

Small & Local Scheme Assessment Tool

DISTILLATE

Tool and Method Report

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Version 1:
March 2008



Executive Summary

This report presents the development and testing of a tool designed to support the decision making process for small and local schemes that do not have to proceed through to a full NATA¹ appraisal. It is also intended that it could be used with larger schemes to provide an initial indication of whether they are worth pursuing to the full appraisal stage.

The small and local assessment tool allows users to select a set of indicators appropriate to their circumstances, weight the indicators in terms of importance, assess the impact of proposed project(s) against the indicators, and finally combine the weighting and assessment to derive a final score that will give an indication of whether a project is worth pursuing, or a priority list where more than one project is assessed. Packages of measures can also be assessed. A pick list of potential indicators is provided derived from the NATA appraisal, Local Transport Plan guidance, UK Best Value Performance indicators (BVPI) and other appropriate sources. Users are also able to add in their own local indicators to the assessment.

The small and local scheme tool is an MS excel (.xls) file. It is currently available on request from Charlotte Kelly (c.e.Kelly@its.leeds.ac.uk) or Ann Jopson (a.jopson@its.leeds.ac.uk)

The tool is supplied with a large range of indicator sets appropriate to transport and land use decision making for practitioners to source from.

¹ NATA is the New Approach To Appraisal - full details are available at <http://www.webtag.org.uk/>

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1 Introduction

This report describes one of the activities of the DISTILLATE research consortium in the area of appraisal. The principal objective of DISTILLATE was to develop, through a focused, inter-disciplinary research programme, ways of overcoming the barriers to effective development and delivery of sustainable urban transport and land use strategies and, through them, enhanced quality of life. The consortium was initially set up with 16 local authority partners who would provide case studies and support for this work.² One of the first activities of the DISTILLATE research consortium was to conduct a detailed survey of the local authority partners to assess the barriers that they faced in developing and delivering sustainable urban transport and land use strategies (Hull and Tricker, 2005).

The small and local scheme assessment tool arose from the need from practitioners for a procedure to 'appraise' local and small schemes at the decision making stage. Through consultation, the initial consortium surveys and interviews carried out for this report, local authorities expressed a need for a formalised procedure to support decision making for schemes that fell below the thresholds of conventional appraisal specified by DfT for larger schemes. Small and local scheme decisions were in some cases based on little evidence regarding the most effective project, but instead were taken in response to campaign groups and/or offers of match funding. Authorities have tried to develop their own assessment tools to suit their own purposes, so far with little degree of success. Some authorities used quick 'tick box' assessments, but these were not ideal for comparing different options. Some authorities use 'black box' assessment tools from consultants but these are often neither designed to meet the specific needs of an authority nor transparent even to authority officers who are using their outputs (see section 2).

The small and local scheme assessment tool is an assessment matrix which allows users to select a set of indicators appropriate to their circumstances, weight the indicators in terms of importance, assess the impact of proposed project(s) against the indicators, and finally combine the weighting and assessment to derive a final score that will give an indication of whether a project is worth pursuing, or a priority list where more than one project is assessed. Packages of measures could also be assessed. A pick list of potential indicators is provided. These indicators are described in full in section 4, and include indicators from the NATA appraisal, Local Transport Plan guidance, UK Best Value Performance indicators (BVPI) and other appropriate sources. Users are also able to add their own local indicators – these may reflect specific local issues.

Guidance on selecting indicators, weighting and assessing the impact of projects is provided to accompany the matrix. Likely users include local authority decision makers, although the matrix could also be used as part of the consultation processes with stakeholders. In the first instance the matrix is designed to support the decision making process for small schemes, but it is also intended that it could be used with larger schemes to provide an initial indication of whether they are worth pursuing to the full appraisal stage.

² Full details of the consortium are available at www.distillate.ac.uk

This report now describes the case for the tool in section 2, a review of some of the current appraisal methods used in transport in section 3, the development of the small and local scheme assessment in section 4, an example assessment in section 5 and the results of testing the tool and further work in sections 6 and 7.

2 The case for a small and local assessment tool

At the start of the DISTILLATE project a survey was conducted of the local authority partners to identify what barriers they faced in developing sustainable urban transport and land use strategies. The full results of this survey are presented in Hull and Tricker, (2005) and Hull et al., (2006). This survey identified that local authorities had concerns about appraisal practice and perceived that current appraisal procedures were one of these key barriers. Interviews conducted alongside this survey identified five key barriers to appraisal, which can be summarised as (described in full in Page et al, 2007):

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
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.

The small and local scheme assessment tool described in this report has been developed in line with barriers 3 and 4 and in doing this it has aimed to provide a potential solution to the following barriers:

- Appraisal methods appropriate for the assessment of schemes for small projects (<£5m) are not well developed for certain policy instruments (e.g. soft measures like the effects of publicity campaigns)
- The procedures for appraisal can be time consuming, onerous and expensive. Therefore there is a reluctance to carry out a formal appraisal where either it is not required or a project has not been sufficiently well developed.

The starting point for this work was that there is currently no concrete guidance for local authorities on how to prioritise/ appraisal schemes that do not fall into the category of requiring a full NATA appraisal (>£5 million). However, the Department for Transport Guidance does state that whilst a full project appraisal is not needed for projects that do not fall into the categories listed below, the NATA procedures should be taken as good practice (DfT, 2004a):

- “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”.

Therefore there is an expectation of some form of appraisal at all levels of government and all types of schemes. This is further emphasised by the guidance given to local authorities on the production of their second Local Transport Plans (LTP) whereby authorities were required to identify the “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, 2004, p45).

Towards the end of this work two other key reviews have considered this potential barrier involving the appraisal of small and local schemes and the need to ensure that appraisal is balanced between presenting enough information while not being onerous, time consuming and expensive. The first is the Department for Transport who is currently³ consulting on a review of the New Approach to Appraisal (DfT, 2008). Three of the key questions that they are considering are:

1. *The need to ensure proportionality of appraisal effort is noted in NATA, but users suggest that in practice the burden appears to be on the excessive side. How might we support promoters and analysts so that appraisal is proportionate*
2. *If there were a light touch appraisal, how should sufficient robustness be maintained?*
3. *In the future option generation is likely to be more complex, integrating for example small scale and better use options. The range of alternatives considered including some possibly rejected at an earlier stage may be informative to decision making. How might this information be presented? (p77).*

These are some of the key questions that the development of this tool has considered and further confirm the importance of this area of work. The results of this consultation will be published later in 2008. Atkins Transport Planning produced for the Department for Transport a guidance document on the prioritisation of smaller transport schemes (Atkins, 2008). They identified that “there is little specific guidance or advice on how authorities should prioritise their smaller integrated transport schemes typically less than £250,000...”They also identify that there is a need for all authorities to “develop and implement more systematic methodologies for option generation and budget allocation” (*ibid*).

The development of the framework for this small and local scheme assessment tool was informed by a number of sources. Firstly, a literature review on appraisal in the UK, which considered small and local scheme appraisal (Page et al, 2007) was conducted as part of the DISTILLATE appraisal work. Detailed interviews were then conducted with transport officers at Merseytravel and the tool was consulted on at the various DISTILLATE workshops in which the proposed tool was presented. The literature review identified again that “there are no specific procedures guiding decision making for small scheme” (Page et al, 2007, p32). The interviews and workshops provided more detailed evidence on what were the key issues in developing the tool and what problems local; authority officers were currently facing, which will now be discussed.

³ At time of writing report (March 2008)

It was identified that there were a number of authorities who were developing prioritisation methods. Examples from Somerset and Kent are provided in section 3. Atkins (2008) also reviews a number of other methods used by other authorities. As described previously it was identified that there was little guidance available for how to do this.

Problems that authorities were facing in doing this were whether to assess projects purely based on whether they help to achieve a certain target or whether they are a 'good scheme' as a whole. One authority stated that "we're trying to decide what is best to do it on a scheme by scheme basis and have a framework for assessing it or on a target by target basis and have a framework for assessing it". One (Unitary) authority officer described the current dilemma as: "once you've decided what you're going to do and where you're going to do it how do you evaluate the worth of what you've decided to do?" Value for money (VfM) is always important, at local as well as a national level. Another authority stated that they needed a tool that would allow them to justify to the decision makers the value of some of the smaller and more local schemes.

A range of in-house and consultant developed models were being used. One of the problems identified was that in some cases the methods used to assess the schemes were black-boxed leading to little transparency between the inputs and outputs. Interviews with one unitary authority indicated that the officers did not understand how the tool that was being used was producing the outputs, given how unrealistic they seemed. Other in-house assessment methods were found to use a multiplicity of spreadsheet assessments, overburdening the process. In addition to this some authorities were using simple 'tick box' box assessments which provided little support for comparing projects against each other. At one of the DISTILLATE workshops it was identified that "organisations need to understand what each other is doing [and why]". More high quality – and transparent – data and assessment tools are required to produce the evidence base for joint working.

Duncan Price (DfT), has noted recently⁴ that future LTPs will be bound less by assessment. If this is the case, one can hypothesise that the need for nationally set targets will be less and the need for locally meaningful targets which engage stakeholders will increase. More open and transparent assessment (*i.e.* appraisal) of LTP strategy and schemes included in LTP will become necessary. Price also notes the need to work with other sectors particularly in view of central government's *Local Government White Paper* (& Bill) that emphasises 'shared priorities', again suggesting the need for common (or 'participatory') assessment. This highlights the need for the tool to be flexible and include impacts to a range of sectors.

The key outcomes from this consultation were a need:

- to be able to weigh schemes and projects against targets (local and national)
- to be able to include all "types" of schemes in the assessment
- to be able to compare the 'value' of projects and schemes directly
- for the process to be transparent, not be onerous and not expensive
- for a "lighter touch" appraisal than the full NATA assessment (but still containing the essential information for decision makers).

⁴ At the Transport Practitioners' Meeting (TPM), Manchester, July 2007.

Interviewees were asked about the benefits of a small scheme assessment tool at the various workshops. The development of such a tool was received in positive terms, although it was also considered to be very difficult to develop. We had a number of comments regarding the tool, and one particularly apposite one is quoted verbatim below:

“I mean you’re chasing- you are chasing the holy grail here ... been looking for years and years to be able to find some way of assessing schemes against each other...how do you prioritise between the bus priority measure, a street lighting job, or you know a bus station....Well I’m right behind you”.

3 Review of UK transport prioritisation methodologies

Prioritisation methods are currently applied at all levels of transport planning in the UK. This section will consider a range of methods that are currently used to prioritise the transport options to implement, with a view to informing the local and small scheme appraisal method. Examples are provided at a National, Regional and Local level.

3.1 National Prioritisation process

There are two main methods that are applied nationally to transport projects in the UK. The first is the New Approach to Appraisal (NATA) which is applied in England and Wales and the second is the Scottish Transport Appraisal Guidance (STAG) in Scotland. Both will now be described.

