Objectives and Problems

TAG Unit 2.2

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Department for Transport

Transport Analysis Guidance (TAG)

Contents

1 Objectives and Problems

1.1 Introduction

1.1.1 In developing a transport strategy or plan it is essential to be clear as to what the strategy or plan is designed to achieve. The answer to this question can be expressed at varying levels of generality or detail, from broad statements of vision, through strategic objectives, to more specific objectives and lists of problems to be overcome.

1.1.2 Stated objectives serve several functions. They help to identify the problems to be overcome, both now and in the future. They provide guidance on the types of solution which might be appropriate and the locations in which they are needed. They act also as constraints, in clarifying what should be avoided in pursuing any particular solution. Finally, they provide the basis for appraisal of alternative solutions, and for monitoring progress in implementation.

1.1.3 Almost inevitably, it will not be possible to satisfy all of the objectives which are identified in this way. In principle, it would be helpful, not just to have a clear understanding of the overall objectives, but also to be able to specify their relative importance, so that conflicts can be readily resolved. However, priorities between objectives are a matter for political judgement which is exercised by the decision-maker on the basis of the appraisal information against each of the objectives.

1.1.4 This TAG Unit deals with:

- the Government's objectives for transport;
- local and regional objectives;
- objectives and targets; and
- problems.

1.2 Objectives-led and Problem-orientated Approaches

1.2.1 There are, in practice, two different types of approach which can be adopted to identifying objectives and related problems. The first is the true objectives-led approach in which objectives of the kind described in Section 1.3 and 1.4 are first specified. These are then used to identify problems by assessing the extent to which current or predicted future conditions, in the absence of new policy measures, fail to meet the objectives.

1.2.2 The main drawback with this approach is that many members of the public are less familiar with the abstract concept of objectives (such as improving accessibility) than they are with concrete problems (such as the nearest medical facilities being 50 minutes away). It is to bridge this gulf that some integrated transport (or 'top-down') studies check the identified problems with the public.

1.2.3 The alternative approach is to start by defining types of problem, and to use data on current (or predicted future) conditions to identify when and where these problems occur. The objectives are implicit in the specified problems, and may never actually be stated. This approach has the merits of being easily understood. However, it is dependent on developing a full list of potential problems at the outset. If particular types of problem (like access to medical facilities) are not identified because the underlying objective (accessibility) has not been considered, the resulting strategy will be partial in its impact. It is thus important to check with the public (either directly, or through their representatives) that the full set of problems has been identified.

1.2.4 Neither of these approaches is necessarily preferable to the other. Both require checks to ensure that the problems identified are comprehensive. Once this has

been done both methods follow the approach described in *The Overall Approach* (TAG Unit 2.1). The choice between them should be determined by whether the users of the study feel more at ease with the concepts of objectives or problems. For a more detailed discussion of these approaches, see Section 2.3 of the IHT's *Guidelines on Developing Urban Transport Strategies.*

1.3 The Government's Objectives for Transport

1.3.1 The Government's objectives which underpin *A New Deal for Transport* (DETR, 1998) are:

- to promote a strong economy and increase prosperity;
- to provide better protection for the environment; and
- to develop a more inclusive society.

1.3.2 In *A New Deal for Transport*, the DfT has set out its five main criteria for transport. These may be couched in terms of objectives, as follows:

- **environmental impact** - to protect the built and natural environment;
- **safety** - to improve safety;
- **economy** - to support sustainable economic activity and get good value for money;
- **accessibility** - to improve access to facilities for those without a car and to reduce severance; and
- **integration** - to ensure that all decisions are taken in the context of the Government's integrated transport policy.

1.3.3 These objectives should be taken as a 'given' in the study areas. The intentions of these objectives are discussed below.

Environmental Impact

1.3.4 The environmental protection objective involves **reducing** the direct and indirect impacts of transport facilities and their use on the environment of both users and non-users. The environment impacts of concern include those listed in DMRB Volume 11. They include noise, atmospheric pollution of differing kinds, vibration, formal intrusion, severance, and impacts on intrinsically valuable flora and fauna, ancient monuments and historic buildings and so on. While some of these can be readily quantified, others such as severance are much more difficult to define and analyse.

1.3.5 More recently, the environmental protection objective has been defined more widely to include reduction of the impact of transport on the global environment, particularly through emission of carbon dioxide, but also by consumption of scarce and non-renewable resources.

Safety

1.3.6 The safety objective is concerned with **reducing** the loss of life, injuries and damage to property resulting from transport accidents and crime.

1.3.7 It has been common practice for some time in the UK to place money values on casualties and accidents of differing severity, and to include these within a cost/benefit analysis. These values include the direct costs of accidents, such as loss of output, hospital, police and insurance costs, and damage to property and, more controversially, an allowance for the pain, grief and suffering incurred.

However, in some cases there is concern with the direct safety performance of the system, it is therefore helpful to estimate accident numbers directly as well.

1.3.8 The safety objective is also concerned with improving the personal security of travellers and their property. The security of public transport passengers increases with the provision of surveillance, design features which reduce the opportunities for attackers to surprise travellers and facilities for making emergency calls. The security of car users increases when the instances when they are required to stop or travel very slowly are reduced, vehicles can be parked in safety and facilities for making emergency calls are increased.

