. In cases where different options need to be tested, each option requires a separate AST comparing it with the “do minimum”.

Option		Description	Problems	Present Value of Costs to Public
OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE ASSESSMENT	ASSESSMENT
ENVIRONMENT	Noise			net population win / lose
	Local Air Quality			Concs wtd for exposure
	Greenhouse Gases			tonnes of CO ₂
	Landscape			Score
	Townscape			Score
	Heritage of Historic Resources			Score
	Biodiversity			Score
	Water Environment			Score
	Physical Fitness			Score
	Journey Ambience			Score
SAFETY	Accidents			PfVB Em
	Security			Score
ECONOMY	Public Accounts		Central Govt P/V, Local Govt P/V	P/V Em
	Transport Economic Efficiency: Business Users & Transport Providers		Users P/V, Transport Providers P/V, Other P/V	P/V Em
	Transport Economic Efficiency: Consumers		Users P/V	P/V Em
	Reliability			Score
	Wider Economic Impacts			Score
ACCESSIBILITY	Option values			PfVB Em
	Severance			Score
	Access to the Transport System			Score
INTEGRATION	Transport Interchange			Score
	Land-Use Policy			Score
	Other Government Policies			Score

Figure 2 Appraisal Summary Table (Source: WebTAG Unit 2.5, DfT, 2004a)

The AST is meant to incorporate all the impacts of a proposal (both monetised and non-monetised, qualitative and quantitative) and it is therefore felt to include all impacts that the decision maker needs to take into account. The decision maker is asked to consider the “overall net value” of the proposal and this will inevitably incorporate an element of judgement as not all the impacts are expressed in the same way or in the same units.

CfIT (2004) state that the NATA process is sound and has wider applicability than just transport appraisal. In order to achieve consistency of decision-making, NATA

should be applied more widely across government, particularly in areas that interact directly with transport policy.

As might be expected for a technique which has a significant influence over government investment decisions, there is debate over whether the NATA framework is comprehensive, that is, does it include all the impacts of a scheme. An example of this is the recent debate over the wider economic benefits of schemes and the beneficial effects of agglomeration – an observed relationship between densification (which can be facilitated by transport projects) and productivity, this is felt to be additional to the benefits of a scheme assessed under the economy objective in NATA. These are highly technical areas and are outside the remit of Project G, but they do have an effect on the development of appraisal methodologies.

2.5 MCA and logical frameworks

Multi-criteria analysis (MCA) is a technique (or collection of techniques) for assessing decisions where the impacts are not expressed in the same units. NATA can be considered as a hybrid MCA technique in that some of the impacts are converted to common units (travel time savings, accident costs and some environmental impacts are converted to money values) while others are not (eg landscape effects). Logical frameworks and multi-criteria analysis (MCA) can be considered as alternatives to cost-benefit analysis (CBA), though CBA can also be considered as a particular type of MCA which simply uses monetary valuations as the weights for the impacts. Logical frameworks require the decision maker to use judgement over the information provided in reaching a decision. MCA can be objectives led, like the logical framework approach, but goes further as it requires a weight for each impact and uses these weights to produce a total weighted score for the project. Projects can then be ranked. In Europe, many countries have a historical tradition of using MCA in the appraisal process, whilst others use some form of MCA procedure in the overall appraisal framework.

For unvalued costs and benefits, the most common technique noted by the Green Book is weighting and scoring. This can be carried out using an MCA technique, as long as weights can be supplied. The Green Book acknowledges that the weights used in MCA cannot be decided by experts, but must take account of the views of stakeholders and decision takers and are therefore subjective.

WebTAG (2.7.1) (DfT, 2004a) describes NATA as a form of MCA. The impacts of an option are brought together in the AST and supporting analyses. The impacts are presented in monetary and quantitative terms, but no other weighting information is provided. Decision takers must apply their judgement, taking account of the views of stakeholders determined through participation, to weigh up the impacts to reach an assessment of the overall value for money of the proposal.

Grant-Muller et al (2001) suggest that MCA is an alternative approach to appraisal, which is objectives led with the goal of maximising with respect to a set of socially based objectives rather than market values. A simple MCA approach is where groups of impacts are defined based on the objectives of decision makers, which capture the performance level of each alternative project in achieving the set objectives. The achievement of objectives can be assessed in many ways, such as a measured

quantity, qualitative assessment or rating. These impacts can be transformed onto a scale (0-100) giving a score for each impact for each project. The overall performance can be estimated by generating an overall project score. This is calculated by multiplying each impact score by a relative weight for that impact and then summing over all impacts. The relative weight reflects the importance of an impact compared to other impacts.

As with other forms of appraisal, there are problems with the MCA approach in terms of: identifying and defining the impacts to be included; specifying the measurement method and how each impact will be assigned a score; issues about the use of weights and how they are obtained; and variations in how the scores and weights are combined to give an overall project score.

2.6 Local authority approaches

2.6.1 Local Transport Plans and the integrated transport block grant

The Government provided guidance to local authorities on the approaches and methods they should adopt when drawing up their second round Local Transport Plans (LTPs) (See DfT, 2004b). LTPs are five year transport strategy documents required for all areas of England outside London.

LTPs should be in line with the overall transport strategy as set out in the Transport White Paper (DfT, 2004c). LTPs are expected to develop policies and proposals to address “shared priorities” (objectives). They are also expected to set transport in a wider context, set locally relevant “challenging but realistic” targets for outcome indicators, identify the best value for money solutions to deliver the targets and set trajectories for achieving key targets.

LTP authorities are required to report on a number of mandatory indicators and are also expected to develop their own local indicators for impacts which are important to them. Some of the indicators are consistent with Best Value Performance Indicators (BVPIs) and some are specific to LTPs. The mandatory indicators (taken from DfT (2004b) are:

- Indicators of road condition (BVPI96, 97a, 97b)
- Total killed and seriously injured (KSI), child KSI and slight casualty rate (BVPI99 (x), (y) and (z))
- Public transport patronage (BVPI102)
- Bus satisfaction (BVPI104)
- Footway condition (BVPI87)
- Accessibility (LTP1)
- Change in area wide road traffic mileage (LTP2)
- Cycling trips (annualised index) (LTP3)
- Mode share of journeys to school (LTP4)
- A bus punctuality indicator (LTP5)
- Changes in peak period traffic flows to urban centres (LTP6) – only required for LAs with urban centres with total populations of more than 100,000
- Congestion (vehicle delay) (LTP7) – only required for LAs with urban centres with total populations of more than 250,000

- An air quality target (LTP8) – only required for LAs which have an air quality management area

[subsequently, updated guidance suggested that BVPI97a and LTP4 were no longer required, but there doesn't appear to be any record of this on the DfT's website at the current time (March 2007)]

For smaller schemes (gross cost less than £5m) detailed preparation of a business case and full appraisal is not required. Local authorities are free to use their own procedures for assessing these smaller schemes though the guidance does suggest that local authorities should identify “benefits and costs of LTP proposals in LTPs – including all non-monetised benefits (such as environmental impacts) specified by the NATA framework and indicating their likely magnitude” (DfT, 2004b). The funding for these smaller schemes will be through the integrated transport block grant. For major schemes (gross cost greater than £5m) a detailed business case (including a full appraisal) has to be developed. Such schemes clearly have to fit within the overall LTP policy, but, if accepted, they are funded separately by the DfT (see Section 2.6.2 below).

Smaller schemes are usually identified in the LTP (except for very small schemes, which may be pooled under more general headings such as “improvements to the cycle route network”), but they are obviously not subject to the same degree of analysis as major schemes. Local authorities are likely to pay particular attention to whether they can help them achieve improvement in the mandatory or local indicators they have set themselves. As such the assessment of small schemes is less likely to be overall value for money (taking into account the full range of impacts in NATA) and more likely to be “best value-for-money solutions to deliver those targets” (DfT, 2004b).

It would be wrong to see LTPs as bids for funding in the same way as major scheme proposals. The guidance makes it clear that local authorities should see an LTP as a “prioritised programme to deliver the best possible value for the indicative capital funding levels” (DfT, 2004b). The Department has published provisional planning guidelines for the integrated transport bloc for authorities.

2.6.2 Major schemes

The current procedures which local authorities are expected to follow in bidding for DfT funding for major transport capital schemes are covered in DfT (2005). This includes the preparation of a business case, of which “Appraisal and value for money” (in accordance with the guidance provided at WebTAG) forms an important part. The guidance also suggests that “...any major scheme must form an integral part of an authority's LTP, and reflect the principles of LTP development” which clearly include the achievement of target levels of the indicators identified in the LTP (both mandatory and locally determined). However, value for money (VfM), as calculated from the appraisal process, has an overarching significance as the Department will not fund projects with a poor VfM, is unlikely to fund projects with a low or medium VfM, but will fund most projects with a high VfM (DfT, 2004d).

Information on risk and optimism bias are now required by the DfT and uplifts are applied to costs based on estimates of risk and levels of acceptable overruns (DfT, 2004e)

More recently, the Government has decided that most major transport schemes (including all major transport schemes identified in LTPs) will be funded through regional funding allocations and the process of prioritising schemes for funding has been devolved to the Regions. Different regions have taken different approaches to this task (DfT, 2006). The regional prioritisation process is now used as a “filter” – regional prioritisation is a prerequisite for consideration of a business case by the Department (House of Commons, 2007).

The appraisal process, including the preparation of a scheme to a stage where it can be appraised and a business case prepared can be costly for a local authority. The House of Commons Transport Committee estimated that “it can cost between five and fifteen per cent of total scheme costs just to get a scheme to a stage where appraisal can take place”, though this figure was disputed by the Department (House of Commons, 2007). The requirements of appraisal also mean that a scheme tends to be well advanced before it is ready to be appraised, meaning that it is more difficult to change the design or a proposal or to abandon it entirely without embarrassment.

2.7 Conclusion

Appraisal is a process for helping to make decisions on investment by taking into account all the impacts of a proposal. The different impacts can be considered in various ways and some impacts will be easier to express in some forms than others.

Current UK practice for major transport projects (as set out in WebTAG (DfT, 2004a)) is to quantify and monetise some impacts (eg travel time savings, accident costs), quantify but not monetise others and simply apply qualitative scoring where this is not possible. Practice changes as more research is done into the potential for representing impacts in different ways.

For small schemes funded by the integrated transport block grant, appraisal requirements are much less onerous than for major schemes (gross cost >£5M). LTPs incorporate a number of indicators and associated targets. In the absence of more prescriptive guidance on how to assess small schemes, local authorities are liable to make decisions about these based on their contribution to improvements in the indicators. Major schemes are appraised using the NATA criteria, which includes all impacts (as far as is possible) and value for money, assessed using the subset of these impacts which are monetised, has an overarching importance in bidding for capital funds to support such projects.

3 Appraisal issues

3.1 Introduction

This section covers the relevant barriers identified by the local authorities as part of DISTILLATE, derives research issues from the barriers and discusses these issues, introducing the particular areas of study covered in subsequent sections.

3.2 Barriers and issues

The motivation for project G in DISTILLATE came from local authority concerns about appraisal and their perception of appraisal as a barrier to the development of sustainable transport and land use policies. Further work carried out by DISTILLATE Project A (Hull and Tricker, (2005), Hull et al., (2006)) and discussions with local authorities associated with the work on project G, has suggested that the barriers can broadly be summarised as:

1. Some impacts are not well assessed in current appraisal mechanisms (e.g. impacts on public health).
2. There is a lack of knowledge of the impacts of certain policy instruments.
3. The appraisal methods appropriate for the assessment of certain instruments are not well developed. Many of these are new policy instruments (e.g. publicity campaigns around smarter choices in travel behaviour) and they would usually be classed as small projects (<£5M)
4. The procedures for appraisal can be time consuming, onerous and expensive. There is an understandable reluctance to carry out an appraisal until a project has been reasonably well developed, its impacts are well understood and it has a reasonable chance of being funded. By this stage it is therefore likely to have acquired a degree of political momentum. For such a project, an appraisal outcome which suggests that the project is not beneficial is not likely to be welcome. Appraisal is therefore seen as a hurdle to be overcome rather than a tool to aid design or decide on whether a project is worthwhile. There is a clear link to option generation here, appraisal could be used as a filter or screening tool shortly after the option generation, it is difficult to see it being used in this way at the moment.
5. For major schemes, the prescribed appraisal methods can distort the selection and design of schemes in order to satisfy Value for Money (VfM) criteria. VfM has an overarching importance in the decision of national government to fund a major scheme and is narrowly defined in terms of the benefit to cost ratio of the monetised elements of appraisal (DfT, 2005). This may be in conflict with locally-derived priorities and objectives. For example, local authorities have suggested that they have problems in justifying certain types of scheme, for instance public transport schemes. These kind of schemes appear not to score as well under VfM from NATA as more “traditional” (e.g. road building) schemes. This may be because their beneficial

impacts are often less tangible and less easily quantified and valued than the impacts of highway schemes. However, it could equally well be because they don't actually have the same level of benefits (even if these were adequately represented in NATA). In any case, a public transport scheme may be justified in terms of the policy that a local authority might want to pursue, but difficult to justify in terms of an appraisal outcome.

Also related to this problem is the possible conflicts between transport strategies designed to address a range of indicators and the results of appraisal applied to the projects making up these strategies. This is important because the UK Department for Transport requires local authorities, as part of the development of their Local Transport Plans (LTPs), to develop policies and proposals to address "shared priorities" (objectives) (DfT, 2004b). There are also a range of mandatory indicators that local authorities are expected to monitor and have local targets for. The guidance also suggests that VfM is an important consideration in the development of these plans. The proposals that the Local Authority might develop to deliver their transport policy to address the objectives (and to achieve the target levels of the indicators) might not (and, in general, will not) be the optimum set of proposals in terms of VfM as defined by the output of the NATA process.

Note, however, that the proposals in an LTP are not required to be taken through a NATA appraisal process unless they form a major scheme, which cannot be funded through the integrated transport bloc. In this case a separate supporting bid for capital funds has to be made (see Section 2.6.2 above). It seems likely that LAs will assess schemes differently, depending on whether they are funded by integrated transport bloc or centrally through a bid to DfT.

6. In addition, it was felt that the distributional impacts of projects were not easy to represent in appraisal. That is, the traditional method of taking all the impacts into account and balancing them off against each other to reach a considered decision about the benefits of a project neglects consideration of who or which groups are affected by the project. In other words, the equity impacts of a project.

Problems 1 and 2 are related to a lack of knowledge about the impacts of measures and the importance of impacts. As such, effective monitoring of schemes and further research on the value that should be attached to impacts such as changes in physical health should help to address these problems.

Problem 3 could be addressed by the development of new appraisal methods for small schemes and new instruments.