3.1.1 New Approach to Appraisal (NATA)

The New Approach To Appraisal (NATA) was introduced by the Department for Transport (DfT) in 1998 in order to provide assistance in, prioritising between proposals and assessing value for money. The guidance is documented in the DfT's WebTAG documents (DfT, 2004). NATA has evolved since its introduction and is now the basis for:

- Appraisal of multi-modal studies
- Appraisal of schemes > £5million
- Appraisal of Highway Agency road schemes and Local Transport Plans major road and public transport schemes
- Appraisal framework for seaports
- Appraisal framework used during the development of the government's airports strategy.

The Department for Transport is currently consulting on a review of this method. The key questions that are being considered can be found at DfT (2008).

NATA represented a major change from the traditional Cost Benefit Analysis (CBA) approach to assessing the total costs and benefits from a project. CBA was 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.

Figure 1 illustrates an overview of the DfT transport analysis process. The appraisal tools fit into section 7 of the process and the appraisal framework section 6.

The NATA appraisal framework is made up of:

1. 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),
2. Achievement of regional and local objectives (step 6.2),
3. Effectiveness of problem solving by the options (step 6.3), and
4. Supporting analyses of distribution and equity, affordability and financial sustainability, and practicality and public acceptability (step 6.4).

It is suggested 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 refers to a single proposal compared with a "do minimum" or "do nothing" alternative. It is required that an AST be produced for all strategies that are being compared.

The balance in the AST of all the significant costs and benefits gives the 'overall net value' of the option. It takes account of all factors (not just economic worth) and it considers all kinds of impacts (both monetised and non-monetised, and qualitative and quantitative). The overall net value is derived by judgement; therefore different people might have different conclusions about the overall net value of an option, depending on the weights they attach to the impacts. Indicators such as the BCR (benefit cost ratio) and NPV (net present value) are used to help inform decision makers about the monetary benefits of the scheme and to assess whether the proposal meets DfT and government objectives and offers value for money.

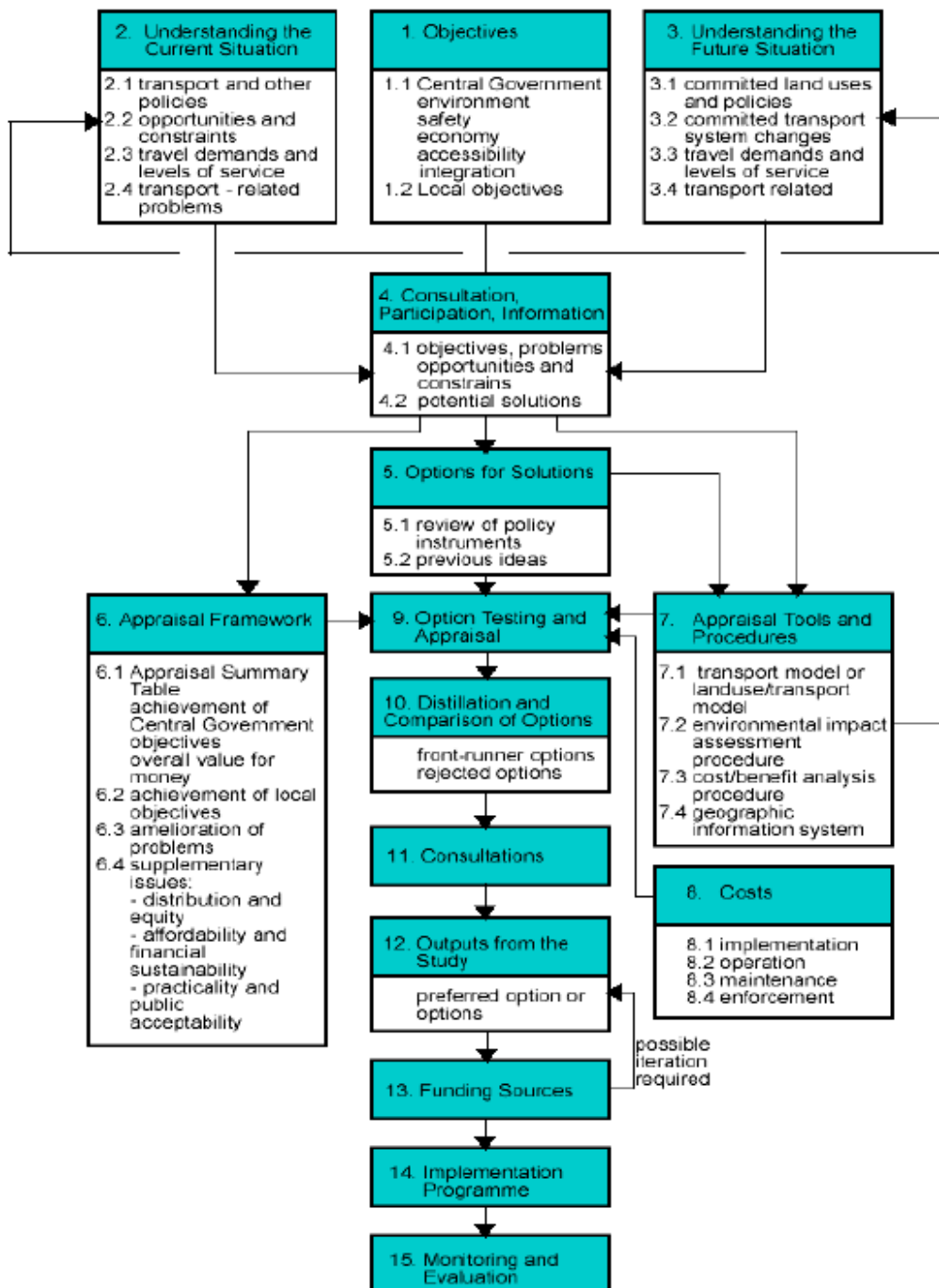


Figure 1 Overview of the transport analysis process (source: WebTAG Unit 2.5, DfT, 2004)

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

Option		Description	Problems	Present Value of Costs to Public Accounts £m
OBJECTIVE	SUB-OBJECTIVE	(a) QUALITATIVE IMPACTS	(b) QUANTITATIVE ASSESSMENT	
ENVIRONMENT	Noise			net properties win / lose NPV £m
	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			PVB £m
	Security			Score
ECONOMY	Public Accounts		Central Govt PVC, Local Govt PVC	PVC £m
	Business Users & Providers		Users PVB, Providers PVB, Other PVB	PVB £m
	Consumer Users			PVB £m
ACCESSIBILITY	Reliability			Score
	Wider Economic Impacts			Score
	Option values			PVB £m
	Severance			Score
	Access to the Transport System			Score
INTEGRATION	Transport Interchange			Score
	Land-Use Policy			Score
	Other Government Policies			Score

NATA has set guidelines for sensitivity testing to assess what would be the likely result for the BCR if any of the inputted values in the AST were to be under- or over-estimated (DfT, 2004). These include testing to see what would happen to the BCR if the operating costs were higher than expected and the level of patronage at which the net benefits of the scheme are zero.

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.

While it is not a requirement for NATA to be used for projects under £5 million at a local authority level there was an expectation that the local authorities would follow the basic NATA objectives in Figure 2 when assessing the magnitude of the effects of their Local Transport Plans that were submitted in 2007.

3.1.2 Scottish Transport Appraisal Guidance (STAG)

STAG is a document to aid transport planners and decision makers in the development of transport plans programmes and projects. STAG (Scottish Executive, 2006) breaks the appraisal process down into two parts, the first of which is a prior/initial appraisal. The second is a detailed appraisal against the government's objectives. This 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 a more comprehensive appraisal is conducted. 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.

The second part is the main appraisal within STAG and is completed after developing the proposal and more detailed investigation of its potential positive and negative impacts. A completed Part 2 appraisal is required when final approval or funding is required from the Scottish Executive. This appraisal includes the following elements carried forward from the Part 1 appraisal:

- The proposal details and background information, which will largely replicate and update the information provided in Part 1;
- An updated assessment of the proposal's performance against the established planning objectives, which at this stage should include quantified information against each planning objective; and
- An updated and more detailed implementability assessment, reflecting any work done to test feasibility, seek the views of the public or the publication of new policy documents relevant to the proposal.

3.2 Regional prioritisation process

In recent years there has been a change from a National/Local planning structure to a National/Regional/Local planning focus. In late 2004 the Treasury signalled that it would provide "the English regions with indicative long-term regional funding allocations (RFA) for the 10 year period to 2016" (Beswick et al., 2006) in the areas of transport, housing and economic development to assist them in progressing their regional strategies. Each region was required to develop a prioritisation methodology to allocate this money. 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,2006a).

The methodologies that the regions developed resembled each other and used scoring systems to assess each scheme's contribution to the region's objectives (policy fit) as well as assessing value for Money (VfM) and deliverability. However, the derivation and presentation of these dimensions was different for each of the regions (Beswick, et al, 2006). The methodologies used were designed to inform decision makers rather than make the decision for them. The approach taken by regions has had a big influence on how transport schemes are funded. All the English regions had to devise a methodology that identified an objective-led, clearly prioritised set of transport investment and management interventions. Independent consultants were employed by the regions to make sure that their methodology was objective and free from political, institutional and geographical bias. A unique methodology was developed by each region to prioritise transport schemes, and this methodology allowed regions to fit into their own circumstances and integrate their own regional priorities rather than using a one size fits all method. The section below gives a description of the scheme prioritisation method developed for the Yorkshire and Humber region.

3.2.1 Yorkshire and Humber region

Yorkshire and Humber developed a two tier arrangement for the decision making prioritisation process which included the Regional Transport Board (responsible for the strategic direction and agreement of the recommendations) and the Management Analysis Group (MAG) (responsible for managing and implementing the work programme). JMP Consulting (Beswick et al, 2006) was employed to work on the methodology. The approach is illustrated in Figure.

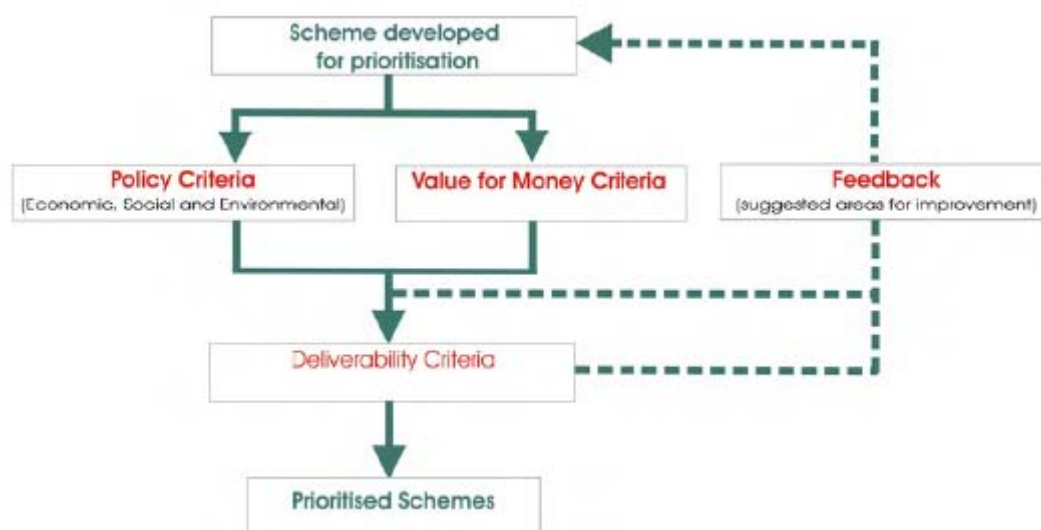


Figure 3 Yorkshire and Humber Regional prioritisation methodology
Source: Beswick et al, (2006)

Figure 3 shows that the prioritisation of policies depends on meeting the policy criteria for the region (economic, social and environment), VfM criteria and deliverability criteria. If these are not met then the policies are sent back for feedback and to be redeveloped.