Economy

1.3.9 The economy objective is concerned with improving (a) the economic efficiency of transport, and (b) the efficiency of economic activities.

1.3.10 Much economic analysis is concerned with defining 'efficient' allocations of scarce resources. Economic efficiency is achieved when it is impossible to make one person or group in society better off without making another group worse off by a larger amount. In such a situation, it is impossible to find any measures for which - if they were undertaken - the gainers would be able to compensate the losers and still be better off themselves. In other words, seeking economic efficiency means taking all measures for which the 'willingness to pay' of the beneficiaries exceeds the 'required compensation' of the losers by an acceptable margin.

1.3.11 In practice, in transport appraisal, the economy objective is usually defined more narrowly. It is often concerned primarily with maximising the net benefits, in resource terms, of the provision of transport. This is turn involves maximising the difference between the consumer surplus of travellers and the resource costs of the provision, operation and maintenance of transport facilities. Consumer surplus can be thought of as the difference between the maximum which an individual traveller is prepared to pay to travel and the actual cost of that journey. Consumer surplus is, therefore, increased when travel time, operating costs and direct payments such as fares are reduced and also when more travellers are able to travel as a result of reductions in those costs. Further information on environmental economics is available (Treasury and DfT, March 2003b).

1.3.12 Economic efficiency defined in this way is central to the principles of social cost/benefit analysis, and a higher net present value from an economic appraisal represents a more efficient outcome.

1.3.13 While some cost/benefit analyses focus on the costs and benefits for motorised travel, and treat the impacts on pedestrians and cyclists, such as pedestrian delay, as an environmental impact, it is more logical to consider economic efficiency for all travellers together, whatever their mode of travel.

1.3.14 From this, somewhat narrow, viewpoint, cost/benefit analysis excludes environmental and safety impacts, but would subsume overall accessibility effects (for the reasons given below in paragraph 1.3.18). An alternative broad view of cost/benefit analysis would include all these effects, whether or not valued in money terms, and this broad view of cost/benefit analysis would yield the overall value for money of the option being appraised. As noted in *The Overall Approach: The Steps in the Process* (TAG Unit 2.1), the Appraisal Summary Table provides the basis on which such a wider assessment of value for money will be made.

1.3.15 The second element of this objective is the efficiency of economic activities. It has often been argued that, the benefits to transport users and operators captured in a cost/benefit analysis are a satisfactory measure of the wider benefits to the economy, that is, the efficiency with which economic activities are

undertaken insofar as they are affected by transport. However, others have suggested that this fails to capture the additional benefits to economic development, particularly in areas where regeneration is a priority, of improved transport provision and transport links. SACTRA has considered this argument and its final report was published in August 1999. The Government's response to the SACTRA report on "Transport and the Economy" is available at http://www.dft.gov.uk/stellent/groups/dft_transstrat/documents/page/dft_transstrat_504948.hcsp.

Accessibility

1.3.16 In general terms, accessibility can be defined as 'ease of reaching'. The accessibility objective is concerned with **increasing** the ability with which people in different locations, and with differing availability of transport, can reach different types of facility. The term 'accessibility' has been used in the past in several different, often overlapping, ways, including the following:

- measurement of ease of access to the transport system itself in terms of, for example, the proportion of homes within x minutes of a bus stop or the proportion of buses which may be boarded by a wheel-chair user;

- measurement of ease of access to facilities, with the emphasis being on the provision of the facilities necessary to meet people's needs within certain minimum travel times, distances or costs;

- measurement of the value which people place on having an option available which they might use only under unusual circumstances (such as when the car breaks down) - 'option value' - or even the value people place on simply the existence of an alternative which they have no real intention of using - 'existence value'; and

- measurement of ease of participation in activities (for personal travel) or delivery of goods to their final destination (for goods travel), provided by the interaction of the transport system, the geographical pattern of economic activities, and the pattern of land use as a whole.

1.3.17 Planners of public transport systems often focus on the first of these, while land-use planners often concentrate on the second. It is possible to argue that the first three views of accessibility are particular views within the general framework provided by the fourth. Thus, the fourth use may be regarded as the all-embracing measure of accessibility.

1.3.18 Work by David Simmonds Consultancy, ITS Leeds University and MVA for the DfT (1998) has shown that system-wide accessibility benefits are, to a very large extent, subsumed in a **fully-specified** cost/benefit analysis - that is, a cost/benefit analysis in which all traveller responses are properly included. Thus, couched in its most general and all-embracing form, the accessibility objective would duplicate the economy objective. The accessibility objective is therefore concerned with the more specific aspects, such as access to facilities by non-car-owners and community severance.

Integration

1.3.19 The general presumption in *A New Deal for Transport* (DETR, 1998) is that integration should increase, with the aim of ensuring that all decisions are taken in the context of the Government's integrated transport policy. More specifically, this means:

- integration within and between different types of transport, so that each contributes its full potential and people can move easily between them;

- integration with the environment, so that the transport choices available support a better environment;

- integration with land-use planning, at national, regional and local level, so that transport and planning work together to support more sustainable travel choices and reduce the need for travel; and

- integration with policies for education, health and wealth creation, so that transport helps make a fairer, more inclusive society.