Problem 4 could be tackled by a new method of initial/outline appraisal. This would be a quick and easy "proxy" for full blown appraisal which could give an early indication of how a project might perform. This would mean that appraisal might become less of an "issue" and might alert decision makers to potential problems earlier in the process. However, it does not get round the issues raised in problem 5.

Problem 5 is more fundamental and, at its heart, is really an issue about governance. Should VfM and the results of an appraisal dominate decision making even if it could capture all the aspects of what makes a "correct" decision? Conversely, should

decision making and policy development be a less technical process, which, while still transparent, takes other considerations into account, most obviously policy fit, even if this is in conflict with appraisal results. The latter approach ensures that appraisal does not “drive” policy making (though the results can still be taken into account) but does suggest that the most beneficial projects (those with the best appraisal results) should not necessarily be the ones progressed.

From the discussion at the first DISTILLATE workshop it was clear there was a feeling that Project G should avoid getting involved in the technical detail of appraisal methodologies, because this could easily use up all the resources available and would not produce a useful output for LAs. It was therefore decided that the project should look at a limited number of specific areas and issues which might be of most use to LAs.

It was decided not to pursue problems 1 and 2 further. In addition it was decided that detailed consideration of two other research issues was outside the remit of project G. These are noted here for completeness:

1. The technical drawbacks with current appraisal methodologies eg concerns over the accuracy of valuations etc. These could affect the weight placed upon a decision made following an appraisal assessment.
2. The philosophical concerns about extending appraisal into the valuation of all the impacts of a transport scheme. These include the issue of whether it is possible to put a value on certain impacts e.g. landscape. This would mean that certain impacts cannot be valued. Note however that decisions still have to be made, decisions which implicitly provide some valuation of such impacts.

From the remaining problems (3 to 6) a number of research issues/tasks were derived:

A. (from problem 3) Could a simple appraisal be developed for small schemes and behavioural and attitudinal measures? There is a lack of detailed guidance or standard practice in this area and assistance in decision making might be of significant benefit to LAs.

B. (from problem 4) Is it possible to develop an “initial/outline” form of appraisal which could be used earlier in the decision making process? This might show, at an early stage, whether a proposal is likely to perform well under a full appraisal or not. This might mean that full appraisal becomes less of a “hurdle” to be cleared after a significant amount of work has been done preparing a proposal, and the simpler form of appraisal becomes a genuine aid to decision making. Making such an assessment at an earlier stage would be inherently more risky, but this could be taken into account in the analysis. Note that this approach risks highlighting the conflict between the policy a decision maker might want to pursue and an appraisal assessment of the proposals to achieve the policy (see problem 5).

C. (from problem 5) What should be the role of appraisal in decision making? Should it dominate in the development of a strategy, or should it simply be used as just one input to the choice of instruments made by decision makers? How should conflicts between the results of appraisal and the desire to follow a particular policy be

resolved? There are obviously no easy answers to these questions, but it is important to study them with the aim of ensuring that decision making is more transparent and open.

D. (from problem 6) How should the concern about the distribution of impacts be incorporated into appraisal? LTP2 guidance says that “The Department would also encourage authorities to identify and monitor the distributional impacts of their policies and activities.” (DfT, 2004a), but gives no guidance on how this should be done.

It was also felt important that Project G was informed by a study of the political and practical context of appraisal use in LAs in order to answer questions like:

- How are decisions really made in LAs and what is the interplay between technical assessment and political imperatives?
- To what extent is the “idealised” model of LA decision making followed in practice and what is the role of appraisal in real life decision making?

There are clear links with Project D (Organisational issues) here, but the use of appraisal brings these issues into sharp focus.

Research issue A is covered in more detail in Section 5.

Research issue B is covered in more detail in Section 4.

Research issue C is discussed in the remainder of this Section.

Research issue D is covered in more detail in Section 6.

The political and practical context of LA use of appraisal is covered in more detail in Section 7.

3.3 Exploration of the possible conflicts between appraisal and other forms of strategy development

The process of appraisal is discussed at length in Section 2. There are a number of aspects of this which are particularly relevant to this discussion.

Appraisal can include consideration of a wide range of different impacts of an investment. Ideally it should be an assessment of all the impacts of a proposal (beneficial and adverse - including the costs) over a specified period of time compared to some other alternative (which is often “do nothing” or “do minimum”). It is inevitable that only some of the impacts will be capable of quantification and any analysis will involve the comparison of different types of impact.

Appraisal is an analysis tool and can be used in two different ways:

- It can be used to decide the overall net value by application in an “objective” way – that is by (as far as possible) an impartial application of valuations or

weightings to give a result. In this case, the valuations or weightings may be supported by research or empirical studies into the appropriate importance of the impact and the approach will tend to be prescriptive. Note, however, that because of the range of factors being covered, this is likely to include some form of judgement on the part of the person doing the appraisal. In this approach to appraisal, impartiality is the guiding principle in order that the assessment is, overall, as “objective” as possible.

- Alternatively, appraisal can be used in a more interactive way by (typically) the decision maker, to explore the consequences of using different weightings for different impacts, this can allow prioritisation of different objectives (eg reduction in fatalities in road traffic accidents), but implies a more subjective assessment of the relative importance of different impacts and therefore a more subjective result. In this case appraisal can be used to explore the consequences of a particular strategy, but need not determine it.

It is clear from the literature (see Section 2) that appraisal should be seen as a decision analysis rather than a decision taking technique. However, in practice, appraisal results do restrict decision making. Also, if the appraisal is based on the “objective” application of valuations/weightings (that is the first of the two alternatives above) the result inevitably acquires significant weight. That is, it potentially comes into conflict with the process of strategy development based on policies developed by the decision maker. This conflict is research issue C.

3.3.1 Evidence

In NATA (WebTAG Unit 2.5, DfT, 2004a) the AST summarises impacts, some of which are assessed by qualitative scoring, others by quantification and others by quantification and valuation (present value of benefits or costs). The aim is to assess whether the project represents value for money in terms of whether the “overall net value” (WebTAG 2.5, DfT, 2004a) is greater than the costs. It is not possible to directly compare different impacts to assess overall net value but “the person assessing the ‘overall net value’ – the ‘assessor’ – is required to derive their own estimate by exercising their own judgement about the relative importance of the various impacts” (WebTAG 2.5, DfT, 2004a). Currently, appraisal techniques (or the ones suggested by DfT) seem to be moving more towards quantifying and monetising more of the impacts with noise and carbon dioxide emissions recently being added to the impacts which are expected to be valued in monetary terms. This process will inevitably allow the decision maker less “room to manoeuvre” in terms of taking their own view on the weight an impact should have. As such, it seems more likely that the results of an appraisal on a project will conflict with a decision maker’s desire to pursue a project for policy reasons.

DfT (2005) (paragraph 3.6.1) states that “The detailed appraisal information from the NATA process allows an assessment to be made of the value for money (VfM) offered by a proposed scheme.” It makes clear that VfM is only one of five “key aspects” of scheme bids, but it does seem to have an overarching importance as a scheme with a poor VfM will not generally be funded, whereas a high VfM will give a scheme a very high chance of being funded. Value for money is defined in terms of the benefit to cost ratio (BCR) for those impacts currently monetised, with poor VfM

corresponding to a BCR of less than 1, low VfM to a BCR between 1 and 1.5, medium VfM to a BCR between 1.5 and 2 and high VfM to a BCR over 2. In this sense, the outcome of an appraisal is “making” decisions over whether a project should be funded.

Local authorities are asked by the DfT, as part of the development of their Local Transport Plans (LTPs) to develop policies and proposals to address “shared priorities” (objectives) (DfT, 2004b). There are also a range of mandatory indicators that local authorities are expected to monitor and have local targets for. The guidance also suggests that VfM is an important consideration in the development of these plans. There is a potential conflict here though. The proposals that the Local Authority might develop to deliver their transport policy to address the objectives (and to achieve the target levels of the indicators) might not (and, in general, will not) be the optimum set of proposals in terms of VfM as defined by the output of the NATA process.

Emberger et al. (2004) explored the conflict between an appraisal and a target based approach to developing optimum urban transport strategies. They found that the two approaches gave very different strategies when applied to models of Edinburgh and Leeds. This problem of the potential conflict between appraisal and policy/target based approaches is also referred to in a recent paper on the use of targets in transport policy (Marsden and Bonsall, 2006). However, it is not clear what should be done about it. Local authorities might easily find themselves trapped between the requirement to achieve certain targets and the expectation that proposals should also deliver VfM as expressed as the result of a prescriptive appraisal process.

It is important to be clear that it is wrong to say that any appraisal technique (and the quantifications/valuations it incorporates) is “inconsistent” with a particular set of objectives or their codification as a set of targets – these are two different things. The outcome of an appraisal of a proposal cannot necessarily tell you anything about whether that proposal should form part of a policy capable of achieving a particular target, though the analyses which are used to prepare the appraisal can indicate whether the proposal might contribute towards meeting a target (compared to an alternative). There may, of course, be other projects which are better at contributing towards particular targets and/or represent better value for money. In the extreme case, when the decision maker is solely guided by the results of appraisal, then this leaves them with no decision making to do – they simply select the projects which give the optimum appraisal results. These may (or may not) be in line with a particular policy or achieve given targets. The decision maker may, in practice, have a degree of flexibility in selecting the projects to be fed into the appraisal process which emphasises the importance of option generation at the start of the process.

It is also important to note that there are potentially several interpretations of what “value for money” might mean here:

- When used in conjunction with NATA it is clear that it means that all impacts of “value” are considered (that is taking into account the full range of impacts as covered in the AST) and a judgement taken of overall value for money by the decision maker. This assessment may vary between different decision makers (they may make different assessments of the weight to be attached to

different impacts), but the guidance seems to suggest that they should approach this assessment in an “objective” way (that is, without explicitly prioritising certain impacts).

- When used to describe BCR outcomes, it can only refer to those impacts that are capable of being monetised in the prescribed way. It therefore has a specific meaning in terms of a range of BCR outcomes.
- If it is considered over a restricted set of objectives, referring to a limited set of appraisal impacts (e.g. improvements in air quality), it might mean how cost effectively those objectives (or their associated targets) might be met. This might be relevant for an LA which wants to achieve (say) a casualty reduction target with the minimum expenditure.

In the documentation produced by DfT it is sometimes unclear which of these is meant. For example in the guidance to local authorities on LTPs (DfT, 2004b), one of the four “key principles for LTPs” is “LTPs should identify the best value-for-money solutions to deliver those targets”, which suggests the achievement of targets (set by the local authority) is paramount. However, later in the same document it suggests that the NATA framework should be used by local authorities to assess the value for money of their proposals, that is both major schemes and the integrated transport block spending as a whole, over which local authorities have more control. In the guidance to local authorities on bidding for major schemes (DfT, 2005), it is suggested that such bids should “reflect the principles of LTP development”, one of which is “Identifying the best value for money solutions: demonstrating how an authority will deliver its targets, and deliver the best possible outcomes to society with the available funding”. Arguably, these are two different things since the achievement of targets can, in general, never represent “the best possible outcomes for society”. This might be one reason for the concerns expressed by local authorities during the DISTILLATE scoping study. They were selecting projects to form a strategy in agreement with a policy direction they felt they should pursue (based upon projects scoring well against targets or being in agreement with DfT guidance), but finding that the appraisal of these projects was showing them to have a poor VfM (in the BCR sense) and therefore difficult to justify. This is certainly the case for a project which forms part of the Nottingham case study.

The issue is becoming more important to local authorities because both VfM and achievement of targets have financial implications. A high BCR means that a proposal is more likely to get funded. At the same time the LTP process could involve adjustments to financial settlements from central government for achievement (or otherwise) of targets. Certainly, past assessments by DfT of LA’s LTPs have affected the financial settlement. In many cases it could be the case that the types of project which are likely to score well under appraisal are not the same as those that are most likely to beneficially affect the indicators which are used to assess the success (or otherwise) of the local transport strategy.

3.4 Aspects of the problem

3.4.1 Appraisal is expensive and time consuming

This problem is linked to the tendency for appraisal to take place late in the development of a proposal, when the costs and impacts can be estimated reasonably well. By this stage, however, the project will have acquired a degree of political momentum and it is difficult for the project to be redesigned in response to a poor appraisal result.

This aspect of the problem could be addressed by the development and use of an initial/outline appraisal method as suggested in Section 4.

3.4.2 Should appraisal “drive” policy making and the development of strategies?

This is the issue raised above – should LAs select projects based upon the results of an appraisal or the policy direction they want to pursue.

In theory this conflict could be avoided by defining the strategy using the results of an appraisal of all feasible proposals, but this is letting appraisal “drive” strategy (and policy) and might result in a policy which, while optimised for VfM, is not necessarily in line with the policy direction which is suggested to local authorities by DfT (or the one they might wish to pursue).

3.4.3 Is appraisal an appropriate tool for decision making for contemporary projects?

Another aspect of the issue is how appropriate appraisal in its traditional form is for assessing many of the proposals currently pursued by local authorities in the transport area. In the past transport projects have been seen as being just utilitarian engineering projects with clearly defined costs and benefits. Increasingly, however, many have more to do with regeneration, image, civic pride, improving the urban realm (through public art for example) and improving equity. While it is possible that appraisal could be extended to try and include the benefits of such schemes, it is not clear how appropriate appraisal is as a tool to do this.

3.4.4 Are there communication issues?

Part of the problems outlined above could stem from confusion about the DfT’s position on the role of appraisal in the decision making process and their view of the conflicts with objective based or target led decision making. At the moment the local authority’s view of the situation and the weight given to VfM might be at odds with DfT’s view. One focus of this part of the project should be to find out if such differences in opinion really exist and what is the nature of them.

3.4.5 Should the primacy of policy making over appraisal be asserted?

It seems reasonable to suspect that most people would assume that a policy which has already been decided upon should take some form of priority over the results of an appraisal. This seems intuitively correct in a situation where politicians are democratically elected, partly based on the policies they intend to pursue. As such it seems justified to explore appropriate mechanisms for considering VfM while ensuring that policies can be delivered even if they include proposals which do not offer the best VfM. Such approaches could include:

- Considering VfM only within one policy area at a time or only when considering one target (e.g. an accident reduction target). This could mean selecting the proposal(s) with the best VfM which can meet the target. This approach is equivalent to taking a decision that a particular objective (target) has to be achieved and then finding the most cost effective way of doing it (where cost takes into account the value of all the impacts).
- Where the total impact of a proposal is not completely clear it may be necessary to alter the previous approach slightly to choosing the proposal(s) which offer the best VfM for improvement in an indicator. That is to calculate the VfM per unit improvement in the indicator being considered for each proposal.
- Using VfM as a hurdle only. That is deciding that any proposal with a VfM above a certain threshold level is acceptable and then deciding among the proposals which clear this hurdle. These could then be assessed on their contribution to policies/targets separately.