The policy criteria were derived from regional policies. It was decided to restrict the number of policy criteria to 15 in order to focus on the key regional issues (Beswick et al 2006). For each of the schemes being assessed the policy criteria were scored against a seven point scoring scale (-3 to +3) with zero representing no impact. The sum of these scores gave the score for each scheme against policy criteria.

When the methodology was being developed the issue of whether it would be beneficial to be able to put a different weighting on the three policy criteria areas (economic, social and environmental) was investigated. Ten sample schemes were tested using the weighting score formula shown below. The testing involved all possible permutations where a, b, c equalled combinations of 1, 2 and 3. The result of this testing was that they found that the same schemes tended to score better in the assessment regardless of the weightings imposed. It was decided from this not to weight the scores and to rely on the 15 key regional policy criteria as a judge of which regional issues were most important. Beswick et al, (2006) found that when looking at what was done in all regions generally, some regions did some sensitivity testing involving weightings of criteria, but did not find that weightings significantly affected the identification of priorities.

Weighting score = a (economic policy score) + b (environmental policy score) + c (social policy score)
(Where a, b and c are the weights applied)

For the scoring process, evidence for each scheme was collected from the scheme promoters. Two independent appraisers assessed the schemes and produced a set of scores but no overall score was produced. A scoring meeting was held where a single set of scores for each scheme was agreed. If there were differences between the two original assessments, the information was reviewed to reach a score and scores were not averaged. The peer review looked at a number of issues, such as the scale of scores given and the true reflection of scheme impact in that scoring; presentation of scores (especially negative scores in environmental terms); presentation of broader scheme information and context; the information available for scoring and to identify further work, and specific circumstances for some schemes. The final scores were then circulated to the scheme promoters for comments (Beswick et al, 2006).

The value for money criteria (VfM) was based on the benefit cost ratio (BCR), as defined by the DfT guidance and DfT guidance on VfM (see DfT, 2006b). The BCR used was supplied by the scheme promoter and calculated using the DfT guidance. In terms of VfM the methodology used the DfT guidance where a project will be poor VfM if BCR is less than 1, low VfM if BCR is between 1 and 1.5, medium VfM if BCR is between 1.5 and 2, and high VfM if BCR is over 2. It was assumed that on the grounds of VfM, no project should be funded with poor VfM, very few projects with low VfM should be funded, some but not all projects with medium VfM should be funded and most if not all projects with high VfM should be funded.

The deliverability criterion of the method was based on affordability and readiness, and was used to inform the phasing and timing of delivery. It included the risk elements of a scheme, such as the risk to the programme, risk of increased costs and risks associated with contentious schemes. This information was provided as a narrative. One of the problems with the deliverability criteria was that this information was continuously changing leading to information quickly going out of date.

The advantages of this methodology are that it is clearly linked to delivering the wider outcomes of the specific region, it informs decisions and decision makers, and it is relatively simple and evidence based.

3.3 Local authority prioritisation methods

The small and local assessment tool being developed has its focus at the local level. Three examples of prioritisation methods that have been developed for/ by local authorities will now be described. Additional examples can be found in Atkins (2008).

3.3.1 Somerset scheme prioritisation

The method adopted for the Somerset Local Transport Plan 2006-2011 was a three stage approach to the prioritisation of the £23 million Integrated transport block allocation that they received as part of the local transport plan funding (funding for schemes that cost less than £5 million). The detailed description of this method is provided in Somerset (2007). Figure 4 summarises the three stages adopted, which will now be explained. The key aim of this approach was to show how investment in capital schemes delivered against the objectives and targets in their 2nd Local Transport Plans.

In *Stage 1* the investment priorities for the local authority were used to determine the authorities capital investment programme, which is shown in Figure 4. Six key areas were identified for investment, which were urban strategies, casualty reduction, rural passenger transport, route strategies and market towns and rural areas and maintenance.

Stage 2 involved dividing the allocated money between the five key areas of the capital investment programme (maintenance is dealt with by a separate fund). This was a two part process. Firstly, each of the areas was assessed on a scale of high (3 points), medium (2 points), low (1 point) and neutral (0 points) to how they contributed to each of the LTP2 mandatory indicators and the Somerset Strategic Partnership vision for 2025. The total score for each of the five capital investment areas was then divided by the score for the area with the lowest score to give a relative score. This score provided an assessment of the relative contribution of each of these areas to LTP2 and the local area plans.

Secondly, an assessment was made as to how each of the LTP1 indicators were currently performing (how they were delivering compared to the LTP1 indicators) using a traffic light system. Green represents 'demonstrably on track to meet target or already achieved', Amber represents 'likely to be on track to meet target or no clear evidence to make a firm judgement' and Red represents 'demonstrably not on track to meet target and not likely to be achieved.'

The score for each area awarded in the first part of stage two (how it contributes to the LTP2 objectives) is then converted into a -3 to +3 scale, using the results from the traffic light system looking at how the indicator did in LTP1. 'Green' indicators are given a positive score, red a negative score. A negative score indicates that the targets were not met in LTP1. The result of stage 2 is the

allocation between the five areas of the budget for LTP2. Based on this assessment Somerset decided to “prioritise investment towards programme areas which have under performed during LTP1”.

Stage 3 involves determining which schemes within the five areas to fund. Firstly background data is collected on each of the potential schemes. Secondly, each potential scheme is assessed against its potential impact on each of the authority’s second local transport plan indicators. The same High, Medium, Low and Neutral impacts score were used as for stage 2. The score for each scheme was then added up and compared. Thirdly, a VfM assessment was made by determining the CBR. Table 1 provides the cost bands for the schemes and the scores that are applicable to each cost band. The CBR is determined by dividing the scheme score by the estimated cost score. For example if a scheme had a potential benefit of 34 (score against the LTP2 indicators) and was estimated to cost between £50,000 and £75,000 to implement (cost band 1.5) then the would be $34/1.5 = 22.6$. Finally the CBR scores are compared against priority bands. A cost benefit ratio of less than 2 means that the scheme is not allocated to the programme, 2.0 to 3.6 means a low priority band, 3.6 to 5.6 means a medium priority band and over 5.6 means a high priority band.

Linked also to stage 3 is the requirement to collect specific data relevant to each of the schemes being considered. This includes a cost estimate, the current stage of development and the expected delivery timescale as shown in figure 4.

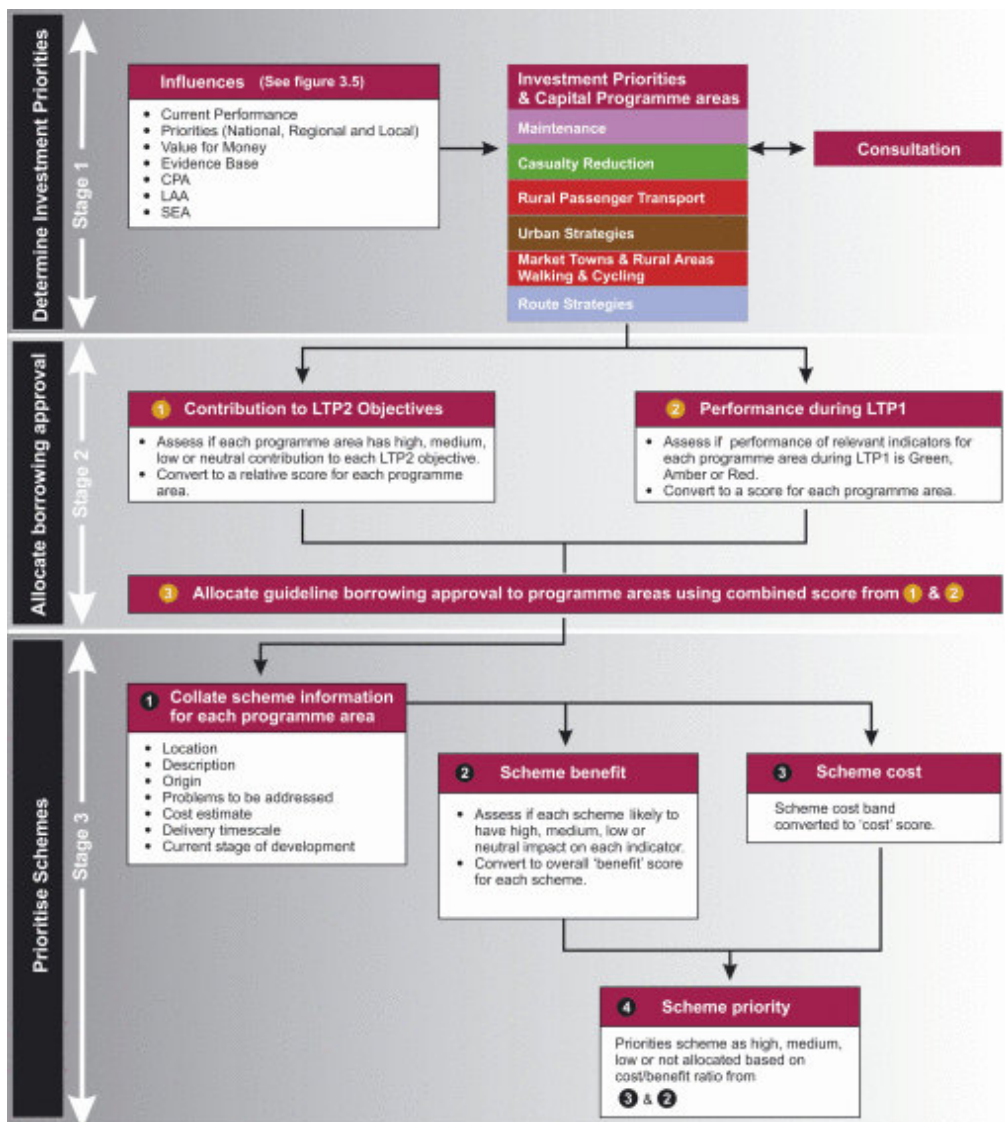


Figure 4: Overview of the funding allocation and scheme prioritisation process

Source: Somerset (2007) Local Transport Plan 2006-2011, Somerset County Council website

Table 1 Cost Bands to LTP2 Schemes

Scheme cost (£)	Score
Less than 25,000	1
25,000 to 50,000	1.25
50,000 to 75,000	1.5
75,000 to 100,000	2
100,000 to 150,000	2.5
150,000 to 200,000	3
200,000 to 300,000	3.5
300,000 to 500,000	4
500,000 to 750,000	4.5
Over 750,000	5

Source: Somerset Local Transport Plan 2006-2011

3.3.2 Kent Scheme prioritisation method

PIPKIN (Prioritising Investment Programmes the Kent Integrated Network) is the method developed by Kent for scheme prioritisation for their second local transport plan (Local Transport Plan for Kent, 2006). It was created to:

- provide a 'robust appraisal and prioritisation process' for Integrated transport schemes (i.e. schemes funded through LTP and costing less than £5 million).
- identify those schemes that make the greatest contribution toward delivering Kent's LTP policies, objectives and targets;
- provide the County Council with guidance on which schemes should be prioritised in its Integrated Transport Programme.