In all cases the proposals selected will not represent those which would be selected on VfM grounds alone. For local authorities, this may require agreement or discussion with DfT, who may have to adopt a more flexible attitude. In such cases as these it is also likely that there is a need for even greater transparency than where VfM considerations are given greater weight. If a proposal with a poor VfM is being pursued, this should be made clear, along with the reasons for this. This may require a greater effort to explain policies and proposals and the reasoning behind them than is currently the case.

3.5 Conclusion

Further consideration of all these issues will be incorporated into product G4.

4 Initial/outline appraisal

4.1 Introduction

This section describes the possible development of a method on “initial/outline” appraisal which might address some of the problems identified in Section 3 above.

4.2 Better use of appraisal in the decision making process

One reason for the possible conflicts that appear to exist is that appraisal is a significant task for local authorities and is often only undertaken at the end of an extended proposal development process. One way to address this is to develop a simpler, easier form of appraisal which can be carried out much earlier in the decision making process. This initial/outline appraisal would still be based on the NATA approach, but concentrate on the major impacts over fewer years than full appraisal. The results of “initial/outline appraisal” can then be fed back into the process at a stage when the design can be changed or even the viability of a proposal challenged without creating difficult problems (politically or technically).

Initial/outline appraisal could then become a continuing process, being carried out whenever information about the costs and/or benefits of a scheme becomes clearer and feeding in to the decision making process at various stages, perhaps through decision making “windows”, where decisions about whether to adapt, alter or even abandon a project can be taken. The final form of initial/outline appraisal could correspond with NATA, avoiding a large amount or repetition of effort, but spreading much of that effort through the development process of the proposal.

There could be a useful role for risk analysis in the method, in the sense of having some kind of “risk” or certainty rating attached to the assessment of each impact. So, an impact that was felt to be fairly certain or highly likely to happen would carry a low risk rating, whereas one which was very uncertain would carry a high one. Later in the decision making process, risk ratings could be revised (mostly downwards).

There is a clear link with the treatment of optimism bias here - this requires an uplift to costs where a project is still early in development which can affect BCR. A risk analysis approach could assess risk associated with all the impacts of a project, not just costs.

There are a number of points which need to be considered in the development of the technique:

- Thought would have to be given to the most appropriate point in the decision making process to start performing initial/outline appraisal. It needs to be at a point where there is a reasonable amount of data about the proposal, but when the proposal is still capable of being substantially changed (or abandoned).
- Initial/outline appraisal would indicate how the proposal might perform under NATA (specifically VfM) if fully worked up and taken through full/formal

appraisal. It would therefore “proxy” full NATA and the preparation of a business case for the proposal. There is an obvious tradeoff between requiring a lot of work developing the proposal and collecting data before initial/outline appraisal and the robustness of the results which obviously needs thought.

- The technique would be based on a simplified WebTAG/NATA approach (rather than indicators) but could involve a checklist approach which suggests discarding impacts which lie below certain thresholds plus simplified calculations in order to make the process easier.

4.3 Possible approaches

A number of different approaches have been identified, so far the following relevant techniques have been assessed.

4.3.1 MASCOT

MASCOT (Multicriteria Analysis of Scheme Options in Transport) is a decision support system which uses simple multicriteria analysis principles and sensitivity testing to help in the preparation and appraisal of scheme options.

The planning model that MASCOT is based on takes into account that a problem has been recognised and a transport scheme is considered to be the most suitable solution. There are various alternative options for implementing the scheme, and the aim of the planning process is to find the ‘best’ option. This is likely to involve balancing the positive and negative effects of the options against their financial costs in an appraisal of comparative value for money and against performance objectives.

The aim of the technique is to aid the planner in identifying identify which options can reasonably be rejected and which have a reasonable chance of being optimal. However, this judgement is likely to be made in uncertainty as the performance and the importance of the impacts may not be clear at this early stage and it is understood that compromises will have to be made.

MASCOT is designed to encourage a system that positively encourages an exploratory attitude of mind in the early stages of option generation, with feedback from initial designs to revisions derived from initial valuations. MASCOT accepts uncertainty about the level of impacts and aims not to seek greater accuracy until it is important for ranking the various options. It accepts ‘first cut’ range estimates of impact scores and evaluates options using this full range of scores, as well as value judgements about the relative importance of the impacts.

MASCOT tries to highlight the features of options that are critical to their relative performance. It helps planners to ‘explore the robustness of option ranking to alternative political priorities’. It tries to identify aspects of schemes that may prove to be contentious and options likely to attract support from various different groups.

The ways in which MASCOT enables exploration of the performance of options are:

- Users can specify target levels of achievement for individual targets and can then check the percentage achievement of those targets by each option.

- Users may compare the overall effectiveness of individual options and can identify the major contributions to overall performance for each option.
- It can identify options that have no chance of becoming the best option in terms of performance, therefore may be excluded from further consideration.
- It can examine the sensitivity of any options overall effectiveness to changes in individual weights or scores and could determine what changes in weights or scores would be needed to move an option to the top of the current ranking.

4.3.2 Scottish Transport Appraisal Guidance (STAG)

STAG breaks the appraisal process down into two parts the first of which is a prior/initial appraisal. The two part process is intended to minimise wasted effort by testing at an early stage whether a proposal meets certain key objectives before detailed analysis of impacts is done. The first part is a ‘simple and quick’ appraisal which is recommended before more comprehensive appraisal. This also allows for adjustments to be made to the proposal at an early stage if there are problems in performance that could be overcome. The rule of thumb is that a proposal which fails the first part appraisal test can either be scrapped with the reasons documented or revised to ensure that it passes. Once promising proposals are selected, a more detailed second part of appraisal is undertaken to look into the extent of the likely impacts.

The requirements for the prior/initial appraisal are:

- Details of the proposal including cost estimates
- Background information including the geographical, social and economic context
- Planning objectives and a summary of the proposal’s performance against these objectives
- Implementability, including technical issues (feasibility), operational issues, financial issues and risk and public issues including likely public response
- Scoping appraisal of the impacts in terms of the five NATA objectives. The relative size of each impact should be considered (major/moderate/minor/none for both positive and negative impacts including cost). These are expressed qualitatively, though if quantitative information is available, this should be supplied.

4.3.3 The regional prioritisation process – DfT (2006)

This is the process by which regions decide on which schemes to recommend for their regional funding allocation, this covers major (>£5M) local transport schemes and most Highways Agency schemes. DfT (2006) reports on how the process was carried out in different regions in the first round of this process. On this occasion, regions were also asked about how their recommendations might change if there was a 10% increase or decrease in funding.

The Government did not specify a process by which the prioritisation should be carried out but did suggest that it should be “evidence-based; agreed within the

region; realistic; and consistent with national policy objectives and regional and local strategies” DfT (2006).

The methodologies that regions used resembled each other and used scoring systems to assess each scheme’s contribution to the region’s objectives (policy fit) as well as assessing VfM and deliverability. The methodologies used were designed to inform decision makers rather than make the decision for them. They varied in sophistication, the way the results were presented and the relative weight given to policy fit, VfM and deliverability.

4.4 Proposal for the Product

The product could be used for some or all of a range of different purposes:

1. Providing an “early warning” that a scheme is unlikely to score well under a NATA appraisal, particularly in the sense of having a poor VfM
2. Assessing the “fit” of the scheme with regional and local policies
3. Making an early assessment of the risk of a scheme and the likely optimism bias that should be applied

In order to achieve 1, the product should have results which are (as far as possible) comparable with NATA, but with less onerous data requirements and be less time consuming to perform. This could include an initial assessment of which impacts are likely to be significant and qualitative scoring (as in STAG) for some impacts. Where quantitative results are felt to be important, “quick and easy” methodologies for assessing impacts should be developed, but the emphasis should be on making the product easy to use.

The assessment of the policy fit of the proposal is to ensure that schemes which do not score well under NATA/VfM are not discarded. Even if a scheme does not represent VfM, it may be possible to make an exceptional case to DfT on the grounds of excellent policy fit, or the scheme may be appropriate for other sources of funding. In either case, the transparency of decision making is enhanced.

The management of risk and the uplifts required for optimism bias can make a significant difference to the viability of a project in terms of VfM. If the risks and whether these are acceptable can be identified earlier and taken into account in the initial design of a proposal, it may be possible to reduce the uplift required.

It is proposed that the product should consist of a detailed outline for how to carry out an assessment along these lines:

- A “proxy” NATA assessment including an estimate of VfM
- An assessment of “policy fit” against LTP or Regional Transport Strategy
- An assessment of risk, acceptability of risk and required uplift for optimism bias

The stage at which the product should be used should also be specified – it may be possible to repeat the analyses a number of times during the development of a proposal and therefore track changes in (for instance) risk.

4.5 Possible problems

One possible problem is that if this process is a good proxy for a full NATA based appraisal, then the same conflicts between the results of initial/outline appraisal and the policy that the local authority wants to pursue might become apparent. It is difficult to see how this can be overcome, but at least if it is realised earlier in the process then there is more chance of the conflicts being explored in a transparent way than if it only emerges at the end of the proposal development process.

Another possible problem is that of challenge to the results of an initial/outline appraisal. If a proposal is contentious, then these results might become a focus of scrutiny. This goes against the spirit of the technique, which is meant to be quick and approximate, but decisions resting on such a technique might be open to challenge. They are obviously less defensible than those resting on a full appraisal. Also, inevitably, the results of a full appraisal might differ in some important respect from those of initial/outline appraisal. If it is known that this may be the case, does this mean that for legal reasons the proposer is forced into either performing a full appraisal or none at all?

4.6 Conclusion

This work will lead to product G1.

5 Small schemes and attitudinal and behavioural measures

5.1 Introduction

This section identifies the state of the art with regard to the appraisal of small projects, walking and cycling initiatives, and attitudinal and behavioural measures, and the problems with appraisal and decision making for such projects. The section will conclude by discussing appraisal procedures for small schemes put forward by Goodwin (2004), and identifying key issues to be investigated through the DISTILLATE appraisal research. The DISTILLATE work seeks to develop assessment procedures suitable for use in local authority decision making regarding such projects. Throughout the discussion, the need to achieve a final appraisal or assessment procedure that is simple to use and proportional to small projects is to be borne in mind. Thus, procedures proposed will be non-technical where ever possible, and the material reviewed here will necessarily reflect this.

The need for new assessment procedures is stated succinctly by Ker (2001):

“Transport strategies have changed direction very substantially in the past decade or so, but the methodology of evaluation has not kept up, often because the linkages between new initiatives and outcomes are not clearly-enough defined or well-enough quantified. In addition, evaluation methodologies, in practice if not always in theory, often assume that ‘more is better’ and have difficulty coping with change that includes changes in what we do (activity patterns) as well as how we get there (travel). Our tools favour the status quo and, consequently, new initiatives often have great difficulty getting funding.”

This favouring of the status quo may in part derive from the reactive nature of appraisal development, where by new procedures are developed after a need is identified. The work discussed here follows this model in responding to a need for appraisal procedures for attitudinal and behavioural measures, and other small schemes. However, in defining small schemes a broad definition is sought to encompass as many future needs as possible. Working definitions of small schemes, including attitudinal and behavioural measures, are outlined below before moving on to consider the state of the art.

5.1.1 Attitudinal and Behavioural Measures

Attitudinal and behavioural measures is the group of policy instruments now referred to as Smarter Choices (Cairns et al, 2004). The policy instruments included in Smarter Choices are:

- Car sharing and car clubs
- Travel awareness campaigns
- Personalised travel planning [aka individualised marketing campaigns]
- School travel plans

- Company travel plans
 - Home shopping
 - Teleconferencing and teleworking
 - Public transport information and marketing
- (Cairns et al, 2004).

It is likely that DISTILLATE will not be directly concerned with all of these measures. For example, home shopping is generally facilitated by commercial retailers, and is merely encouraged in some work to reduce the need to travel. Thus, decisions about whether to implement a home shopping facility are not taken in the public sector, and are not subject to the same decision making process. However, with road pricing moving up the political agenda, local authorities may become increasingly involved in at least supporting means of reducing the need to travel, and thus transferability of procedures developed through this work to new forms of small project needs to be borne in mind. Local authority views on which of the Smarter Choices listed here to focus on would be welcome.

5.1.2 Small Projects

Defining small projects is less clear cut. The DfT's New Approach to Appraisal (NATA) introduced in 1998 is now the basis for:

- “appraisal of multi-modal studies;
 - appraisal of Highways Agency road schemes and Local Transport Plans major road and public transport schemes;
 - the Strategic Rail Authority's Appraisal Criteria;
 - the project appraisal framework for seaports; and
 - the appraisal process employed during the development of the Government's airports strategy”
- (DfT, 2004a)

All of these schemes are by definition large projects. Local Transport Plan (LTP) “major schemes are currently defined as those whose gross cost is greater than £5m and where clear additional benefits accrue from the proposal being treated as a single scheme and implemented as such” (DfT, 2004a). On this basis, small projects, which are generally part of an LTP as well, could simply be defined as anything costing less than £5m. However £4.99m could fund a very broad range of projects, including short stretches of road widening for example, and discussions with local authorities suggest that this is not what they mean by “small projects.” The initial stages of the research into small projects will discuss with local authorities and DfT how ‘small projects’ should be defined for the purposes of this work such that it will lead to transferable results.

The current understanding though is that for local authorities “small” tends to refer more to neighbourhood projects such as Home Zones, or other traffic calming and road safety schemes; initiatives to stimulate voluntary reductions in car use (i.e., Smarter Choices), including provision of walking and cycling facilities, and increasingly work to tackle social exclusion through accessibility planning. A common thread is that often, these projects cannot be funded from capital budgets.

Infrastructure and buildings related projects, and even purchase of new vehicles (buses) can be funded through capital, but projects without tangible physical outputs cannot be. However, a number of local authorities have been able to incorporate small projects with intangible final outputs into their capital projects, and infrastructure for walking and cycling, and traffic calming are clearly infrastructure in the first place. Thus defining small as revenue funded projects is not appropriate. Taking the economic default definition implied by DfT appraisal guidelines, and the local authority working definition, small projects could be defined as, all projects costing less than £5m designed to achieve voluntary reductions in car use, tackle social exclusion, or improve communities, including improvements in safety. Taking this definition forward, the term small projects will refer to walking and cycling projects, and Smarter Choices as specified in the proposal throughout report.