The assessment criteria of the method reflect Kent's transport objectives as well as national and regional priorities. The structure of the PIPKIN method is presented in figure 5. Schemes are assessed against each of the criteria in the flow diagram. The contributions of schemes are assessed as either High, Medium, low or zero for the following key criteria:

1. Scheme deliverability
2. Public acceptability
3. National/ LTP shared priority objectives (accessibility, congestion, safer roads, better air quality)
4. Regional priorities (policy compatibility)
5. Kent priorities (vision for Kent)
6. Local transport plan objectives (many)
7. Core LTP targets
8. Local LTP targets
9. Corporate targets
10. Other targets

The method used for assessing whether the scheme delivery is high, medium, or low is provided in table 2, as an example. If a scheme is assessed as being low for scheme delivery or public

acceptability then there is the option to remove it from the schemes being considered. A similar background assessment as shown in table 2 (using PIPKIN questions) for scheme delivery is completed for each of the other objectives shown in figure 5 in order to determine the high, medium, low or zero classification.

The score for each scheme is then made up of the PIPKIN scheme assessment and the PIPKIN Bonus points score. Bonus points are awarded to those schemes that either reflect specific characteristics or address specific priority issues. The PIPKIN scheme score does not include deliverability or acceptability. These two objectives are presented as a separate rating. The PIPKIN scheme score is based on the 33 PIPKIN background assessment questions (similar structure to that presented in table 2), which are divided into the shared priorities of accessibility, congestion, safer roads, air quality. These four areas are then weighted to reflect Kent’s transport priorities. In addition to this the 33 PIPKIN questions are individually weighted. The result is a score from 0 – 100 which is used to rank the schemes.

Table 2 PIPKIN scheme assessment from for deliverability

Scheme Deliverability	
<i>Please accurately assess the “deliverability” of this scheme against one of the following three statements. Please answer “yes” by inserting a “x” into the appropriate box. Your assessment will determine whether scheme deliverability is “high”, “medium” or “low”. Any “Low deliverability schemes maybe removed from the countrywide programme</i>	
	Yes
C1 – This scheme can be delivered on time, to cost and to quality. There is no significant risk that the delivery of this scheme will be compromised in terms of time, cost or quality	
C2 – There is a slight risk that one of the three risk elements (time, cost and quality) will be compromised during the deliverability of this scheme	X
C3 – There is significant risk that one or more of the three risk elements will be compromised during the delivery of this scheme. Or there is a slight risk that two or more of the risk elements will be compromised.	

Source: Adapted from PIPKIN (2008)



Figure 5 PIPKIN assessment criteria model
 Source: Local Transport Plan for Kent, 2006

3.3.3 COMPASS - Mackie et al, (1988)

COMPASS is a multi criteria analysis model which was designed to help local authorities prioritise small projects. The model replaces the cost benefit analysis with a linear evaluation procedure with user-estimated weights. These weights are not strictly dependent on market prices (or adjusted market prices) as required by the cost benefit analysis method.

Each scheme (i) is evaluated in terms of the scores (s_{ij}) it records on each dimension of impact (j), with the scores weighted (w_j) to reflect the relative importance of each impact:

$$S_i = \sum_{j=1}^{32} w_j s_{ij}$$

COMPASS identifies 32 dimensions of impacts to take into account which were based on a distillation of best practice in earlier local authority priority assessment techniques. The impacts were measured either objectively (e.g, forecast changes in accident rates) or subjectively assessed on 0-100 scales.

s_{ij} comes from a linear scaling of the measured scheme performance on impact j , but it can be made non-linear without challenging the basic evaluation model. This approach is aimed to be simple in order to make it easy to use and understood by non-specialists. There is a hierarchical evaluation system which is important in evaluating schemes which have been either assessed in detail or more generally. It also enables checking the tree to ensure that it is comprehensive and avoids redundancy or double counting. There are 32 lowest level impacts, which can be successively aggregated to either 11 or 4. Therefore very small schemes can be evaluated in terms of just four major headings of impact and the expensive schemes could have a more detailed assessment.

COMPASS ranks projects according to the ratio of their effectiveness score (S_i) to capital costs (which may be adjusted to allow for external grants received and/or maintenance cost changes).

It was noted that the derivation of the weights and being clear about the units of measurement used for assessing the impacts when assessing the weights was the hardest part of using COMPASS with local authorities.

3.3.4 MASCOT

MASCOT (Multicriteria Analysis of Scheme Options in Transport) is a computer based decision support system which uses simple multi criteria analysis principles and sensitivity testing to help in the preparation and appraisal of scheme options. This method is described in full in Bonsall et al (1993).

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.

MASCOT works through a number of stages. Firstly users are required to define each scheme and indicate its estimated costs by using three cost bands (< £500k, £500k -£1million and > £1million)⁵. The tool then provides users with a list of potential impacts depending on the estimated costs (scale) of the scheme. Users can then either remove impacts that are irrelevant or include others that are currently not included but that they think are important. The next stage is to determine the weights. Default weights are provided for each of the impacts under the "user" lists of "environmentalist", "official" and "commercial, market oriented" although users can determine their own weights. The user then scores each scheme option against each of the selected impacts by providing a "best

⁵ This tool was developed in the early 1990s.

estimate”, a “pessimistic estimate” and an “optimistic estimate” score. The program produces an aggregated weighted score for each scheme for each of the permutations of the options using the linear additive formula shown below. In this sense it is very similar to the previously described COMPASS approach. However it does include this function of different weight sets and different impact scores and in doing this promotes the functionality of sensitivity testing.

$$E_{op} = \sum_{i=1}^n W_{ip} S_{io}$$

Where

E_{op} = the effectiveness of option o judged using the weight set p

W_{ip} = the weighting given to impact i in weight set p

S_{io} = the score of option o for impact i

Bonsall et al (1993) highlight that “identifying the “best” option is not where MASCOT focus lies. Its aim is to highlight the contribution of individual impacts to each options performance in both absolute and relative terms” (p1039). In doing this 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.
- identify options that have no chance of becoming the best option in terms of performance, therefore may be excluded from further consideration.
- compare the overall effectiveness of individual options and can identify the major contributions to overall performance for each option.

3.3.5 General Guidelines

A number of publications provide more general guidelines on prioritisation methods. These include The Decision Makers Guidebook (May et al, 2005). This guidebook provides general advice on using CBA and MCA approaches to appraise projects. This document is now available online at www.konsult.leeds.ac.uk and contains a page that provides a general description of appraisal practice. This in turn refers to fuller guidance provided in the Methodological Guidebook of the PROSPECTS project (Minken et al, 2003). HM Treasury Green book (2003) is a best practice guide to carrying out appraisal for investment projects in all government departments.

Atkins (2008) has recently completed a guidance document on the prioritisation of smaller transport schemes, as discussed earlier. In this document are a set of guiding principles for developing a robust prioritisation process. The guidelines are that the process should:

- Inform decision makers’ choices not dictate them
- Be based on a technically robust and defensible process
- Involve a wide range of officers, members and stakeholders in the process
- Produce a realistic and deliverable balanced programme of schemes and interventions
- Allow sufficient time for development of the methodology (p4-1).

The key steps in developing a prioritisation process that have been identified in this report are to:

1. establish the decision context and the overall framework for the assessment

-
2. identify the schemes and interventions
 3. identify the assessment criteria and description of costs, impacts and risks (including VfM, deliverability and policy compliance)
 4. examine the results and identify priorities and non-priorities
 5. conduct a sensitivity analysis of the results to changes in scores and weights
 6. develop a program for delivery (p5-1)

While this report does not recommend a specific tool for local authorities to use in developing prioritisation methods they do provide a set of guidelines to use for completing this task.

Finally, the Improvement and Development Agency (I & DeA, 2006) provides general guidance on the priorities and the process of prioritisation within councils and provides an online prioritisation tool which ranks sets of options by getting the decision maker to compare pairs of options using criteria determined by the user.

3.4 Key findings and recommendations for the small and local scheme assessment tool

This section considered the methods used to prioritise transport schemes in the UK, at a National, Regional and Local level. There are a number of important findings that have been used to help develop the small and local scheme assessment tool. These are:

1. *The use of indicators in the assessment:* The Somerset example and PIPKIN assessment model both make use of the Local Transport Plan indicators in their assessment tool. The COMPASS method uses 32 indicators (impacts) in generating the final score, while the Yorkshire and Humberside case study scored their schemes against 15 policy criteria. MASCOT has the function of allowing the user to include user specified indicators (impacts) in the assessment.
2. *Value for Money (VfM):* A number of schemes consider VfM. At a national level parameters such as the Net Present Value (NPV) and Benefit Cost Ratio (BCR) are used to determine whether a scheme is justifiable within capital budgeting constraints. One of the problems with the VfM method used here is that it does not include the objectives that cannot be assessed in monetary terms in this assessment. This problem is resolved in the Somerset example where VfM is determined via a cost benefit ratio which is calculated by dividing the scheme score by the estimated cost score. This BCR is then compared with pre-determined thresholds that state whether a scheme is high, medium or low priority. This allows all impacts to be included. COMPASS uses a ratio of effectiveness score to capital cost to compare schemes for VfM.
3. *Impact of the scheme/ project:* A range of methods has been applied to take account of the impact of the proposed schemes against the criteria. Under the NATA case the impacts are recorded as either monetised or non monetised. Under the COMPASS methodology it is proposed that a scale of 0-100 could be used to measure impact. The Somerset example and Yorkshire and Humberside case both use a scale of -3 to +3 to signify the impact levels of the schemes, while the PIPKIN example uses a scale of high, medium, low and zero contribution.

-
4. *Use of Weights:* Weights have been applied in all the methods in one way or another. In the NATA example the decision makers weight the objectives and results that are presented in the appraisal summary table although this weighting is often not made explicit. In the Yorkshire and Humberside example a weighting system was proposed based on the categories of economic, social and environmental priorities, therefore a weight would be applied against each of the three areas. In the COMPASS example a weighting is applied to each of the individual indicators. The MASCOT example allows sensitivity to weights to be tested. The PIPKIN methodology applies a weight to both the policy areas (four shared priorities) and the indicators within these priorities that go forward to make up the final score.
 5. *Deliverability:* Both the PIPKIN methodology and the Yorkshire and Humberside methodology assess the expected deliverability of a scheme. In the NATA assessments optimism bias is used to account for the fact that costs in the areas of construction have a tendency to overrun. Sensitivity analysis is also used as a mechanism for trying to identify risks. In the STAG assessment this is covered in terms of the initial appraisal were an assessment is made considering the implementability of the scheme, which includes risks, public acceptance, feasibility etc...
 6. *Sensitivity testing:* Is a key focus in the NATA and STAG approaches. Sensitivity testing was applied in the regional assessment methods to the weighting of policy criteria, but it was found that changes in the weighting did not significantly affect the identification of priorities. It is recommended as part of the Atkins review that a sensitivity analysis is conducted on the inputs and weights.
 7. *Two stage appraisal:* The STAG approach shows that there is a place for a simpler approach before the scheme is taken through a full appraisal. This is also highlighted by the 'lighter touch' appraisal being proposed by the Department for Transport NATA review.

4 Developing a small and local scheme assessment tool

The need for the tool was described in section 2. The key uses of this tool are intended to be to aid in:

- choosing the best design for a scheme/ project
- the prioritisation of scheme (s) /project (s)
- the appraisal of scheme (s) / project (s)
- as a preliminary appraisal to using a full NATA

The key requirements for the tool were:

- a) It is appropriate for small and local scheme assessments
- b) It is an assessment of schemes against indicators
- c) It is an assessment that could be linked with and is compatible to a NATA appraisal
- d) It is a transparent and uncomplicated assessment tool
- e) It should incorporate an estimate of the cost and hence consider VfM
- f) Sensitivity Testing could be applied
- g) Output from the tool is seen to be logical.

4.1 A tool appropriate for small scheme assessment

The current approach used in England to prioritise projects (NATA, described in section 3) is a requirement for projects that cost >£5million. It was originally designed with the appraisal of large road schemes as the focus and as a result is less suited to prioritising projects on a smaller scale and schemes that have a very 'local environment' focus. It is also very time consuming to prepare due to the nature of the projects that it was designed to appraise. Therefore there is a need for a tool to pick up those projects/ schemes that do not fit into the category of >£5 million, but still need to be prioritised.

4.2 An assessment of schemes against key indicators

The interviews identified that the local authorities needed an assessment tool that allowed them to assess their proposed schemes against the indicators that they were required to propose and monitor as part of the Local Transport Plan process. The Somerset tool described in section 3 developed a system whereby each potential scheme was assessed against its impact on each of the LTP2 indicators on a scale of high (3 points), medium (2 points), low (1 point) and neutral (0 points). The score for each scheme was then added up. It was identified that at a local level there may be different indicators other than the LTP2 mandatory indicators used in the Somerset example that should be included in an appropriate assessment framework. For this reason the tool has been designed to include a wide range of potential indicators that could be included, which are summarised in Table 3. Guidance on selecting appropriate indicators is provided in the work described in Marsden et al, 2005.

One key advantage to this approach is that authorities can see how their proposed scheme(s) fared against different sets of indicators and hence judge the funding bodies to whom it would be most appropriate to apply. Information on appropriate funding sources can be found from a parallel DISTILLATE activity focusing on funding from the DISTILLATE website

Table 3 Indicators included in the tool

Indicator	Source
Mandatory LTP2 indicators	DfT (2004) www.dft.gov.uk
Local Indicators used in past APRs	DfT (2005) http://www.dft.gov.uk/pgr/statistics/datatablespublications/ltp/monitoringindicatorsinlocalt5172
Local Area Agreements	Examples of indicators used in the second round for sustainable communities http://www.sustainable-development.gov.uk/advice/local/documents/laa-sustainable-community-outcomes.pdf#top
Comprehensive Performance assessment (CPA)	http://www.audit-commission.gov.uk/cpa/stcc/downloads/CPA2007GuidetoServiceAss.pdf
NATA	www.webtag.org.uk
Local Quality of Life Indicators	Audit Commission (2005) Local quality of life indicators - supporting local communities to become sustainable http://www.audit-commission.gov.uk
Local Performance Indicators	http://www.local-pi-library.gov.uk/index.html
Sustainable development indicators	DEFRA(2006) http://www.sustainable-development.gov.uk/progress/indicators/documents/sdiyp2006_a6.pdf
Best Value Performance Indicators (BVPI)	www.BVPI.gov.uk
Sustainability Appraisal of Regional Strategies	www.communities.gov.uk
Locally Specific Indicators	To be added by authority
National Indicators for Local Authorities and Local Authority Partnerships (198)	http://www.communities.gov.uk/localgovernment/performanceframeworkpartnerships/nationalindicators/

4.3 An assessment that could be compatible to a NATA appraisal

It was highlighted by the interviews and discussion with local authorities that a simplified local assessment tool that could be a preliminary assessment before a potential full NATA appraisal

would be useful. For this reason the NATA objectives have been included in the potential list of indicators that could be selected (see Table 3). This means that the projects/ schemes can be assessed against a simplified NATA style assessment. This has the benefit of providing an estimate of how the project would fare against the NATA objectives if the scheme were put forward for the full appraisal. Similarly if there are other forms of funding available it would be possible to use the objectives/ indicators of the decision makers for that funding to assess whether it would be suitable to put forward the scheme for that form of funding. Or the methodology could be used to assess how changes could be made to the design so that it would become more applicable to the requirements of a given funding opportunity.

4.4 A transparent and uncomplicated approach

The interviews highlighted that the authorities did not want a 'black box' approach to the assessment. To solve this problem a simple excel spreadsheet approach with four stages has been developed. The four stages are:

1. Select the Indicators to be used in the assessment
2. Weight the indicators in terms of the priority to the authority
3. Assess the impact of the proposed project against the indicators
4. Aggregate score and value for money (cost estimate).

This approach has sought to combine the benefits of a number of the schemes described in section 3, but also has a number of key differences. Like a number of the methods (e.g. NATA, Somerset) one of the key stages is to assess the impact of the project(s)/ scheme(s) against the indicators/ objectives. The first key difference used in this method is that in the initial stage the authority has the scope to select the indicators that they are choosing to include (these could be the NATA indicators or they could be a combination of indicator sets). The second key difference is that they then have to make explicit the relative importance that they place on each of the indicators at an authority level by using a weight. This is different from the NATA approach whereby only the impact of the project is made public, while the decision maker's weighting of impacts is not. In order to both assess the impact of the project and apply an importance weighting, Likert scales have been used. A review of the use of Likert scales is provided in annex 1.

4.5 Cost of the scheme

One of the critical elements of any assessment is the comparison between the expected benefits and the expected costs of the scheme. This assessment requires decision makers to estimate the cost of the proposed scheme so that projects can be compared based both on the score that they achieve in the tool and on how much they will cost to implement. No attempt has been made to combine the indicators of score and cost into one indicator in order to keep the results as transparent as possible.

4.6 Full Approach

The full approach will now be described.

Stage 1

Firstly the indicators (or objectives) that are going to be used in the assessment are selected. These indicators should remain the same for all projects being compared. Under the NATA approach these would be the NATA objectives/ indicators (see table 3 for more examples).

Stage 2

Stage 2 is an assessment of the relative importance that an authority places on each of the indicators that have been selected. Ideally this assessment should be made independently of the person completing stage 3. The decision maker should weight each of the indicators on a scale of 1 to 5, where 5 is given to indicators that represent issues that hold the highest importance to the authority down to 1 which represents indicators that are the lowest importance to the authority. More than one indicator can be weighted 1, 2, 3, 4 or 5. If all the indicators are equally important then they should be given the same weighting.

In order to keep the process transparent it was decided not to normalise the weights. The result of this is that projects have to be compared against the same set of indicators (and importance weightings); otherwise the aggregate scores will not be compatible.

This stage is similar to the MCA approach that is used to assess the relative importance of the objectives in the AST.

Stage 3

Stage 3 is an assessment of the impact of the project against the selected indicators. Where projects are being compared the same individual(s) should conduct the assessment (given the subjective nature of the scores). The impacts should be assessed on a scale of -3 to +3, as shown below, where -3 is a highly significant negative impact (the indicator has got worse) +3 is a highly significant positive impact (improvement in the indicator).

Highly Significant Negative Impact			Neutral			Highly Significant Positive Impact
-3	-2	-1	0	1	2	3

The use of this Likert scale replaces the qualitative and quantitative assessments that would need to be completed for a full NATA approach. However, where possible, evidence (e.g. modelling, surveys, etc...) should be used to back up the impact scores used. Information on how evidence can be gathered on each of the indicators that are included can be taken from the sources in Table 3. An additional source of information on the impacts of policy instruments can be found at the KonSULT webpage⁶. Here an assessment has been made for 42 policy instruments as to the potential impact that they have (using a -5 to + 5 scale) on a set of fourteen key problems and

⁶ www.konsult.leeds.ac.uk

seven objectives. Information is also provided on the potential interaction effects of producing packages of two policy instruments.

Stage 4

Stage 4 provides the results of the tool. For each indicator the importance weight is multiplied by the assessment score and then summed across all indicators. The higher the score, the better a project should perform against the indicators selected. In addition to this final score it is important to include an estimate of how much the particular project would cost. The results can then be saved and compared with the results from other projects to assess which would be the most worthwhile. Alternatively this process can be used to see how to modify designs of schemes/projects so that they “are more effective” score better in the assessment. It is worth noting that the results from this tool are not transferable between local authorities, as they are based firstly on a judgement of how important the indicators are to the specific authority and then on the subjective judgement of the officer in terms of how the project impacts on the indicator.

4.7 Sensitivity testing

It is recommended as with other prioritisation methods that some form of sensitivity testing is conducted on the data used. One example of sensitivity testing would be to set the weightings in stage 2 equal and see what effect this has on the results. Another test would be to consider the implications on the results of reducing the potential impact of certain of the indicators. A third would be to have a second person independently assess the performance scores in Stage 3.

4.8 Output from the tool

One of the key reasons for using a prioritisation technique is that it allows the comparison of a large number of schemes. In order to do this effectively the output from the tool must be logical and allow schemes to be compared with ease. Currently the output from the tool can be presented in a number of ways. Firstly, for each scheme there is a sheet in excel for stage 4 (e.g. figure 9) which shows the estimated cost of the scheme, the scores against each of the indicators selected and the total score. This output could then be saved for each scheme and compared directly.

Secondly, an excel add on has been created which requires users to copy and paste the outputted stage 4 sheet for each scheme into a designed excel workbook. Each scheme being compared (e.g. schemes 1 to 8) has an allocated worksheet. Once all the schemes being compared are added into the workbook a number of outputs are automatically produced. These are:

- A comparison of costs and benefits (see figure 11)
- A detailed graph of how the individual indicators compared by score by scheme (see figure 12 for an example).