Assessment and appraisal of small projects remains in its infancy for a number of reasons. Firstly, judging what impacts a project will have is necessarily based on past experience, and the evidence base for some small projects, especially the newer Smarter Choices, and Home Zone type schemes is limited. Secondly, a full blown project appraisal is a time consuming and costly process, thus decisions regarding many small projects are based more on judgement, informed by a limited evidence set than anything else. Discussions with local authorities revealed that some form of qualitative multi-criteria analysis of expected outcomes against objectives was common, although need to comply with Government policy was justification enough in a few cases. Nevertheless, procedures for small project appraisal are being developed by a number of actors in the field (Fellows and Pitfield, Goodwin, 2004; 2000; Ker and James, 1999; Pratt et al, 2000; Tisato and Robinson, 1999; Wang et al, 2005). Some methodologies are developed through research into the overall development of small project procedures, whilst others are built up by local authorities and action groups. Given this, development of small project appraisal procedures is more advanced in areas with more years of experience, and those that have attracted greatest research funding. Unsurprisingly then, there is more work in relation to walking and cycling initiatives (primarily infrastructure initiatives; Pratt et al, 2000; Wang et al, 2005) than anything else, but there is also some work concerned with personalised journey planning (PJP; Ker and James, 1999; Tisato and Robinson, 1999) and car sharing (Fellows and Pitfield, 2000). In relation to the walking and cycling work, a number of papers evaluating road safety initiatives have also been published. The various papers relating to these categories of small projects, and a number of more general papers are reviewed in Section 5.2.

5.2 Appraisal of Small Projects

Currently, there are no specific procedures guiding decision making for many small projects. There are technical guidelines concerned with infrastructure schemes such as walking and cycling facilities, but for attitudinal and behavioural measures, there are none. Some development work, centred on CBA has taken place (Fellows and Pitfield, 2000; Ker and James, 1999; Tisato and Robinson, 1999) in relation to specific attitudinal and behavioural measures, but transferable procedures have not yet evolved. The work by Goodwin (2004) by contrast is based on qualitative assessment, and is more transferable. However, a standard set of appraisal procedures are not yet in place, and questions remain over the range of impacts that an assessment should consider, and the best procedures. In light of this, the following sections present a

brief outline of appraisal, and impacts from a range of small projects that will inform work with local authorities regarding how to appraise such schemes.

The DfT state that whilst full project appraisal is not needed for projects that do not fall into the categories listed under Section 5.1.2, the procedures should be taken as good practice (DfT, 2004a). DfT's introduction to appraisal also states that, "transport appraisal is carried out to provide input to efficient policy development and resource allocation across government. To be effective, transport appraisal must deal consistently with competing proposals, be even-handed across modes and take account of a wide range of effects" (DfT, 2004a). Given the biases in development of appraisal for small projects compared to the list of attitudinal and behavioural measures, and full range of possible small projects, it is very unlikely that in the case of small projects, decision making is "even-handed across modes" (DfT, 2004a). Further, DfT state that, "the decisions made as part of the delivery [of integrated transport policy] need to be based on a full range of options and a comprehensive analysis of the impacts using a consistent approach" (DfT, 2004a). Again, it is unlikely that this happens in all cases with regard to small projects. Local authorities often express a desire to improve decision making with regard to small projects, but without statutory requirements as part of the LTP process, it is often difficult to devote resources to developing procedures, especially for smaller authorities. In arguing a need for more consistent appraisal for small projects, the need for procedures to be proportionate to the size of a project must not be over looked. DfT (2004a) note that appraisal should be "comprehensive but proportionate," and developing such procedures is the objective of this research.

A typical appraisal study should include the following stages: agreement of a set of objectives; analysis of present and future problems; exploration of solutions; appraisal of solutions, seeking appropriate combinations, and selection of options (DfT, 2004a). Appraisal is undertaken against the Government's five key transport objectives using the Appraisal Summary Table (AST), as set out in Section 1 of this report. In addition, there are three further distinct parts to an appraisal, including achievement of regional and local objectives, effectiveness of problem solving, and supporting analysis, which includes distribution and equity, affordability and financial sustainability, and practicability and public acceptability (DfT, 2004a). The research undertaken through DISTILLATE will endeavour to mirror these phases as far as possible whilst developing procedures that are proportionate to the scale of small projects. In developing proportionate procedures, "achievement of regional and local objectives" is likely to be particularly crucial, since impacts may not be felt directly above this scale. Contribution to national objectives is more likely to be through contribution to cumulative impact in conjunction with other similar projects from around the country. An emphasis on regional and local objectives (which will be decided through collaboration with local authorities) will also avoid restrictions that could be imposed by concentrating exclusively on the Government's five national objectives, and provides the potential to incorporate objectives linked to local area targets and PSA's. It is likely that use of multi-criteria analysis (MCA) similar to that presented in current AST's will be at the core of the process, although for some objectives procedures to complete the table will need to be simplified to avoid the need for a full social CBA.

5.2.1 Appraisal of Walking and Cycling

The DfT has recently published a new WebTAG Unit on the appraisal of walking and cycling schemes, in the consultation section of WebTAG (WebTAG Unit 3.14.1, DfT (2004a)). This includes guidance on the valuing of impacts particularly associated with cycling and walking and closely follows the NATA framework. The following sections provide a more general background to the appraisal of cycling and walking schemes.

Hathway (1996) notes that despite “growing acceptance that the headlong pursuit of personal motorization will neither improve mobility nor quality of life for the majority of the population in large cities. ... both ... [mass transit and non-motorized modes] face great difficulty in being accepted as sensible investments that produce a satisfactory rate of return.” Whilst this statement pre-dates the introduction of NATA, many supporters of walking and cycling feel the situation remains true today, citing the fact that walking and cycling facilities do not generate wealth as a reason. By contrast, roads are perceived as conveying passengers to and from jobs, shops and other commercial activities, as well as freight, and require money to be spent on travelling (fuel, tax etc), all of which has a direct economic impact, whilst walking and cycling convey fewer people, no freight and require minimal spending to use. However, this does not mean there are no economic impacts. Passengers are still conveyed, all be it potentially more slowly, health benefits represent savings to the NHS, and less congestion reduces costs to business. Overall then, alternatives to the car, such as walking and cycling, have economic benefits in terms of avoiding uncharged external costs, which show up as costs to other sectors of the economy.

“Whitelegg (1993) claims that the outcomes [of CBA] are rigged because of a cultural commitment to time saving” (Hathway, 1996), which is fundamental to economic impact assessments within transport project appraisal. This commitment to time savings remains today, meaning that slower travel by walking or cycling counts against these modes. However, the difficulties it causes are the subject of current DfT efforts, and are thus, not a focus of this research. It is argued here that for short trips, walking and cycling does not take significantly longer than travelling by car, and well designed facilities will result in modal shift for appropriate journeys, resulting in reduced congestion and journey time for those who continue to drive provided appropriate restraint measures are implemented to prevent induced traffic. In cities with good cycle facilities commute trips, business travel and other important trips are undertaken by bicycle, demonstrating that speed is not necessarily the only consideration in mode choice where facilities allow a pleasant and safe journey by bicycle. Indeed the cost savings derived from better health resulting from increased physical activity could conceivably outweigh the positive financial benefits attributed to travel time savings.

Two recent studies have considered the cost-benefit analysis of providing walking and cycling tracks. An American study by Wang et al (2005) established a positive cost-benefit ratio of 2.94, derived from monetised direct health benefits to the individual divided by the total annual cost per trail user. Direct health benefits were “measured using the estimated difference in the direct medical cost for active persons and their inactive counterparts (excluding persons with limitations)” (Wang et al, 2005). “Active persons spent \$330 less on medical care than did inactive persons in 1987.

Adjusted to 1998 dollars, this figure is \$564” (Pratt et al, 2000). The total annual cost per trail user was based on total construction costs allocated over a 30 year period, plus annual maintenance costs, divided by the number of uses of the trail per annum, multiplied by 52x3 (i.e., 3 uses per person per week of the year), plus an equipment and travel cost of \$150 for each user (Wang G, 2005). The calculations here are simple, although the direct medical costs appear to be based on rather out of date data. Simplicity is ideal for ensuring that appraisal remains proportionate to the small scale of projects; however, there are a number of problems with transferability to the UK situation.

Firstly, direct medical costs are not easily available in the UK since private health care is not the norm. In the UK, savings accrued by the NHS from individuals walking and cycling would need to be calculated, and devising procedures for this would most likely require extensive research. Secondly, the very fact that health spending is so fundamental to the CBA is problematic because transport project appraisal in the UK is only concerned with direct costs and benefits relating to transport. Cross cutting CBA may in cases like this be more informative, but it is not current practice. A useful proxy for medical costs might be individuals’ willingness to pay for provision of walking and cycling facilities to facilitate physical activity, but this would rely on individuals being fully aware of the benefits to themselves.

Another issue with Wang et al’s (2005) CBA for use with UK small transport projects is that a number of items are not considered. The inclusion of a figure for “equipment and travel” implies that the trails on which the CBA is based are used for leisure trips, and that individuals would drive to the trail. Perhaps because of this, there is no consideration of external costs of motorized traffic in terms of pollution or accidents, and it is likely that these costs would be fundamental. Both of these issues are considered in NATA, but in terms appropriate to motorised transport. Local air quality is considered in terms of the population exposed to pollution, whilst Greenhouse gases are considered in terms of CO₂. For walking and cycling exposure of cyclists and pedestrians to pollution would be more appropriate, whilst reductions in CO₂ resulting from any modal shift would also be appropriate. Obtaining accurate figures regarding pedestrian and cyclist exposure to pollution under different scenarios would again require extensive research, although potential reductions in CO₂ may be more easily calculated. In terms of local air quality a proxy might be willingness to pay for provision of routes away from major traffic flows, but this would rely on individuals being fully aware of the benefits to themselves of a less polluted alternative. A number of other items, including travel time for example are also excluded from Wang et al’s CBA, although again this may be because the trails appear to be catering for leisure activities.

The second study, by Sælensminde (2004) was based in Norway, and includes a number of factors relevant to more functional A to B walking and cycling activity. Sælensminde incorporates a number of benefit components including accidents, travel time, personal security (in terms of increased insecurity), school transport (because school children in Norway are offered bus trips to and from school if the route they would need to use is too dangerous to walk or cycle), illness and absence from work (in terms of individual welfare costs and costs to employers), parking costs (cost to employers of providing parking spaces), and external costs of road transport including air and noise pollution, congestion and infrastructure costs. For many of the benefit

components accurate costs are difficult to obtain, and thus conservative estimates based on available data are used along side conservative estimates of the number of additional walking and cycling trips new facilities would attract. For example, it was assumed that there would be no change in the number of accidents or in journey time, when in fact, well designed infrastructure with crossings should reduce accidents involving pedestrians and cyclists, whilst travel time may decrease for those who previously experienced severely congested conditions. Despite this conservative approach positive cost-benefit ratios are obtained in the three cities studied (Hokksund 4.09, Hamar 14.34 and Trondheim 2.94). Costs included in the CBA are capital, maintenance and tax. By including welfare costs, there is again an element of cross-sector analysis in Sælensminde's work, but the use of estimated costs based on available data means that the CBA remains simple, and therefore appropriate to small projects, whilst the conservative approach mitigates the risk of over estimation. Sælensminde also calculates the cost to society of not implementing walking and cycling based on the original CBA and the benefits lost. It would seem appropriate that the benefit components used by Sælensminde are incorporated into the appraisal for walking and cycling facilities in the UK. By considering health in terms of reduced absence from work, it may be possible to build this into the Transport Economic Efficiency (TEE) calculations, along with parking costs. However, it may be that in keeping the appraisal proportionate to small projects the complex TEE calculations are omitted, and instead a simple CBA as used by Sælensminde is developed based on the AST.

Despite the more comprehensive approach taken by Sælensminde, there remain a number of additional items that would be required for some schemes to encourage modal shift to walking and cycling. The work by Wang and Sælensminde was concerned solely with infrastructure provision in terms of tracks and trails. A more comprehensive scheme may also include provision of cycle stands and lockers, although this cost could easily be incorporated into construction costs. Other additional features might include awareness work to promote the new facilities, more detailed information on new routes and facilities, launch events, and cycle training/buddying schemes. Following the simple CBA procedures of Wang and Sælensminde, it would be possible to add these items to the cost side of the equation, and factor up benefits to represent additional modal shift achieved by the additional scheme components. Care must be taken when factoring up benefits though, since transfer to walking and cycling could as easily extract from public transport as car use, but the former will have less impact in terms of reducing external costs of congestion and pollution. Estimates of modal shift can be taken from past case studies of work to increase walking and cycling. An alternative to CBA would be the qualitative assessment procedure proposed by Goodwin (2004), as discussed below. Explicit questions concerning the potential to reduce external costs of travel and appropriate communications could be added.

5.2.2 Appraising Personalised Journey Planning

With regard to appraising PJP projects, a number of papers have been written regarding the cost-benefit analysis of the individualised marketing campaign (TravelSmart®) in South Perth, Western Australia. Individualised marketing campaigns, or PJPs are one of the range of transport demand management measures (TDMs) as well as being an attitudinal and behavioural measure. TDM measures seek

to reduce the number of, and/or distance travelled by private road vehicle, and thus the financial impacts beyond set up costs area generally in terms of external cost savings, and revenue from charging where this is implemented. Other financial impacts include increased public transport revenue (arising from modal switch), and reduced fuel tax revenue (through reduced expenditure on fuel).

In terms of personal travel, there may also be a reduction in total trips made, and/or distance travelled through trip chaining, increased use of local amenities, multiple activities in one place and home shopping (although this latter means of reducing personal trips can increase freight mileage). Such overall reductions in travel will result in reduced expenditure per se. Further, increased use of walking and cycling, and to an extent public transport, may increase journey times, which is traditionally seen as a cost on the basis that 'time is money'. However, it is possible that benefits, e.g., better health, which may result in fewer days sickness absence from work, as well as a reduced burden on the health services, could outweigh the costs of increases in journey time.

The transport impacts of the South Perth pilot TravelSmart® project included:

- A reduction from 79% to 75% of cars used each day,
- A reduction from 3.3 to 2.9 trips per car per day,
- A reduction of 14% in car-kilometres,
- Increased use of local shops,
- 2 kilometres less travel per person per day, but 4 minutes additional travel time,
- Changed modes for all types of trips.

Ker and James (1999).

Conversely, traditional interventions to increase capacity, such as road building, or a new rail service generally result in more trips, reduced journey time, increased external costs, and also increased expenditure per se. It is this traditional set of costs and benefits arising from the predict and provide approach to transport planning that much transport project appraisal was originally designed to appraise. For example, NATA was introduced by the then new Labour Government in its 1998 review of the previous Government's road building programme. Despite being designed to review traditional road building schemes NATA was designed with recognition of the need to move away from predict and provide to more integrated transport, and thus has a more extensive range of direct and indirect external costs incorporated than many transport project CBA processes. Whilst means of monetising all external costs and benefits have not yet been devised, NATA uses a combined cost-benefit and multi-criteria analysis (MCA) approach for the final assessment to enable the consideration of costs that cannot be monetised. In the Australian context, Ker and James (1999) note, that to appraise TDM measures, items in the cost-benefit analysis need to be revised, and the emphasis on quicker travel times reduced. Despite the advanced nature of UK transport project appraisal, this need to resolve problems caused by over emphasis on value of time (VoT) is as true in the UK as elsewhere, and is a focus of DfT work as noted previously.

Ker and James (1999) also note that maintenance costs for PJP are not known. Monitoring tells us that the impact of PJP does last over time for a period of two to

three years, but there are small annual increases in car use, which means that eventually, further marketing could be needed to maintain the effect. So for example, where monitoring immediately after intervention reveals that car use decreased by 4% compared with baseline levels before intervention, monitoring a year later may show an increase of 1%, and two years later a further 1%. This means that after two years, the reduction in car use has been eroded to 2% (compared with baseline), and could be neutralised after 4 years. If the rest of the population also increased their car use by 1% annually, then the TravelSmart® participants would still have lower car use than the general population, so there is still a TravelSmart® impact, which would remain if TravelSmart® participants, and the rest of the population continued to increase their car use at 1% per annum. However, maintenance intervention with TravelSmart® participants could potentially stop their car use increasing year on year, or reduce the magnitude of the increase. There are no examples of repeat applications of PJP, or even a reduced form of follow-up intervention, so it is not known what impacts maintenance activity would have, or what the costs are. Thus, for the purposes of appraisal it may be safest to assume that after five years participants of PJP projects will have returned to their pre-intervention levels of car use, but that this will still be lower than that for the rest of the population, assuming everything else stays the same.

Whilst Ker and James (Ker, 2001; Ker and James, 1999) constructively criticise transport CBA, they do report a positive cost-benefit ratio arising from TravelSmart®. Similarly, Tisato and Robinson (1999) also report positive CBA for Travel Blending® as applied in Adelaide, Australia. Ker and James (1999) conclude that “using methodology and values consistent with the evaluation of road projects, the socio-economic benefits of individualised marketing for South Perth exceed the costs by a factor of between 11:1 and 13:1, over 10 years, and 12.5:1 to 15:1 over 30 years. These benefit-cost ratios substantially exceed those of investment in metropolitan road infrastructure.” Tisato and Robinson (1999) report a benefit-cost ratio of 5.7. It is worth noting here that fewer items, and fewer monetised items, are included in the Australian CBA used by Ker and James (1999), and Tisato and Robinson (1999), than are included in the UK NATA AST. Further, it appears that there is greater public sector involvement in public transport operation in Australia, and thus a greater proportion of the costs and benefits accrue to the Government, whilst in the UK, fare box revenues go entirely to the private sector unless transfer payments are set up to off set provision of dedicated infrastructure. Conversely, health care spending appears to be almost entirely in the private sector in Australia. As a consequence of these differences, the CBA procedures used by Ker (2001), Ker and James (1999), and Tisato and Robinson (1999) are not directly transferable to the UK situation. Further it is argued here that not all impacts of PJP are included in the afore mentioned CBA analyses. For example, more walking and cycling is thought to increase community spirit within neighbourhoods, and could lead to increased social capital. It is possible that this could be accounted for through the AST entry for “severance”, but it is not currently. Similarly, where children are able to travel to school by non-car modes, independently, or accompanied, they learn to varying degrees more about finding their own way around and looking after themselves (Hillman, 1993), and this is not considered in current CBA practices.

Overall, Tisato and Robinson (1999) use a similar set of costs and benefits to Ker and James (1999), although physical fitness appears to receive little attention. Significantly though, they note different results from Travel Blending® in terms of

travel time. Individual participants experienced a reduction in their total travel time per week, whilst reductions in car use would result in a reduction in network congestion, representing travel time savings for others. It is argued here that network based travel time savings would only hold if PJP were combined with restraint measures to prevent induced traffic from filling the space. Nevertheless, where PJP can create travel time savings, perhaps through greater trip suppression or replacement with a more efficient home delivery services, problems with the current emphasis on VoT would be less problematic. However, it would be prudent to develop appraisal procedures that can cope with an increase in individuals total travel time, and where there are no restraint measures, no change in network congestion levels after a period of time.

5.2.3 Appraising Other Attitudinal and Behavioural Measures

Relative to PJP, little has been written about the appraisal of other attitudinal and behavioural measures. With regard to Travel Plans the range of costs and benefits has been established for a number of years, with companies needing to make a business case for their Travel Plans, and identify benefits that accrue directly to the company as well those that enhance the greater good. Pontefract (2000) helpfully draws together the range of costs and benefits from a business perspective and provides quantification where possible, although external costs and benefits are not considered, and scrutiny does not go as far as CBA.

Fellows and Pitfield (2000) produced a paper concerned with the appraisal of urban car-sharing schemes using the UK Government's specified cost-benefit analysis techniques (COBA). This is useful in as much as COBA underlies NATA, making appraisal of car sharing on this basis comparable with appraisal of road schemes, and other more traditional interventions. However, results are only presented in terms of costed benefits, including VoT, vehicle operating costs (fuel and other), accidents and net present value (NPV). The traffic impacts of car sharing were calculated on the basis of an x% reduction in car use across the network as analysed using SATURN, however, it is not clear how the costs of setting up, and operating a car sharing scheme are dealt with. Similarly, a full appraisal based on the AST is not considered. Given the indirect costs and benefits associated with attitudinal and behavioural measures this is unfortunate. For example, car sharing will result in financial savings for individuals, which could result in increased spending elsewhere in the economy. This could be dealt with as a transfer payment, but changes in severance due to reduced congestion, but increased traffic speeds would not be incorporated into COBA. One should also remember that reduced spending on fuel will reduce tax revenue for the Government, and that restraint measures are likely to be necessary to avoid induced traffic negating travel time savings accruing from reduced congestion. Whilst the contribution made by Fellows and Pitfield (2000) is useful in that use of COBA makes their work directly comparable to appraisal of infrastructure schemes, it is argued here that greater explanation of how costs and benefits were represented, and use of the full AST would have provided significant added value.

Other attitudinal and behavioural measures are not considered in the transport appraisal related literature so far as the author is aware. For measures such as flexible working hours, promotion of telecommuting, or e-commerce this is perhaps not surprising. These initiatives have been in operation for many years (or as long as

technology and working practices have allowed) in the business and industrial sector, and have only recently been thought of as useful to the implementation of transport policy. Consideration of these measures does raise interesting questions regarding the appraisal of Travel Plans though. Since Travel Plans are made up of combinations of initiatives to encourage modal shift, as well as telecommuting, and car sharing for example, how should Travel Plans be appraised? It is likely that the combining of measures in a Travel Plan has a packaging effect that means the sum of the whole is greater than individual parts, but as yet, the added value of the packaging effect has not been proven or quantified.

5.2.4 Valuing the Small: Counting the Benefits

One of the few reports that directly tackles the issue of appraising small projects is Goodwin's (2004) 'Valuing the Small: Counting the Benefits'. A summary and critique of the report in the context of DISTILLATE research is provided here. As highlighted by Goodwin, a number of reports (Sloman, 2003; Cairns et al, 2004) have demonstrated that small-scale projects "can be effective in tackling transport problems, especially when used in combination," yet "*in-built biases* (sic) in current appraisal techniques – developed, as they were, in a different time and for a different agenda – which discriminates against some of the best measures, and for some of the least effective" (Goodwin, 2004). Goodwin argues that appraisal of small schemes based on current appraisal procedures would merely duplicate the inappropriate aspects of current appraisal in that for small projects. However, there is an obvious need to assess projects against the same criteria as far as is appropriate to enable decisions on a level playing field, as comparison as far as is possible between large and small schemes. Whilst current cost-benefit procedures have their origins in the 1960s and 70s (as Goodwin points out), transport appraisal procedures were substantially revised in 1998 with the release of NATA (DETR, 1998), and again in 2000 when the Guidance on the Methodology for Multi-Modal Studies (GOMMMS) was released (DETR, 2000). NATA and GOMMMS introduced assessment criteria that meant appraisal would better represent the three pillars of sustainability based on a policy focused on integrated transport, and begin to move away from over emphasis on economic factors. New criteria introduced by NATA and GOMMMS included integration, social inclusion and accessibility for example. Whilst the definition of some of these new criteria is not perfect, and was constrained by what was technically possible in terms of appraisal methodologies at the time NATA and GOMMMS were introduced, it is argued that current appraisal procedures do provide a useful starting point for the research proposed by DISTILLATE. Further, since NATA and GOMMMS were introduced guidance has continually been updated. New procedures for the appraisal of noise were introduced in 2006 (DfT, 2004a), and work is on going to introduce new rules for the appraisal of cycling and walking schemes (LTT, 2006), and improve coverage of social and distributional impacts through past research (Jopson and Nellthorp, 2004; Nellthorp and Jopson, 2004) and currently tendered work. Clearly care must be taken not to carry forward the weaker definitions in current appraisal procedures wherever possible, but in recommending procedures for the appraisal of small projects, there is no reason not to include revised definitions of certain criteria.

Goodwin goes on to set out the key features of current appraisal – which are not included here, since that would duplicate earlier sections of this report – and the key problems current appraisal procedures present for assessment of small schemes. These are discussed below.

Goodwin (2004) begins with one of the most stark problems for use of current appraisal with small schemes, that of “proportionality of effort and bias against small schemes.” Goodwin notes the following dilemma; choose a full-scale appraisal whose cost is out of proportion to the scheme being considered meaning the budget is taken up with studies rather than implementation, or choose a short cut that is “likely to show the initiative in a bad light.” By short cut, Goodwin is referring to the traffic modelling procedures which would use a fixed traffic matrix, as opposed to a variable matrix. In the former, traffic diverted from road A when a bus lane is installed resulting in a reduction in road capacity for cars, would appear elsewhere on the road network as there is no option for a reduction in traffic. Conversely a full blown variable matrix model would permit car drivers to choose other options, and indicate what options are chosen. However, there is a third option – elastic assignment. Certain models at least (e.g., SATURN) permit elastic assignment, which would allow traffic to disappear from road A once the bus lane is installed, but would not tell you what happens to that traffic. Whilst elastic assignment is more complex than fixed since appropriate figures need to be derived for the elasticity coefficient, it is still substantially less effort than a full scale variable modelling procedure (Woodham, 2006). One also has to ask though, if there is real world evidence on the impacts of installing a bus lane, or other small scheme, in terms model shift and changes in traffic flow, why can this not be used in place of modelling for such schemes?

Another significant problem Goodwin highlights is that of travel time savings. Perhaps most importantly, many small schemes “do not actually try to make time savings” (Goodwin, 2004). Indeed, as Goodwin notes, some schemes may increase vehicle travel times in favour of pedestrians for example. Goodwin also asserts that induced traffic is often underestimated, thus the expected travel time savings are not achieved in the medium to longer term; that travel time savings are discussed in total rather than per person, thus making savings looking more significant than they actually are in terms of personal travel decisions; and that discounting masks the fact that value of time grows in line with income.

In terms of accidents, Goodwin concludes that the case for “fairly cheap local traffic management procedures” is “already well-made by the present appraisal procedure,” and thus does not call for substantial revisions in this area. However, Goodwin does note that the same value is accorded to accident reductions whether they are prevented through measures that enhance the built environment for sustainable travel, or detract from it. Thus, as Goodwin illustrates, preventing x pedestrian accidents by erecting a barrier stopping pedestrians from getting near to, let alone crossing the road, is valued the same as preventing x pedestrian accidents by creating a more “pleasant streetscape with slower vehicles.” The latter though, is far more likely to induce travel behaviour change in favour of walking and a range of transport policy objectives, and is thus deserving of a higher value. However, it is contested here, that including assessment of environmental quality and potential impact on mode choice created by accident remedial measures would be double counting, since environmental quality should form part of the journey ambience assessment. Granted, there is no current way of

monetising journey ambience making the trade-off with monetised accident savings difficult, but if environmental quality cannot currently be monetised it would be extremely difficult to incorporate into the accident saving values anyway. The DISTILLATE work will consider previous work by Jopson and Nellthorp (2004) which looked into the appraisal of journey quality, and consider how accident reduction, and journey quality might be brought together in the decision makers mind.

The second issue that Goodwin raises in terms of accidents is concerned with the treatment of accidents on the railways compared with the treatment of all other accidents. Goodwin states that rail accidents are “more highly valued than road accidents,” with the consequence that rail operators must put expensive remedial procedures in place, thus driving up fares and encouraging potential passengers to travel by road (which is more dangerous even without more advanced accident remedial measures on the railways). However, this seems to be more of a values used problem, than a fundamental problem with appraisal procedures. Further, it is extremely unlikely that any rail project would ever fall into the category of small, and thus the remit of the DISTILLATE work. Associated schemes such as information provision, or access to rail services may do, but neither of these would need to be concerned with accidents on the railways themselves.

In terms of appraisal of environmental impact Goodwin does not raise any issues with the procedures used, rather with the cost of proving environmental benefits. The high cost of proving environmental benefits means that it is out of proportion to the overall cost of a small project, and thus is often not undertaken, making small schemes appear inferior. It is argued here that this is an area where real world evidence from past projects could be brought to bear on the appraisal alongside some basic questions to assess the potential for negative environmental impacts, directly or indirectly.

With regards to the impact of transport initiatives on the wider economy, Goodwin (2004) notes that, “there is little firm factual evidence of the effects ... on economic growth, regional regeneration, or the competition between neighbouring towns, areas or countries.” Visual analysis of changes in national GDP alongside changes in road traffic intensity (see Figure 3 and Figure 4) suggest that there is a link between transport intensity and economic growth (as is commonly assumed), although rates of growth vary between transport and GDP, as well as over time and between regions, although the nature of the relationship remains uncertain (SACTRA, 1999). Despite the uncertainties SACTRA (1999) note that transport intensity and GDP can grow at different rates (as illustrated by Figure 3 and Figure 4), indicating that it is possible to separate transport intensity and economic growth.