5 An example assessment using the tool

A local authority has to assess whether they should spend the money that they have available on one of two schemes along a specified main road. They are keen that the project selected should have the most impact on the objectives that the authority is promoting. The set of indicators that the authority has chosen to use to assess the two schemes are the indicators used for their LTP2 submission. The two local schemes are:

- a) A cycle lane along the main road into town X (1km)
- b) Two pedestrian crossings on the main road into town X

Stage 1 Select the indicators

These indicators are selected from the sets of indicators within the tool, as shown in Figure 6.

Figure 6 Stage 1 select indicators

Stage 1 - SELECT INDICATORS		
This is the start of the tool		
<i>In this section you should select which indicators you want to include in your assessment. You can select indicators from multiple lists and add in your own locally specific indicators</i>		
Step 1: Enter the scheme description, date and your initials		Order by Indicator type
Step 2: Decide which indicators to include (commonly used indicator sets are provided with the tool)		
Step 3: Use the drop down boxes to add the indicators for your assessment		Order by Category
You need to firstly select the indicator type using the drop down boxes (e.g. BVPI, local, LTP2) then you can select from the indicators that are under that category then you can input a category for the indicator (e.g. economic/ safety/ environment)		
Step 4: Once the indicators have been selected you can order the indicators either by indicator type or category		STAGE 2
Step 5: Once you are happy with the indicators selected click on stage 2		
Scheme Description		
Date		
Assessors Initials		
Indicator Type	Indicator	Category
LTP_Mandatory	% of a) households; b) households without access to a car; within 15 and 30 minutes of a GP by Public Transport	Accessibility
LTP_Mandatory	Congestion (vehicle delay).	Economic
LTP_Mandatory	Cycling Trips (Annualised index)	Accessibility
LTP_Mandatory	Bus punctuality Indicator	Accessibility
LTP_Mandatory	Total killed and seriously injured casualties	Safety
LTP_Mandatory	Child killed and seriously injured casualties	Safety
LTP_Mandatory	Principal Road Condition	Maintenance
LTP_Mandatory	Footway Condition	Maintenance
LOCAL	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)	Safety
LOCAL	Number of Home Zones	Other
LOCAL	Percentage of all households within 13 minutes walk of an hourly or better bus service	Accessibility
LOCAL	Number of days of air pollution	Environmental

Stage 2 Weight the importance of the indicators

The authority then has to assess the importance to their authority for each of the indicators, as shown in Figure 7. This weighting will stay the same for all projects being compared.

Figure 7 Stage 2 importance weighting

STAGE 2 - ADD THE IMPORTANCE WEIGHTING

This stage is an assessment of which indicators are important to your authority. The assessment should remain the same for all projects being compared.

In this section you need to weight the importance of each of the selected indicators. Each Indicator should be weighted individually using a scale of 1 to 5, 1 being the least important and 5 the most important

Least Important

1 2 3 4 5

Most Important

STAGE 3

Potential strategies for determining weights include:

e.g. One of the council's top priorities is to reduce child fatalities therefore it should have a weighting of 5

e.g All the LTP2 mandatory indicators have equal importance so are being given an equal weighting

Step 1: You can assign weights using the importance weighting drop down box

Step 2: When you are happy with the weights click on the stage 3 button

Indicator Type	Indicator	Category	Importance Weighting
LTP_Mandatory	% of a) households; b) households without access to a car; within 15 and 30 minutes of a GP by Public Transport	Accessibility	3
LTP_Mandatory	Congestion (vehicle delay).	Economic	2
LTP_Mandatory	Cycling Trips (Annualised index)	Accessibility	2
LTP_Mandatory	Bus punctuality Indicator	Accessibility	4
LTP_Mandatory	Total killed and seriously injured casualties	Safety	5
LTP_Mandatory	Child killed and seriously injured casualties	Safety	5
LTP_Mandatory	Principal Road Condition	Maintenance	2
LTP_Mandatory	Footway Condition	Maintenance	3
LOCAL	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)	Safety	3
LOCAL	Number of Home Zones	Other	4
LOCAL	Percentage of all households within 13 minutes walk of an hourly or better bus service	Accessibility	2
LOCAL	Number of days of air pollution	Environmental	3

Stage 3 Assessing the impact of each scheme

In this section the authorities have to assess the relative impact of each of the proposed schemes against the selected indicators on the scale of -3 to +3, where 0 is no impact. There is an evidence column where the authorities can note down the reasons why they have selected the weighting that

they have and provide any quantitative or qualitative evidence for this. The results are shown in Figure 8.

Figure 8 Impact scores for the two schemes

Stage 3: ADD THE IMPACT SCORE
In this stage you will need to estimate the potential impact of the project that you are assessing on the indicators that have been selected.
 In this section you will need to make an assessment of how you think the project will impact against each selected indicator. Each indicator should be given an impact score of between -3 and +3. A negative score means that the indicator has got worse

Examples:
 e.g. the project will reduce the number of cyclists killed by 50 so it is a highly significant +ve impact and a score of 3
 e.g. the project will increase local pollution by 20% so will be given a score of -3

Step 1: You can assign an impact score using the impact score drop down box
 Step 2: When you are happy with the weights click on the stage 4 button
 Step 3: the notes/ evidence section has been added to back up impact scores given

Indicator Type	Indicator	Category	Impact Score
	% of a) households; b) households without access to a car;		
LTP_Mandatory	within 15 and 30 minutes of a GP by Public Transport	Accessibility	1
LTP_Mandatory	Congestion (vehicle delay).	Economic	0
LTP_Mandatory	Cycling Trips (Annualised index)	Accessibility	0
LTP_Mandatory	Bus punctuality Indicator	Accessibility	0
LTP_Mandatory	Total killed and seriously injured casualties	Safety	2
LTP_Mandatory	Child killed and seriously injured casualties	Safety	1
LTP_Mandatory	Principal Road Condition	Maintenance	1
LTP_Mandatory	Footway Condition	Maintenance	0
LOCAL	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)	Safety	2

Stage 3: ADD THE IMPACT SCORE
In this stage you will need to estimate the potential impact of the project that you are assessing on the indicators that have been selected.
 In this section you will need to make an assessment of how you think the project will impact against each selected indicator. Each indicator should be given an impact score of between -3 and +3. A negative score means that the indicator has got worse

Examples:
 e.g. the project will reduce the number of cyclists killed by 50 so it is a highly significant +ve impact and a score of 3
 e.g. the project will increase local pollution by 20% so will be given a score of -3

Step 1: You can assign an impact score using the impact score drop down box
 Step 2: When you are happy with the weights click on the stage 4 button
 Step 3: the notes/ evidence section has been added to back up impact scores given

Indicator Type	Indicator	Category	Impact Score
	% of a) households; b) households without access to a car;		
LTP_Mandatory	within 15 and 30 minutes of a GP by Public Transport	Accessibility	0
LTP_Mandatory	Congestion (vehicle delay).	Economic	1
LTP_Mandatory	Cycling Trips (Annualised index)	Accessibility	2
LTP_Mandatory	Bus punctuality Indicator	Accessibility	0
LTP_Mandatory	Total killed and seriously injured casualties	Safety	1
LTP_Mandatory	Child killed and seriously injured casualties	Safety	1
LTP_Mandatory	Principal Road Condition	Maintenance	0
LTP_Mandatory	Footway Condition	Maintenance	0
LOCAL	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)	Safety	-1

Stage 4 Results and costs

This section presents the scores achieved and the estimate of the costs. Under this assessment dependent on the relative costs of the schemes the pedestrian crossing scheme has performed better against the selected indicators, while the cycling scheme has a lower score against the indicators. The results are shown in Figures 9 and 10.

Figure 9 Results outputted for example scheme 1

STAGE 4: RESULTS						
Scheme Description	Pedestrian Crossing	Assessors Initials	ck			
DATE OF ASSESSMENT	12/11/2007	Expected cost of scheme	£20,000			
Number of Indicators included	12					
SCORE	31					You need to add in your estimate of the cost
Type	Indicator	Category	Combined score (impact x importance)	Importance Score	Impact Score	Notes
LTP_Mandatory	% of a) households; b) households without access to a car; within 15 and 30 minutes of a GP by Public Transport	Accessibility	3	3	1	
LTP_Mandatory	Congestion (vehicle delay).	Economic	0	2	0	
LTP_Mandatory	Cycling Trips (Annualised index)	Accessibility	0	2	0	
LTP_Mandatory	Bus punctuality Indicator	Accessibility	0	4	0	
LTP_Mandatory	Total killed and seriously injured casualties	Safety	10	5	2	
LTP_Mandatory	Child killed and seriously injured casualties	Safety	5	5	1	
LTP_Mandatory	Principal Road Condition	Maintenance	2	2	1	
LTP_Mandatory	Footway Condition	Maintenance	0	3	0	
Local	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)	Safety	6	3	2	
Local	Number of Home Zones	Other	0	4	0	
Local	Percentage of all households within 13 minutes walk of an hourly or better bus service	Accessibility	2	2	1	
Local	Number of days of air pollution	Environmental	3	3	1	

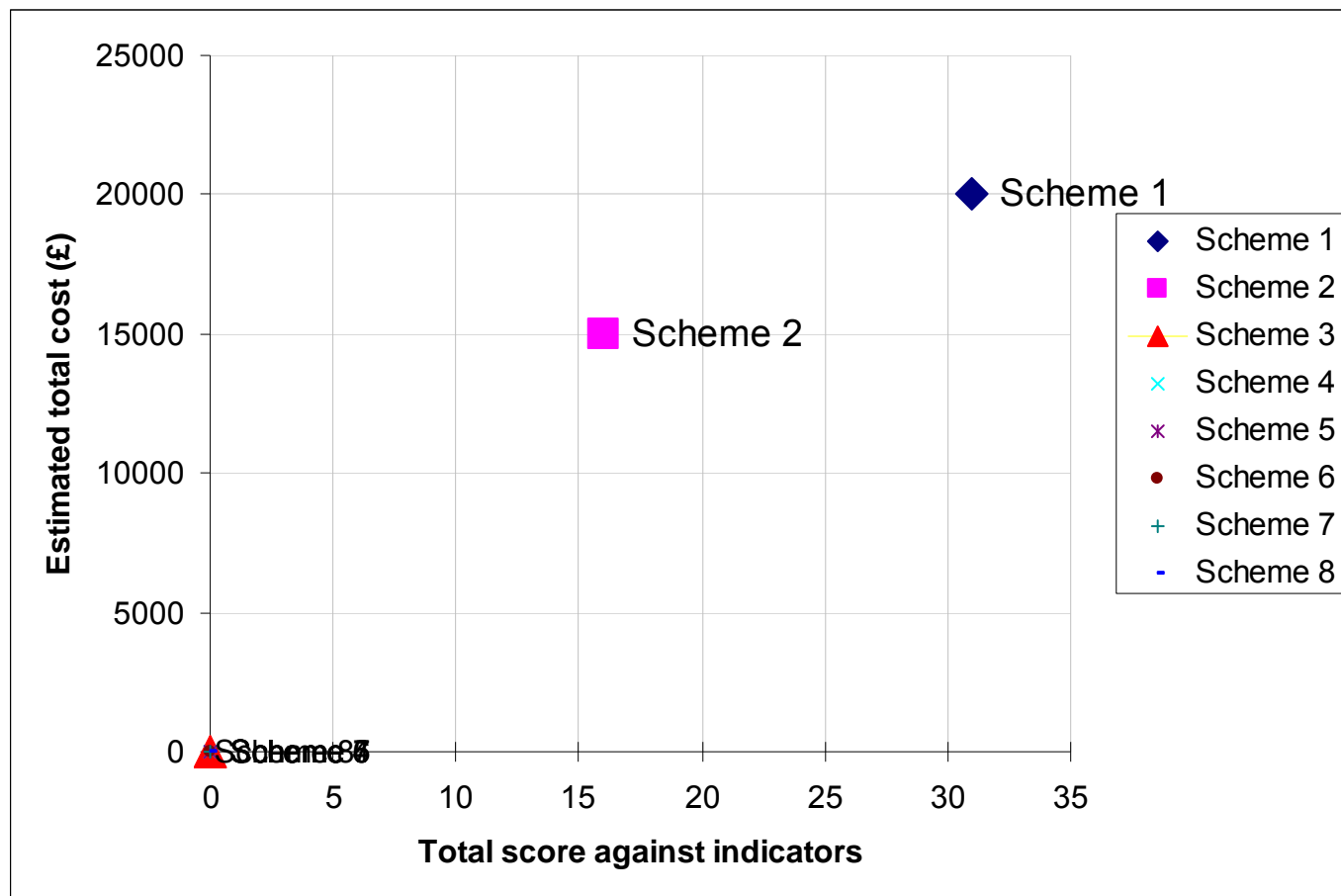
Figure 10 Results outputted for example scheme 2