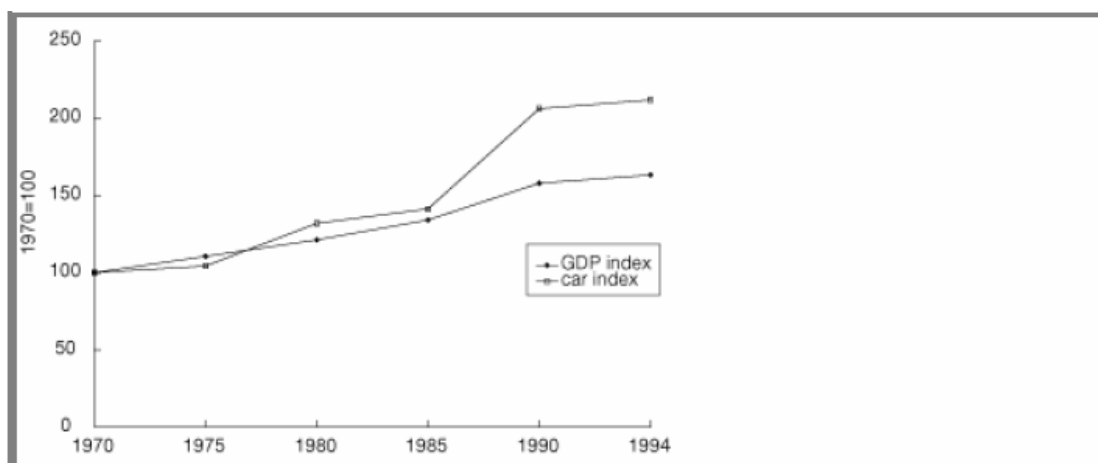


Figure 3 United Kingdom – Car Traffic and GDP, Source: SACTRA (1999).

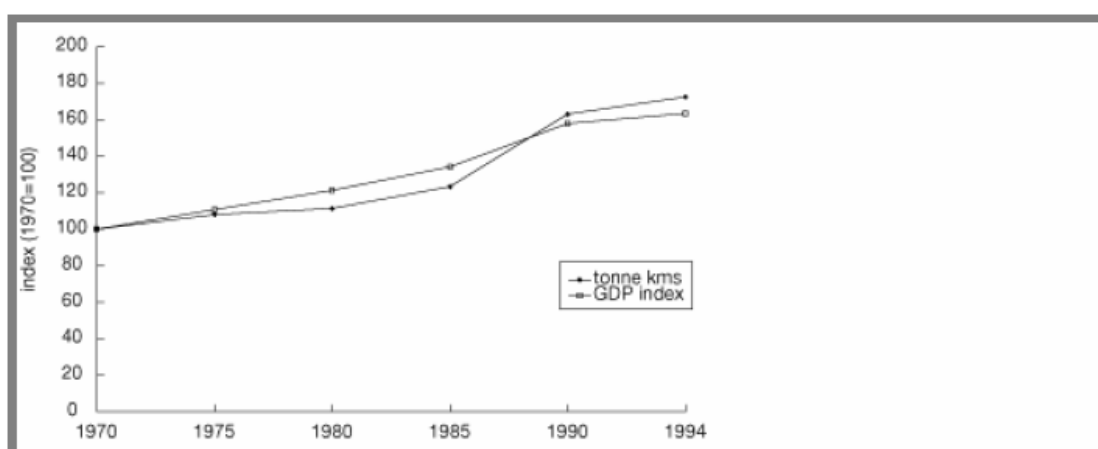


Figure 4 United Kingdom – Freight Traffic and GDP, Source: SACTRA (1999).

Uncertainties aside, SACTRA were able to draw a number of useful conclusions for assessing wider economic impacts in appraisal, and these are reported by Goodwin (2004). Firstly, “where the local economy is not distorted by monopoly, excessive subsidy or uncharged external costs, the initial economic benefits calculated in a cost benefit analysis are a reasonable approximation to any wider economic impact that may occur subsequently,” i.e. the common assumption that transport improvements result in economic growth is acceptable where the conditions outlined exist. However, given the monopolistic characteristics of the public transport industry in the UK, the existence of subsidy, and uncharged external costs it is unlikely that the above assumption would be valid in most scenarios. Given this and SACTRA’s further conclusions (as reported by Goodwin) that transport improvements can make things better or worse, and may not accrue to the target area, Goodwin concludes that where uncharged external costs dominate, it is likely that policies to increase the cost of transport, or achieve similar results through traffic restrictions and demand management, “are more likely to have a beneficial wider economic impact than a harmful one.” This is in line with SACTRA’s (1999) conclusions that the introduction of charging to internalise external costs will result in more efficient use of transport, and thus economic benefits, in the same way as efficiency in any other sector of the economy results in benefits¹.

¹ It is worth noting here that Goodwin was a member of the SACTRA committee.

In light of these conclusions, Goodwin suggests two basic questions concerning travel costs: “are effects on travel prices neutral/intended?” and “if prices increase, do you assess that they were lower than marginal social costs?”. Where prices do increase, and a judgement regarding marginal social costs is needed, the procedure for this assessment needs to be clear so that decisions are made on a consistent basis. Thus it would be better to derive some rules for answering this question from the literature on current pricing and external costs than rely on individual decision makers judgement which may be subject to greater variability.

Goodwin also refers to a number of other problems with appraisal that impact on assessment of small schemes, including the qualitative assessment against social inclusion and integration, which is also poorly defined; the role of information provision; the dynamic nature of impacts over time, and the availability of appropriate data. Goodwin notes that the word “integration” has held different meanings (in the transport context) over the years, concluding that the definition implied by the 1998 White Paper “A New Deal for Transport” (DETR, 1998) was the most useful. This definition is defined in terms of “the need for many different instruments of transport policy ... to reinforce each other for the same long term strategic objectives (sic).... That strategic objective is in turn defined entirely in terms of environmental, social and economic sustainability.” Following this, Goodwin concludes that two simple questions are needed, “does the initiative tend to increase or reduce car dependence?” and “If complementary measures [are] necessary, are they in place?” Goodwin also implicitly argues that anything deemed to reduce car dependence will have a favourable impact on all aspects of sustainability, including social inclusion, since improved accessibility for those experiencing exclusion (in terms of access to goods and services that can impact on life opportunities) is an integral part of sustainability. Nevertheless, Goodwin also suggests two explicit questions concerning social inclusion: “who benefits? who doesn’t?” and “have you considered danger of unintended consequences?” It is argued here that some more specific questions may be useful with regard to the various different aspects of integration, and causes of social exclusion. A number of more specific, although not comprehensive, assessment criteria relating to integration and accessibility are already included in the current appraisal summary table (AST), and it is argued here that the appropriateness of these should be assessed and built upon, rather than merging them into a smaller number of potentially more vague questions.

With regard to information, Goodwin notes that current modelling tends to make the same assumptions about information and individual decision making as economists, i.e., that decisions are rational, in the context of perfect knowledge, and a homogeneous world. Since most models are rooted in economic analysis and use principles of equilibrium this is not surprising. Goodwin concludes that given there is no scope to explicitly allow for the impact of imperfect information, it is difficult to attach value to improved information, even if there is real world evidence that better information produces desirable results. Following from this, Goodwin does not recommend any questions explicitly concerned with information, and whilst it’s impact could be assessed indirectly via the questions that are suggested, the research proposed here should consider the need for explicit assessment of information where it is part of project. Indeed, since people cannot make use of new or improved transport facilities if they do not know about them, or understand how they could benefit from using them, one could argue that communications are an essential part of

all projects, and hence that communication should be assessed explicitly in appraisal. Questions that assess whether communications are in line with best practice might be appropriate.

Concerning the dynamic nature of impacts over time, Goodwin alludes to an expectation on the part of decision makers and the public that small schemes will have relatively immediate impacts, and further that these impacts could affect public voting behaviour, and thus local politics. Unfortunately, it is well known that behaviour change takes many years if not decades, as shown by the long running anti-drink driving and anti-smoking campaigns. It would therefore be pertinent to include an assessment of impacts within one year, five years and beyond in the decision making process, although Goodwin does not recommend this. This is perhaps related to the difficulty of making accurate judgements regarding impacts over time, given that many small schemes are too new to have a body of evidence to inform such judgements. How to deal with this issue should be a subject of the research proposed here.

Concerning the availability of appropriate data, Goodwin notes that even now, transport surveys tend to collect more detailed and accurate data regarding vehicle trips than they do for other modes. A classic example cited is collecting data on “walk/cycle” trips, rather than treating them as separate modes. As Goodwin notes, it is clear that poor data will do nothing to help build the body of evidence needed to inform policy development regarding small schemes, especially the impacts over time discussed above. Consequently, one could argue that including high quality monitoring procedures within the design of a small scheme should be integral to all projects, and a key assessment criteria. However, monitoring can be expensive, and therefore this research needs to consider how effective monitoring to support appraisal of small schemes can best be developed.

5.3 Closing Remarks

The material presented here has provided a useful outline and discussion of appraisal of small transport projects. However, the overwhelming impression is that no appraisal presented in the current literature regarding small projects appraisal is directly comparable to NATA. One would not expect non-UK papers to be directly comparable, but it is disappointing that more has not been written in the UK context given the increasingly extensive spread of small projects, and their importance to integrated transport implementation. Perhaps this reflects the complexity of NATA and the fact that the costs of carrying out a full appraisal in terms of time, effort and money would be excessive relative to the scale of the project being appraised, but a level playing field for decisions is needed. Another factor that may be standing in the way of appraisal procedures for small projects is the limited evidence base of the success of newer attitudinal and behavioural measures. Whilst impacts may now be proven for a period of say five years maximum, they cannot be proven in the long term, and regardless, the evidence base is still relatively thin compared to that for major infrastructure provision for example. Thus, one could argue that there is not a full understanding of the costs and benefits of attitudinal and behavioural measures, or their transferability to different contexts. One useful source that draws together much of the existing evidence is the KonSULT database (Knowledgebase on Sustainable Urban Land Use and Transport; www.konsult.leeds.ac.uk). The next stages of this

work will take evidence from KonSULT, and interviews with local authorities to provide a greater understanding of the costs and benefits of small projects, as well as the problems with appraising such schemes, to feed into a desk study, which intends to devise procedures that are as far as possible directly comparable with NATA for testing with selected local authorities. Conclusions regarding the way forward are not drawn here since the interviews with local authorities are fundamental to such decisions, and they are yet to take place, so pre-empting their outcomes would be inappropriate.

6 Distributional issues

6.1 Background

The distributional aspects of appraisal are generally acknowledged as being an important dimension of the appraisal process, both socially and spatially, but there is relatively little guidance or experience of how to successfully build this into an appraisal process.

The focus of this part of Project G is to address this deficiency, by reviewing different approaches to assessing distributional impacts from around the world, proposing methods for incorporating distribution into appraisal, and testing them in several case study applications.

Each of these is addressed, in turn.

6.2 Literature review

The following provides a summary of the literature review that has been carried out.

6.2.1 Concepts and definitions

H M Treasury (2003) describes distributional impacts as a term used to:

“...describe the distribution of the cost and benefits of interventions across different groups in society. Proposals might have differential impacts on individuals, amongst other aspects, according to their:

- Income
- Gender
- Ethnic group
- Age
- Geographical location; or
- Disability”

(H M Treasury, 2003, p. 91)

Litman (2005) provides an overview of the issues that planners should take into consideration when thinking about distributional impacts in the context of transport policy. He characterises distributional impacts in terms of Equity (also called justice and fairness), which refers to the distribution of impacts across the population, and the degree to which that distribution is considered fair and appropriate.

He identifies two types of transport equity:

- Horizontal Equity (also called fairness and egalitarianism), which is concerned with the distribution of impacts between individuals and groups considered equal in ability and need; and
- Vertical Equity (also called social justice, environmental justice and social inclusion), which is concerned with the distribution of impacts between individuals and groups that differ in abilities and needs, for example by income, social class, mobility or access.

In Table 1, Litman (2005, p. 4) summarises a range of variables relating both to impact groups and impact measures.

Table 1 Impact groups and impact measures (Taken from Litman, 2005)

Types of equity	Groups	Impacts	Measurement units
<ul style="list-style-type: none"> • Horizontal • Vertical with respect to income and social class • Vertical with respect to need and ability 	<ul style="list-style-type: none"> • Demographics (age, gender, race, ethnic group, family status, etc) • Income class • Geographic location • Ability (e.g. people with disabilities, licensed driver etc.) • Mode (walkers, cyclist, motorist, bus users etc.) • Vehicle type (cars, trucks, buses etc.) • Industry (truckers, transit, taxis, vehicle manufacturers, etc.) • Trip type and value 	<ul style="list-style-type: none"> • Price or fair structure • Tax burden • Transportation service quality • External costs (crash risk, congestion, pollution etc.) • Economic opportunity and development • Transport industry employment and business opportunities 	<ul style="list-style-type: none"> • Per capita • Per vehicle-mile or kilometre • Per passenger-mile or kilometre • Per trip • Per peak-period trip • Per dollar paid in fare or tax subsidy

Another important strand of work in the US centres on the Environmental Justice movement. Environmental justice was pioneered by civil rights activists concerned that landfills and polluting industries were invariably sited within predominantly black communities or indigenous peoples’ reservations. Consequently there is a major focus with how environmental justice relates to race:

“The goal of environmental justice is to ensure that all people, regardless of race, national origin or income, are protected from the adverse impacts of environmental hazards and to ensure that one group is not disproportionately affected.” (Environmental Protection Agency, 2005)

In the UK, the principal social concern is about how environmental inequality is related to poverty rather than race (Mitchell and Dorling, 2002). There has been several studies that look at the air quality in relation to environmental justice (Pennycook et al, 2001; Mitchell and Dorling, 2003; McLeod et al., 2000), but as Mitchell (2005) points out, these studies sought to assess the current social

distributions of air quality, with little consideration of how these patterns may change in relation to policy intervention.

6.2.2 Measuring distributional impacts

The Green Book (H M Treasury, 2003), the government's best practice guide to carrying out appraisals and evaluations in central government, recommends that:

“Any distributional effects identified should be explicitly stated and quantified as far as possible. At a minimum this requires appraisers to identify how the costs and benefits accrue to different groups in society.” (H M Treasury, 2003, p.91)

It describes three steps when considering equity during appraisal:

1. Firstly the appraisers should analyse how the proposal will affect different groups of people, for example by gender, ethnic group, age, disabled and location.
2. Secondly the researchers should consider whether there are any adverse differential impacts on a particular group and whether these impacts are unfair or unlawful, or contradict Government policy
3. Finally, if a proposal is found not to be satisfactory, remedial action is necessary. Appraisers must consider whether alternative action could meet the objectives without the same adverse consequence; or whether there are any measures that can be taken to reduce the predicted adverse impact.

The Green Book suggests that the impacts of a proposal should be analysed according to the relative prosperity of a household, taking into account demands on household income (e.g. via differences in household size), a process known as 'equivalisation'. Then, the impacts of a proposal should be assessed on different adjusted income quintiles.

One approach to deriving weights described in the Green Book links the amount of satisfaction a household would get from a policy measure with their income. Evidence suggests that as income is doubled, the marginal value of consumption to individuals is halved. In other words, an extra £1 received by someone earning £10,000 a year would be worth twice as much as when it is paid to a person earning £20,000 per annum.

The Department for Work and Pensions (DWP, 2005) also details a method to equalise household income, using the McClements scales. As an example, it compares the circumstances of a single person, a couple and a couple with two children aged four and seven, all with unadjusted household incomes of £100, before housing costs. The process of equalisation gives an equalised income of £164 to the single person, £100 to the couple and £72 to the couple with children.

The United States government provides more comprehensive guidance on how to analyse the distributional effects of transportation projects, in the context of the Civil Rights Act of 1964, which requires that discrimination be avoided on the basis of race, income or national origin.

Guidance produced by the U.S. Transportation Research Board (in ECONorthwest and PBQD, 2002), states that there are three main subcategories that are of concern for policy makers when considering distributional impacts:

- Mode – for example, transit riders compared with other trip makers, with particular consideration of groups with special transportation needs;
- Income and ethnicity – for example, low income groups compared with other income groups; and
- Location – for example, inner city areas compared with suburban areas; one city compared with another.

It then goes on to stress the importance of defining the basis and parameters of distributional analysis, stating that when undertaking evaluations researchers should:

- Define the affected area
- Stratify the population by ethnicity and income
- Define the “general population” or reference area that will be used for comparison purposes
- Choose a concept of “disproportionate”
- Distinguish between populations

In terms of analysis, it proposes that techniques should be largely descriptive (what impacts, on what groups, where?), arguing that co-efficients that have been used to estimate certain aspects of transit benefits and costs are inappropriate for the analysis of distributional effects.

Another set of Transportation Research Board guidance (Forckenbrock and Weisbrod, 2001) recommends a two-step process for analysing of distributive effects:

1. A preliminary screening, in which neighbourhood characteristics and flash points are established, so that the analysis of the project’s effects can be tailored to the circumstances of the community, followed by
2. A secondary analysis, which occurs once these effects have been determined and looks at how they are distributed among the populations and communities affected by the transport project.

The guidebook describes seven methods for examining distributive effects:

- Buffer analysis: examining who lives or uses facilities within an affected impact area;
- Travel demand modelling: looking at changes in travel times and costs across population groups;
- Focus groups, interviews and surveys: to establish residents’ values, attitudes and day-to-day travel needs, at an early stage in the study process;
- Travel diaries: to obtain a detailed record of the current behaviour of different population groups;
- Case study and comparison analysis: a rich source of lessons;

- GIS overlay analysis: using census data, etc. To estimate numbers and types of people impacted by different policy measures; and
- Barrier analysis: looking at severance effects on local communities.

The U.S.A. Transportation Research Board (Forckenbrock and Sheeley, 2004) provides a very comprehensive document on how to estimate the distributive effects of transportation projects in relation to environmental justice. It states that in order to test whether a project distributes the environmental cost and benefits in an equitable manner, three basic steps need to be performed:

1. Identify the affected populations
2. Estimate the nature and extent of the effects
3. Assess whether the effects are equitable

The guidance provides 12 different methods for identifying affected populations:

- Local knowledge and public input
- Threshold analysis using large-area census data – the use of census data to define protected populations on the basis of threshold values for various demographic variable
- Spatial interpolation using small-area census data – use small-area census data to estimate the demographic characteristics of the study area population
- Field study – obtaining local knowledge by travelling around the area and taking notes
- Customer survey
- Population surfaces – a method for processing census data where it is necessary to estimate population characteristics for grid-based model cells.
- Analysis of historical data – useful to assess how issues that have occurred over a long period, or to allow for comparison.
- Population projections
- Environmental justice index – a method for scoring the relative level of environmental justice concerns for census-reporting units based on population density, minority population and low-income population factors
- Activity space analysis using personal interviews
- Activity space analysis using an abbreviated diary – determines what places a given population consistently travels to and the routes that they use
- Space-time activity analysis using GIS – analyses population movement using GIS

The guidebook then goes on to describe methods for undertaking environmental justice assessment looking at the following areas: Air quality, Hazardous materials, Water Quality and drainage, Safety, Transportation user effects, Community cohesion, Economic development, Noise, Visual Quality, Land prices and property values and Cultural resources. The guidebook provides examples of several evaluation methods for each area, with details of how each method can estimate the distributive effects of a scheme.

6.2.3 Data sources

Litman (2005) and ECONorthwest and PBQD (2002) provide some examples of potential data sources that are useful for equity analysis:

1. Government agency budgets and reports that indicate public expenditures by jurisdiction and mode, and on facilities and programs targeted to serve particular groups.
2. Census and surveys can provide the following data, disaggregated by geographic,
 - Demographic, and income category:
 - People's level of mobility (e.g. person-trips and person-miles of travel during an average day, week or year).
 - The portion of the population with disadvantaged status (low income, physical disability, elderly, single parents, etc.).
 - The portion of their time and financial budgets devoted to travel.
 - The problems people face using transportation facilities and services.
 - The degree to which people lack basic access.
3. Traffic accident injury and assault rates for various groups.
4. Audits of the ability of transport facilities and services to accommodate people with disabilities and other special needs.
5. Other local public agencies, such as school districts, housing authorities and health departments may have useful information.

6.3 Implications for examining distributional issues

The literature review provides the main elements of a framework for examining distributional issues, but it is evident that there is not, as yet, a well established, comprehensive and effective methodology for assessing distributional impacts, that can be applied at all levels, from national/regional to the local area.

In broad terms, we are interested in who is impacted how, where and when:

- Who: various groups have been identified, based on age, gender, disability, ethnicity, income, etc.
- How: this is very dependent on the type of problem and policy instrument, but impacts might be in terms of cost, time, air or noise pollution, safety, etc.
- Where: most impacts (except national pricing policies) are spatially localised, both in terms of benefits (e.g. improved public transport services) and disbenefits (e.g. traffic displacement).
- When: this is largely overlooked in the literature review, but impacts may also have an important temporal dimension, due to (i) differences in occurrence by time (e.g. varying traffic levels), (ii) differences in exposure (e.g. due to people being at different places at different times), and (iii) differences in activity participation (e.g. greater sensitivity to noise at night when sleeping).

The literature review also introduces various concepts of equity and justice, that can be explored and operationalised in the Project G5 work. From a cursory examination,

it is evident that there are differences of view, and some contradictions. For example, whether a situation is equitable if two groups experience the same impacts (e.g. noise exposure, or cost increases), or whether this is not sufficient, and it is also necessary to take into account any differences in their ability to absorb that level of impact/exposure.

The review also identifies some methodologies for measuring and assessing distributional impacts. In the main, these are either based on income distributions (usually weighted by calls on that income), or some measures of spatial distribution of impacts. As was noted, there are basic differences of opinion as to whether assessments should be primarily quantitative or qualitative – and data availability at a suitably disaggregate level is a major issue.

6.4 Case studies

Distributional issues are being examined in three case studies within DISTILLATE, that together cover different scales and kinds of policy intervention:

1. Sub-regional transport/land use package, including congestion charging, based in the Bristol sub-region.
2. Sub-district level assessment of Accessibility Planning proposals, based in the Barnsley Dearne area of South Yorkshire.
3. Street corridor level, looking at the impacts of roadspace reallocations scheme options on different user groups, in the West Midlands.

In all three cases, the relevant local authorities have committed resources, in cash or in kind, to assist with the cost of data collection and stakeholder consultation.

The primary focus in each case is on *assessing* distributional impacts, both of current conditions and different options. That is, finding ways of measuring, analysing and conveying information about how different groups are impacted, both spatially and socially. This then feeds into a formal appraisal process, which will be local authority led. Where appropriate, as part of this appraisal we will go on to consider whether differential weights should be applied to different groups or areas.

6.4.1 Sub-regional transport/land use package

This involves the four district authorities in the Bristol sub-region, as part of their TIF (Transport Innovation Fund) funded work. The links with DISTILLATE were mentioned in their successful bid to DfT.

The authorities are committed to exploring how congestion charging and other traffic restraint measures might form part of a package of measures to address problems of congestion, air pollution, etc. and improve the accessibility of disadvantaged groups to employment, etc. DISTILLATE is working with the authorities to develop and apply a methodology for assessing the distributional impacts of different proposals; work started in July 2006.

Consultants are being employed to carrying out much of the work, under guidance from the client. DISTILLATE is part of the client team, so ensuring that the work is

relevant to addressing DISTILLATE requirements. The broad approach to assessing distributional impacts is being set down by DfT, and DISTILLATE is represented at these meetings, alongside Bristol (as lead local authority partner).

The main stages of the work include:

1. Mapping out current conditions (both exposure to negative externalities and to transport opportunities) in relation to the location of different disadvantaged population groups.
2. Examining travel patterns of disadvantaged groups, and their flexibility to adjust to road pricing charges (incorporating a social survey instrument being developed by DfT).
3. Examining to what extent distributional impacts can be output from the travel demand and traffic assignment models being used in the sub-region.
4. Considering how the needs and concerns of disadvantaged groups can be included in road pricing scheme design and associated mitigation measures.

6.4.2 Sub-district level Accessibility Planning proposals

Working with South Yorkshire PTE, the Barnsley District of South Yorkshire is developing a Local Accessibility Implementation Plan for the ex coal mining area of Barnsley Dearne. A programme of stakeholder consultation has already identified a range of problems and issues to be addressed, and Project B will be playing a major role in developing wide-ranging accessibility options. These will include changes in land use provision, mobile services and tele-services, as well as improvements to conventional and unconventional public transport services.

This will be complemented by work in Project G5, to look at the distributional impacts of current conditions and the options that are generated. This work will need to take into account the varying activity needs of different population groups, as well as the extent to which they (dis) benefit from each proposal, and whether there are any knock-on effects, both positive and negative. There is likely to be a strong spatial dimension to this analysis, which is being captured in a GIS-based approach, with extensive inputs from SEI.

Preparatory work began in May 2006, and a programme of focus groups and public workshops is planned between October 2006 and March 2007, including workshops with the agencies providing services of relevance to accessibility planning. The work on distributional issues will be carried out alongside the Project B (problem identification and option generation) work, and then brought together in a further stage of analysis and reporting. It will involve both UoW/UCL and SEI.

SYLTE and Barnsley Council are contributing to the costs of setting up and running the workshops and focus groups.

6.4.3 Roadspace reallocation

Local authorities are increasingly developing proposals for roadspace reallocation, both in response to transport policy agendas that encourage modal shift, and public realm agendas that encourage a much broader use of public spaces, including streets.

This work is focusing on the more major ‘arterial streets’ in an urban area, referred to by DfT as ‘mixed use main roads’.

Project B will be developing tools for assisting in the generation of street design options that take into account the needs of the different street user groups. Project G5 will complement this, by looking at the impacts of design options on all kinds of street user groups, defined according to their general relationship to the street (local resident, local business, employee, visitor, etc.), the modes of transport used to access or pass along the street (e.g. van driver, bus passenger, cyclist), the activities carried out in the street (e.g. shopping, social meeting) and any characteristics of individuals that may influence needs or their ability to interact freely with the street environment (e.g. age, gender, ethnicity, disability).

The work is being carried out in Bloxwich, on a radial route into Walsall, in the West Midlands. Design workshops with residents and local businesses are planned for late October 2006, using both physical and computer-based design tools. The local authority will then consider the outputs of the workshops, and develop one (or more) options for formal public consultation, in February/March 2007.

Project G5 will identify all the relevant local street user groups, and map the extent to which – and ways in which - each option generated in the design workshops benefits or disadvantages different groups. It will also consider issues such as the weighting that might be given to the concerns of different groups.

Walsall Council is contributing to the costs of running the public design workshops, and further developing computer software (developed by Buchanan Computing) as part of Project B, with the aim of subsequently using the methodology in other sensitive areas as part of developing a Red Route network for the West Midlands.

Both Bristol and Merseytravel have expressed interest in providing a comparator site in 2007, once the Bloxwich work has been completed.

6.5 Research outputs

Four research outputs are planned for G5:

1. Literature review on distributional issues (November 2006)
2. Report on Bristol sub-regional study (Autumn 2007 – subject to timing controlled by DfT and Bristol)
3. Report on Barnsley Dearne case study (September 2007)
4. Report on Bloxwich case study (June 2007)

If agreement is reached on a comparator case study for main road space reallocation, in Bristol or Merseyside, then there will be a fifth report, around October 2007.

In addition, it is probable that each report will generate a journal article, and the whole set of work might be suitable for publication as a book.

7 Political and practical considerations

Previous sections have covered the technical issues relevant to appraisal. This section covers a separate set of issues that need to be taken into account when considering the use of appraisal, that is the way it is actually used in practice.

Aside from the purpose to which appraisal is put (i.e. decision support or decision making), there are two main spheres of influence which impinge on the use of appraisal and appraisal tools. They are:

1. The political context, which is influenced by:
 - Assumptions about what appraisal is & where it should be used within the policy cycle.
2. The policy context, often influenced by what social scientists call ‘bounded rationality’ (after Herbert Simon’s work, e.g. see Elio 2002) which include certain boundaries and boundary markers such as:
 - Knowledge/experience/skills,
 - Actual use of appraisal,
 - Time,
 - Finance,
 - Assumptions about the political context,
 - Assumptions about what appraisal is & where it should be used within the policy cycle.

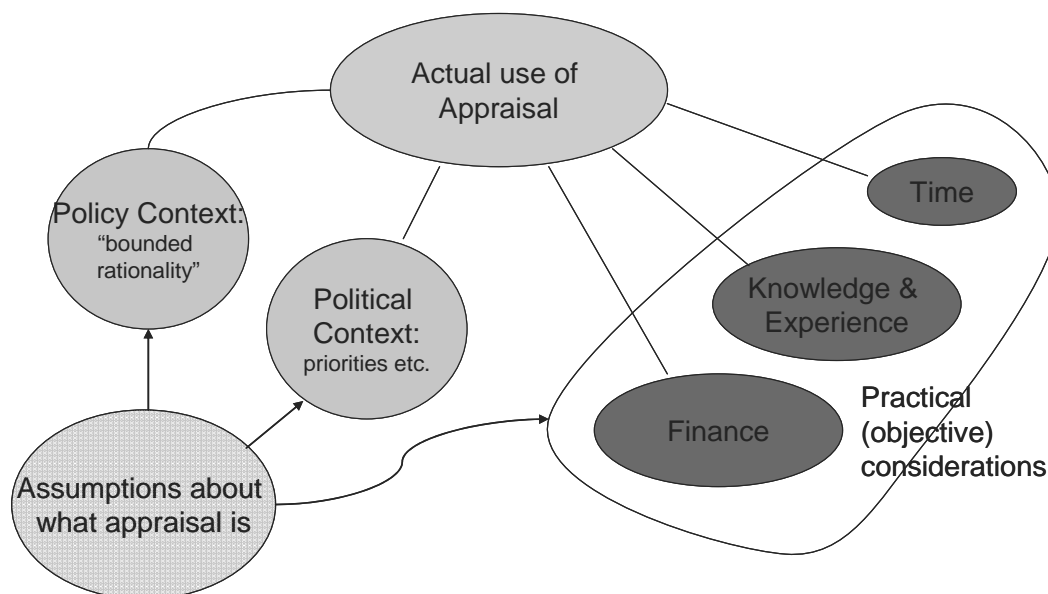


Figure 5 The interlinkages of political and practical considerations within appraisal

In trying to open up the Pandora’s Box of why people make the decisions they do, Weiss (1979) provides a summary of the different explanations of research [evidence] utilisation:

- The knowledge-driven model, whereby the impetus for policy-making originates within the research community.