STAGE 4: RESULTS						
Scheme Description	Cycle Lane	Assessors Initials	ck			
DATE OF ASSESSMENT	12/11/2007	Expected cost of scheme	£15,000			
Number of Indicators included	12					
SCORE	16	You need to add in your estimate of the cost				
Type	Indicator	Category	Combined score (impact x importance)	Importance Score	Impact Score	Notes
LTP_Mandatory	% of a) households; b) households without access to a car; within 15 and 30 minutes of a GP by Public Transport	Accessibility	0	3	0	
LTP_Mandatory	Congestion (vehicle delay).	Economic	2	2	1	
LTP_Mandatory	Cycling Trips (Annualised index)	Accessibility	4	2	2	
LTP_Mandatory	Bus punctuality Indicator	Accessibility	0	4	0	
LTP_Mandatory	Total killed and seriously injured casualties	Safety	5	5	1	
LTP_Mandatory	Child killed and seriously injured casualties	Safety	5	5	1	
LTP_Mandatory	Principal Road Condition	Maintenance	0	2	0	
LTP_Mandatory	Footway Condition	Maintenance	0	3	0	
Local	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)	Safety	-3	3	-1	
Local	Number of Home Zones	Other	0	4	0	
Local	Percentage of all households within 13 minutes walk of an hourly or better bus service	Accessibility	0	2	0	
Local	Number of days of air pollution	Environmental	3	3	1	

Stage 5 Additional outputs

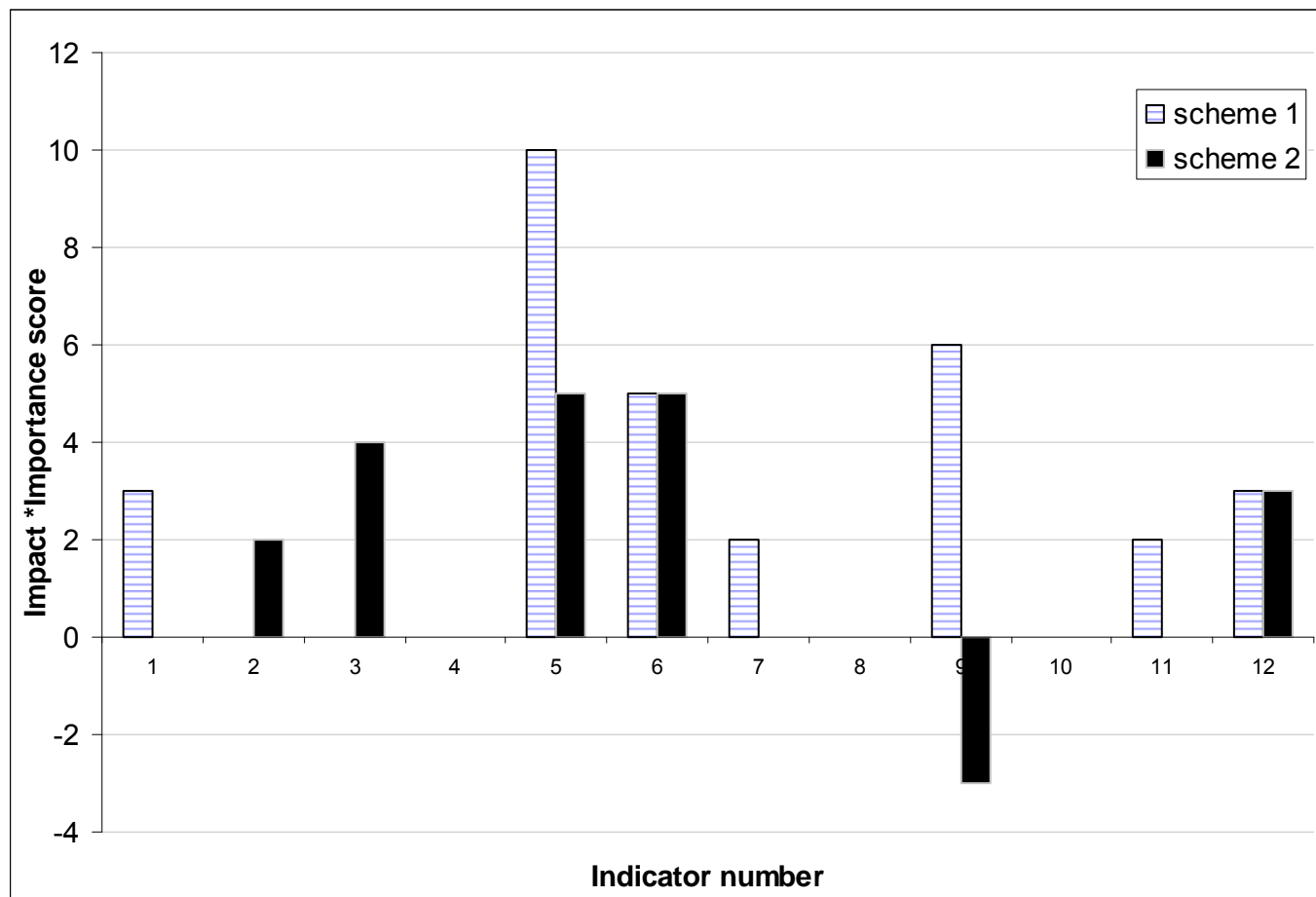
The additional outputs are achieved by pasting the results for each scheme into the file *scheme comparisons.xls*. This file will then automatically output figures 11 and 12 shown below.

Figure 11 Total score against estimated cost



	Total Score	Estimated Total Cost (£)
Scheme 1	31	20,000
Scheme 2	16	15,000
Scheme 3	0	0

Figure 12 Score against each indicator by scheme



Number	Indicator Name
1	% of a) households; b) households without access to a car; within 15 and 30 minutes of a GP by Public Transport
2	Congestion (vehicle delay).
3	Cycling Trips (Annualised index)
4	Bus punctuality Indicator
5	Total killed and seriously injured casualties
6	Child killed and seriously injured casualties
7	Principal Road Condition
8	Footway Condition
9	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)
10	Number of Home Zones
11	Percentage of all households within 13 minutes walk of an hourly or better bus service
12	Number of days of air pollution

6 Testing with local authorities and future work

This assessment methodology has been tested by one of the partner authorities and at the DISTILLATE workshops.

6.1 DISTILLATE Workshops

The preliminary tool was presented at the DISTILLATE appraisal workshop in May 2007. The authorities at this workshop were presented with a description of the tool and asked specifically about whether they thought the scales being proposed both in terms of impact and importance would be transparent to use and give enough information. It was felt that an impact scale of -3 to + 3 was understandable and would give the authorities enough scope to provide differences in the projects that they could compare.

At the DISTILLATE workshop at the end of December 2007 it was noted by one local authority officer that one feature that was missing from the tool was the feasibility of the project/scheme or 'buildability'. This would represent the problem that a project might score very well in terms of the aggregate score, but have no real chance of being implemented in reality. This functionality is not in the current tool due to the brief of producing a transparent and quick to use tool. Adding in this functionality would require further work. One possibility would be that as well as including the estimated cost of the scheme in the tool a scheme/ project "feasibility" column could be added where officers are required to state whether:

- They have stakeholder acceptance
- There are any major planning problems associated with the project/ scheme
- There are any perceived engineering problems.
- It is expected that costs could increase

The results of this could then be compared with the aggregate score and cost estimates to assess whether it would be worthwhile to proceed with a more detailed appraisal. Or alternatively, which project/ scheme should proceed.

6.2 Case Study

One of the unitary partner authorities in DISTILLATE agreed to test the tool. The tool was presented to a team at the Council on the 14th of November 2007. Comments received during this meeting included that:

- it "looked a useful tool"
- It looked a transparent process – compared to their current approach
- It was a good idea to present the cost of the scheme simply
- The range of -3 to + 3 seemed about the right level of detail for the impact score
- This would be a good tool to allow the comparison and presentation of a range of "types" of projects
- What would be the output from the tool?

As a result of these initial comments the comparison analysis add on was included (see section 4.7). This allowed projects to be compared directly in terms of VfM or in this case the aggregate score against estimated cost. The second output graph allows authorities to see which indicators the schemes/ projects are scoring well/ badly against. This could be used as a guide to how to improve the design of the scheme /project so that it achieves a better score.

The methodology was trialled by the authority in December 2007/ Jan 2008. They trialled the tool using small and local schemes, specifically a bus priority hot spot, improving pedestrian access at a roundabout and the upgrade of pedestrian facilities on a specific road. These were trialled using firstly the NATA indicators and then the LTP2 indicators.