- The problem-solving model, in which the policy agenda shapes research priorities.
- The interactive model, suggests a complex relationship between research and policy-making. A small, close-knit and stable group of public officials and pressure group representatives interact on a regular basis within a particular policy arena.
- The political model, describes the process of policy-making as being politically driven, as when policy-makers use commissioned research to support a position already taken by the government.
- The tactical model, research as a delaying tactic in order to avoid responsibility for unpopular policy outcomes
- The enlightenment model, research is distanced from policy-making and has an indirect rather than a direct influence on the policy-making process. Research helps to inform rather than to shape the policy-making process.

The knowledge driven and problem solving models follow a rationalistic approach to decision making and on the whole occurrences of this model are considered to be quite limited. The political and tactical models imply a political view of the policy process and the use of evidence (Nutley et al 2002: 29). At a day-to-day level, the interactive model is the most convincing given changes in the public sector over the last 20 years (increased number of actors involved in policy decisions, fragmentation of the public sector, the role of policy networks etc.).

Some of these models are more relevant to this project than others because some focus on how pre-existing research evidence is used within policy making (assuming a degree of separation between the two), as opposed to how policy makers procure and utilise evidence in using more ‘objective’ decision support tools such as appraisal methods.

Policy makers make decisions within the confines of ‘bounded rationality’(after Simon, see above), i.e. there are limitations to capacity which include:

- Psychological constraints (knowledge, skills & values), and
- Organisational constraints (over-specialisation, lack of information and departmentalism).

Rooted in this approach, Figure 5 outlines the institutional context within which we feel that evidence-based policy is likely to occur. It is important to remember that, when we’re dealing with multi-stakeholder engagement and the wider institutional context (see Figure 6), one person’s process is the other person’s tool or outcome. Thus, for transport planners and professionals, transport is the process, but for health or educational professionals – or, indeed for shopkeepers, transport is not the process but only a tool which is used by them as a means to an end.

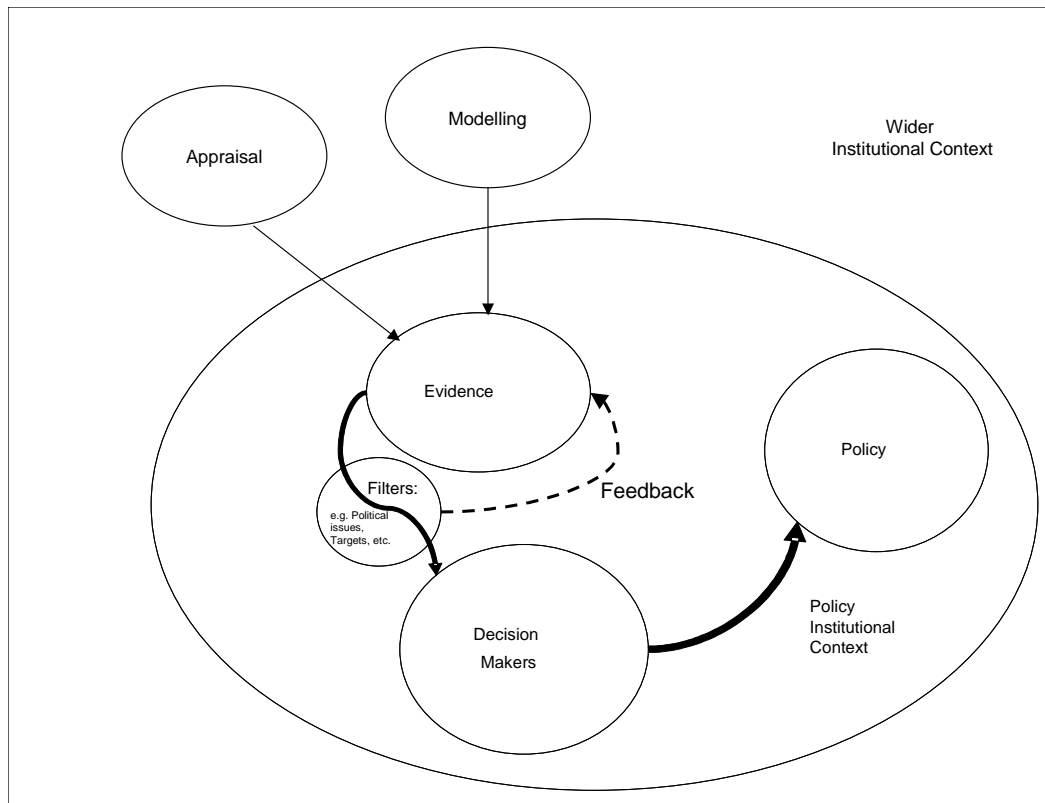


Figure 6 The institutional context within which evidence-based policy is likely to occur

Thus, as Figure 6 shows, appraisal is only one of the inputs to what might be termed evidence by policy makers. Further, filters such as political issues and a target-based approach to policymaking (*e.g.* coming out of LTP2 commitments) produce a feedback loop to skew evidence. This is complemented by the findings from the DISTILLATE Scoping Study (see Hull *et al*, 2004) and outputs from Project A. The Scoping Study identifies some of the barriers between tool developers, tool appliers/users, and the users of the outputs of the tools: respondents mentioned the lack of accurate techniques to assess various policy initiatives. The Scoping Study further finds that there is a perceived inadequacy or lack of standards and guidance particularly on coding standards for ‘softer’ interventions. Another respondent argued that the NATA appraisal is biased in favour of car-based developments. Tools were seen ‘not to come up with the right answers’ and so are often discounted or remain unused to the fullness of their capacity. These issues will be explored in our Project G casework using the objective tree shown in Figure 7 to follow up these issues in several cases.

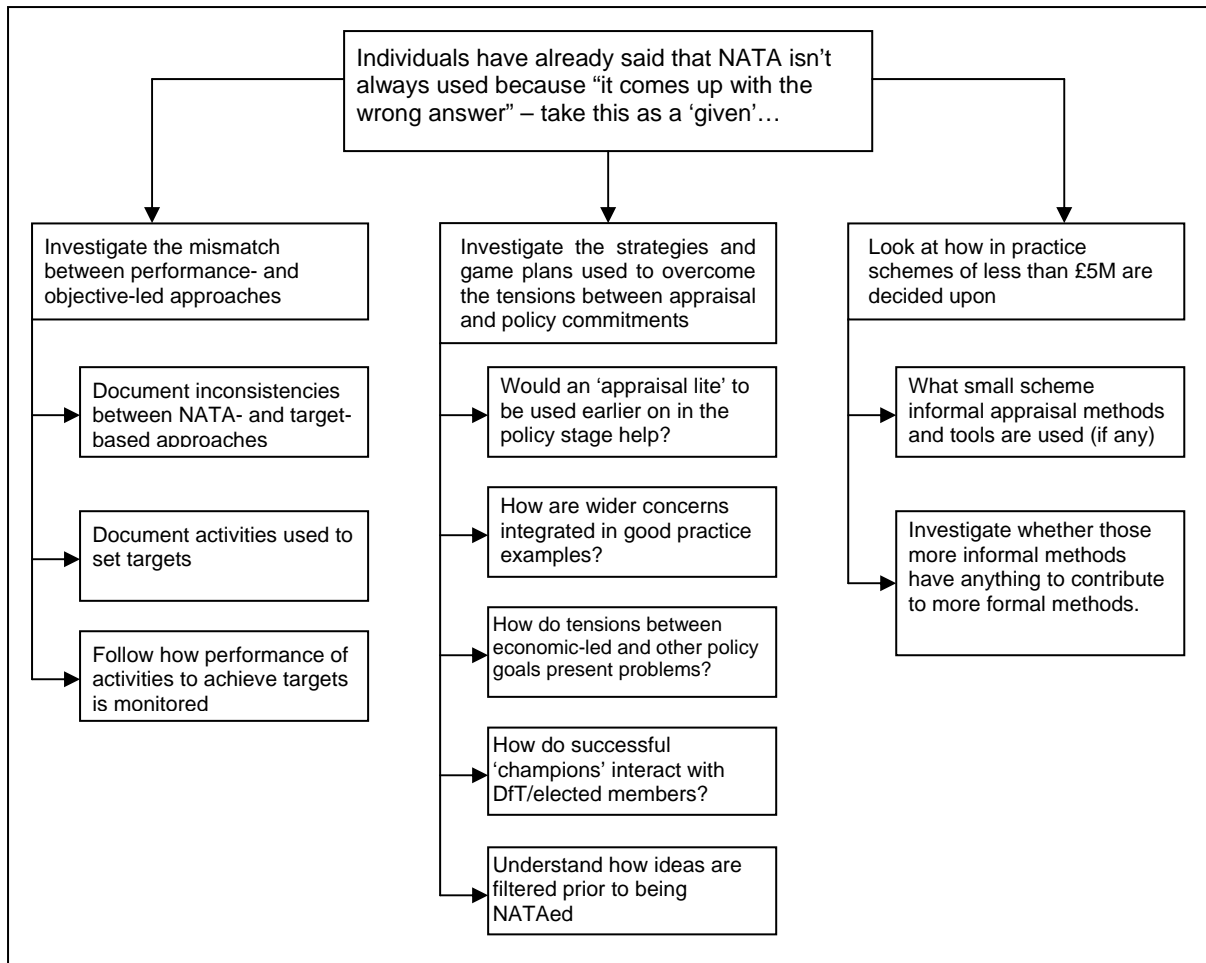


Figure 7 The ‘objective tree’ for case work to address the concerns on political and practical considerations

This will provide an interesting insight into the actual use of appraisal, and assumptions about what it is. An underlying assumption is that appraisal (and modelling) isn’t always used to *facilitate* the decision making process. Whilst methods of appraisal may have been developed in order to rank different options against each other, instead, they are sometimes used to provide the evidence to support the ‘right’ answer. This points towards the politicisation of such tools. Thus, within the context of the objective tree above, we will explore:

- What is the ideal role for appraisal in terms of policy development?
- How is appraisal – and appraisal tools – currently being used and why?
- And, to go back to Figure 5, what is the relationship between the policy, political and practical contexts and how can these three be made to function ‘better’ within the context of appraisal and decision making for the delivery of sustainable urban environments.

8 Conclusions

There are a number of general conclusions arising out of the material presented in the different sections above:

It may be possible, given the opportunity that DISTILLATE presents, to develop an initial/outline appraisal methodology which becomes more of a process which is pursued through the lifetime of the project, rather than a technically challenging and expensive “hurdle” that a proposal has to overcome towards the end of its development. This is product G1 (below).

There should be more recognition of the issues and potential conflicts between policy making (including setting objectives and targets, developing strategies and choosing instruments) and VfM as defined using some form of appraisal. These conflicts should be made more open so that decision making becomes more transparent and the reasons for any choice between the “best” solution (as suggested by an appraisal) and the best policy “fit” are clear. This is product G4 (below).

There is a clear opportunity for DISTILLATE to develop appraisal methods for small schemes and behavioural and attitudinal measures. These may be different from the procedures developed for larger schemes because they should be proportionate to the size of the project being undertaken. It is hoped that such procedures will help to put such schemes of a “level playing field” compared to larger schemes. This is product G2 (below).

There is also a clear opportunity to develop methods for assessing the distributional impacts of schemes as part of appraisal. This is product G3 (below).

It is crucial to study the political and practical issues associated with appraisal in order to understand how it is actually used in decision making and therefore how appraisal procedures can be improved. This has implications for the development of more transparent appraisal techniques and a clearer recognition of the inherent conflicts in decision making. This work will inform the development of all the products and feed into product G4 in particular.

8.1 Products from Project G

G1: A method for initial outline appraisal of schemes and strategies

One of the problems that local authorities encounter when using traditional appraisal methodologies is that they require a large amount of data and effort and therefore tend to take place at the end of an extended period of project development. It is therefore difficult for the results from appraisal to be taken into account in decision making and scheme design at an early stage. Similar problems arise in the early stages of appraising an overall strategy. This output will be a method for conducting an outline appraisal at an earlier stage in the development of a project. It will be based on NATA and will therefore have results which are (as far as possible) comparable, but will

have less onerous data requirements and be less time consuming to perform. As such it should indicate to a local authority how a project might score under NATA and whether it will have a favourable VfM. It will not solve the problem of possible conflict between appraisal results and the policy that a local authority wants to pursue but will make this clearer at an earlier stage in the decision making process.

G2: An appraisal method for small schemes

Appraisal techniques for small schemes and for attitudinal and behavioural measures are not particularly well developed. This output will be a methodology for appraising such schemes, so that they can be compared with larger schemes, their value for money can be assessed and prioritisation made between such schemes. The techniques used will have to be less onerous than traditional appraisal methods and may include greater consideration of impacts which are not given much emphasis in larger schemes. However, under current rules the appraisal requirements for such schemes (<£5M) are much less rigorous, so this methodology will be free to use a wider variety of different techniques.

G3: Tools for representing and appraising the distributional impacts of policies

While DfT and Treasury guidance both stress the need to take into account distributional issues in project appraisal, there is little detailed information on how this might be achieved in practice. Based on case studies in Bristol (road user charging), Barnsley Dearne (accessibility planning) and the West Midlands (roadspace reallocation), the tools that are being developed will illustrate: (i) how to identify the relevant stakeholder groups in different contexts, (ii) how to measure current conditions and the likely impacts of policy measures on different groups, and (iii) how the subsequent appraisal might take into account the differing circumstances and concerns of these different groups.

G4: A review of ways of overcoming the inconsistencies between targets and appraisal

One of the barriers identified by local authorities was the potential for inconsistencies between the transport policies to which they aspire, those which appear best to satisfy externally driven targets, and those which perform best in terms of NATA or Value for Money. These inconsistencies could potentially be resolved by aligning the indicators used, their relative weights and the target values with the criteria used in appraisal, or by setting targets to be consistent with the outcome of strategy appraisal. The review will consider such possible solutions, making clear the advantages and disadvantages of each. The aim will be to increase the consistency and transparency with which decision making is carried out. Transport Scotland has also raised the question of identifying decision points and audit requirements in the appraisal process. It might be that this product could also provide guidance on this.

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