The key findings from this trial were:

- The indicators were easy to include in stage 1 (e.g. see figure 6). It was potentially easier to copy and paste from the indicator lists included than select each row in turn and go through the drop down menu route.
- The importance weighting was straightforward. (The same person completed the importance weighting as the impact weighting in this case).
- The impact score was straightforward. However the key finding was that the more 'small' and 'local' schemes scored less well against the LTP and NATA indicators (very often a score of 0 or 1). This highlights the importance of considering the other more locally specific indicators that are included in some of the other indicator sets when considering a choice between locally specific projects. It was proposed to test the schemes again with different sets of indicators. Obviously this would require guidance on achieving a balanced set of indicators if a mixture of sets were used.
- The aggregate score was straightforward. The three projects that were tested achieved a range of scores, showing that some differentiation was able to be made.
- It was possible to show that, while the ranking of the projects under the different indicator sets (NATA and LTP) did not change, the relative scores did.
- It was possible to complete this assessment quickly – however more time would be needed to generate the evidence for the impact scores. Previously the transport officer had no paper work to back up the considerations that were being made and this method would allow them to show how they had made the decisions and present the results accordingly.
- The key problems arose when needing to paste the results from this tool into another spreadsheet a) to save the results and b) to use the comparison outputs. It was felt that this process would be better automated rather than having to copy and paste, which took time and required that the officer paste in the correct position for the output calculations to work. This is something that would require further work and computer programming.
- It was felt that the two output comparison graphs were useful. An additional sheet would be useful to just simply compare the results of the aggregate score and estimated costs.
- It was felt that this was a useful tool and would be used in a prioritisation exercise that was being required in the coming months.

6.3 Further potential developments

From the testing and the workshop discussions the three key features of the tool that would require further time/ development were:

- Automating the saving functionality and creating the outputs. This would require some computer programming work.
- Adding in a more sophisticated functionality of feasibility (discussed above)
- Testing in other scenarios.

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Annex 1 The use of Likert Scales in the assessment process

The tool described in this document utilises the functionality of likert scales to provide the weighting for importance and impact. This annex describes this method of weighting and provides some examples from the literature of where it has been used.

Likert scales and weighting procedures

Likert scales are psychometric response scales that are used widely in surveys, and are the most popular scaling procedure in use. They were developed in the 1930s by Rensis Likert to provide an ordinal-level measure of a person's attitude. Likert scaling is a bipolar scaling method, measuring either positive or negative responses to a statement. They show the level of agreement to statements.

Likert scales need a minimum of two categories such as agree or disagree, but using only two categories is seen to be too crude and forces distinctions into only two extremes. Therefore it is usually better to use four to eight categories. The categories could be combined or collapsed after data collection with such categories; however the data collected with crude categories cannot be made more precise later. However too categories may not be meaningful and people may become confused. Nunnally, J.C (1978) states that "As the number of scale steps is increased from 2 up through 20, the increase in reliability is very rapid at first. It tends to level off at about 7, and after about 11 steps, there is little gain in reliability from increasing the number of steps."

Usually, a 1 to 5 rating scale is used, for example:

- 1 = strongly unfavourable to the concept
- 2 = somewhat unfavourable to the concept
- 3 = undecided
- 4 = somewhat favourable to the concept
- 5 = strongly favourable to the concept.

It has been debated whether or not to offer a neutral category (e.g, don't know, undecided, no opinion) such as 3. A neutral category implies an odd number of categories. In some cases, Likert scales can be used in a forced choice method where the 'undecided' option 3 is not available.

The above Likert items could be scored using positive number weights (1, 2, 3, 4, 5) giving possible maximum and minimum scores, where a small number implies unfavourability and a high number implies favourability to the concept. It could also be scored in terms of positive and negative number weights (-2, -1, 0, +1, +2). Zero implies neutrality, whereas a high negative number opposes the concept represented by a high positive number. However it must be noted that the numbers assigned to the response categories are arbitrary. Likert scale measures are at an ordinal level of measurement because the responses indicate a ranking only.

There are issues that various types of bias may arise when using Likert scales, such as: the respondents may avoid using extreme response categories (central tendency bias), the respondents may agree with statements as presented (acquiescence bias) and the respondents may try to portray themselves or their organisation in a more favourable light (social desirability bias).

Oppenheim (2005) points out some criticisms and advantages of Likert scales:

Criticisms

- Lack of reproducibility: the same score can be obtained in lots of different ways. It has been argued that such a score has little meaning or that two or more identical scores may have totally different meanings. Therefore for such reasons, often the pattern of responses may be more interesting than the total score.
- Do not know where the scores in the middle change from mildly positive to mildly negative, since the scale offers no metric or interval measures and lacks a neutral point. However percentile or standard deviation norms can be calculated with a sufficient sample size and Likert scales can separate people within the same group.

Advantages

- Relative ease of construction
- Provides more precise information about the respondent's degree of agreement or disagreement, and usually more preferred than a simple agree/disagree response.
- Makes it possible to include items that are not obviously related to the attitude in question, allowing exploration of subtler and deeper effects.

The next section describes and/or gives examples of research in other disciplines (such as building, environment, management etc) where Likert scales and weighting procedures have been used.

Case studies

Sulser et al (2001)

Sulser et al (2001) used Likert scales as part of their field practical approach for assessing biophysical sustainability of alternative agricultural systems. The Likert rating survey in this study had two outputs: a summary measure based on weighted average ratings giving indications, and frequency distribution matrices for more detailed analyses of the data.

A survey was conducted consisting of 15 questions addressing indicators. A simple weighting criteria was used with factors 0.4, 0.6, 0.8 and 1.0 assigned to each indicator to be used in the summary measure.

The responses to the indicators were given on a 5-point Likert rating scale. The scale was compiled for each indicator to give consistent ratings across all criteria. Answers were adjusted to a scale from -2 to +2 with the sign referring to logically negative and positive rating for each indicator.

The data from the interviews were used in two ways:

- used as numerical ordinal responses which were averaged for each indicator and then averaged across indicators according to their assigned weights to give a summary measure of the project
- Frequency Distribution Matrices were constructed to investigate more detailed differences in participant responses. They were constructed for each indicator under each project on the 5-point Likert integer scale.

The summary measure is for assessment between projects across all criteria while the Frequency Distribution Matrices compares between each project on each indicator.

The summary measure gives the weighted averages of participant responses as well as an average project score which is made up of an average of the indicator scores. They are adjusted to a -2 to +2 scale for potential uniform comparison with other projects. When making interpretations, Sulser et al states that the exact values attained should not be used to arrive at specific conclusions on how a project contributes to each indicator, but should rather be used to make general statements for comparing projects. Low and negative scores need a more critical evaluation of the project for those indicators. Indicators that have scores close to zero can be interpreted as: a neutral score or that there is disagreement to the project's effects, or alternatively, the indicator was not necessarily appropriate for the project.

The Frequency Distribution Matrices give an indication of the unweighted division of ratings. The matrices aim to allow a critical evaluation and comparison with projects.

The Sulser et al study shows that Likert scale surveys have been useful in this study and have worked well for comparing projects and being part of a weighting procedure.

Chau et al (2003)

The study by Chau et al (2003) looks at how different managers actually choose maintenance contractors. Two methods are used to collect to find out whether there are disparities between the relative perceived importance and the relative weights in actual selection in the contractor's selection attributes.

Firstly, conjoint analysis is used to determine the actual contractor selection process. This is seen as an effective method in analysing choices in complex decision-making as it forces respondents to trade-off between products, therefore mimicking actual consumer behaviour when purchasing products. The aim is to determine the attribute combination leading to the highest client utility and to determine the relative importance of attributes in terms of their contribution to total utility.

Secondly and more relevant to our needs, Likert scale type questions are used to find out the relative perceived importance and the level of satisfaction of the existing maintenance contractors in the industry with regards to the contractor selection attributes. A Likert scale of 1 (least important) to 5 (most important) is used to find out the perceived importance, a scale of 1 (poor) to 5 (excellent) is used to find out the level of satisfaction. The data obtained was plotted using quadrant analysis (simple graphical technique mapping consumer perceptions of each attribute on a two-axis grid to guide policy based marketing strategies). The graph of the rating points was divided into four quadrants:

- capitalise (high importance/high satisfaction),
- maintain (low importance/high satisfaction)
- improve (high importance/low satisfaction)
- monitor (low importance/low satisfaction).

The study found out that the Likert scale ratings produced similar results to that of actual choice in contractor selection. But it does not mean that Likert scale ratings can directly substitute conjoint

analysis, as conjoint analysis can provide more information on the selection process and helps to estimate part-worth utility and trade-off weightings between different attributes. Simple Likert scales are adequate if needed only for a ranking process. Chau et al (2003) stated that the two methods used simultaneously were most effective in this study to find out if the perceived importance agreed with the revealed actual importance.

Albadvi et al (2007)

This paper addresses the point that the most important issue for decision making in stock trading is the selection of the right stock at the right time. The PROMETHEE (preference ranking organisation method for enrichment evaluation) is used. It is a multicriteria decision-making method and is said to be a quite simple ranking method in conception and application in comparison to other multicriteria analysis methods. It is good at problems where there are a finite number of alternatives to be ranked considering several, sometimes conflicting criteria. Information needed include the weights of the criteria considered, and the decision maker's preference function (which he/she uses when comparing the contribution of the alternatives in terms of each separate criterion).

Albadvi et al (2007) explain that the PROMETHEE method consists of the following steps:

- 1) Alternatives are compared in pairs for each criterion using an evaluation table. The preference is shown by a number in the interval $[0,1]$ where 0 represents no preference or indifference, and 1 represents strict preference. The decision maker determines the generalised criterion which is the function relating the difference in performance to preference.
- 2) A multicriteria preference index is derived for each pair of alternatives as a weighted average of the corresponding preferences computed in step 1 for each criterion. The index $\Pi(a,b)$ in the interval $[0,1]$ expresses the preference of alternative a over b considering all criteria. The decision maker chooses the weighting factors and they express the relative importance of each criterion.
- 3) Alternatives can be ranked according to:
 - The sum of indices $\Pi(a,i)$ indicating the preference of alternative a over all others.
 - The sum of indices $\Pi(i,a)$ indicating preference of all other alternatives compared to a.

Albadvi et al (2007) used a 7-point Likert scale in their questionnaire. The Cronbach test was used to check the reliability of the weights.

Araz et al (2007)

Araz et al (2007) develop an outsourcer evaluation and management system for a textile company. It was important that this system evaluates, manages and selects the suppliers as the consequences of poor decision making are severe. The paper proposes a methodology for outsourcing management utilising information obtained from outsourcing the selection process. The methodology that is proposed is based on PROMETHEE which is a multi-criteria decision aid method and using fuzzy goal programming.

A weight is assigned to each of the criteria in the rating/linear weighting models, in order to distinguish between criteria with different importance. The supplier's grades are multiplied by these

weights and a weight score (rating) is computed for each, and the supplier with the highest overall rating can then be selected.

Key Findings

The studies considered found that likert scales could be used as a proxy to measure importance levels and impact scores. For example Chau et al (2003) found that the results from using Likert scales produced similar results to actual choices made in their case study. The key advantages to applying this method to the prioritisation of transport schemes are that it allows all the indicators to be assessed on the same scale providing a quantitative response to questions that would previously have been only considered from a qualitative stand point. Likert scales are judged as being quick and easy for respondents to complete, which fits in with the transparent and simple to complete focus suggested for the G2 tool.

The literature provides some advice unto what size of scale would provide the most reliable results. Nunally (1978) identified that a 7 - 11 point Likert scale is likely to provide the most reliable results, while in practice a 5 point scale (1 to 5) is most commonly used for the scale.

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