1.4 Local and Regional Objectives

1.4.1 The five criteria or objectives of Central Government discussed in the previous section are very broad and may not fully reflect the specific regional and sub-regional circumstances of individual studies. More specific objectives need to be set at the regional level through Regional Planning Guidance/Regional Transport Strategies as explained in *Chapter 6 of draft PPG 11* (DETR, February 1999e). Among other things, this sets priorities for transport investment across all modes, to support the objectives of the spatial strategy for the region. Outputs from the regional planning process should include integrated planning and transport proposals and objectives for both the major transport corridors and major urban areas. Studies must reflect these strategic priorities and objectives for future land uses, and show how transport options can support them. Steering Groups are also free to set out other study-specific objectives as they see fit.

1.4.2 The sources for study objectives could include:

- regional planning guidance;
- local transport plans;
- development plans;
- the plans of transport provides in the study area; and
- aspirations of local groups.

1.4.3 However, it is important that these **objectives** should be fully up to date; they must:

- all 'nest' within the Government's five main objectives, with no local or regional objectives lying outside the framework provided by the Government's objectives; and

- avoid at all costs indications of preferred solutions as these may then cause other better solutions to be overlooked in the process of establishing a strategy or plan.

1.4.4 By their nature, these objectives will be specific to each individual study; there is no requirement for them to be the same in all studies. It is therefore not practical to be prescriptive in this Guidance about the formulation of the local and regional objectives. **Some examples** of study specific objectives under each of the five Central Government objectives are as follows.

- **environmental objectives** could provide increased focus on particular aspects of the environment which were particularly vulnerable or in need of improvement; for example:

  to reduce traffic intrusion in a specified National Park or AONB or a conservation area; or

  to reduce local emissions in a specified town centre; or

to reduce traffic noise in a specified residential area, etc.

- **safety objectives** could provide increased focus on particularly vulnerable sections of the public in particular locations; for example:

  to reduce accidents to pedestrians and cyclists; or

  to reduce accidents on a specified section of road.

- **economy objectives** could provide increased focus on regeneration objectives; for example:

  to improve road access to specified areas so that redevelopment may be encouraged; or

  to provide road access to hitherto inaccessible land so that development may take place.

- **accessibility objectives** could provide increased focus on particular aspects of accessibility; for example:

  to improve access to the public transport system for the mobility impaired; or

  to ensure that all households are within a specified walking time of a public transport service; or

  to reduce waiting or interchange times for public transport users;

  to promote walking and cycling.

- **integration objectives** could provide increased focus on specific means of ensuring or improving integration; for example:

  to support specific planning policies and local land-use development proposals.

1.4.5 In some cases, objectives may not obviously be directly related to the Central Government objectives. In many cases, these will be subsidiary objectives, devised to focus on the way in which the Central Government objectives can be achieved. For example, an objective to reduce road traffic growth is likely to have been proposed to focus on ways in which Central Government's environmental objectives may be achieved. Where this kind of objective is to be employed, it is important to ensure that options which appear to perform well against them also perform well against the primary Central Government objectives. For example, an intervention which reduced road traffic growth but worsened environmental impacts would be unlikely to be satisfactory. Generally, however, this kind of objective should be avoided so as not to constrain the search for solutions unduly.

1.4.6 It may also be feasible to identify some priorities between objectives. This would be useful where options meet one objective but conflict with another; the priorities would help decide the circumstances under which particular policy instruments should be considered. Again, these priorities between objectives need not necessarily be the same for all studies.

1.5 Objectives and Targets

1.5.1 Objectives may be couched in general terms so that all they do is indicate the desired general direction of change; for example:

- to reduce the environmental nuisance caused by traffic.

1.5.2 They may also be couched in more specific terms which include the notion of a **target**; for example:

- to reduce traffic noise to below 68dB(A) in residential streets; or
- to reduce carbon monoxide levels to below 8.5 parts per million; or
- to reduce nitrogen dioxide levels to below 70 parts per billion.

There are advantages in this kind of more specific objective. It is clear when any one objective has been achieved and the degree of achievement can be measured by the extent to which conditions differ from the target.

1.5.3 However, the approach has considerable dangers. Using the example in the previous paragraph, the three objectives imply an equivalence between a noise level of 68dB(A), a carbon monoxide level of 8.5ppm, and a nitrogen dioxide level of 70ppb. A full set of detailed objectives containing targets which cover all the aspects of the five Government objectives would imply many more equivalences of this kind. In theory, this may seem a reasonable approach, but the key difficulty lies with establishing targets which imply the correct emphasis or importance of one objective in relation to another. In principle, it would be possible to derive a set of targets that people accepted as consistent through social research techniques, but the more objectives are involved the more difficult would such an exercise become.

1.5.4 In concept, of course, an objective specified in terms of a target is little different from a problem identified using a threshold. For example, an objective to reduce noise levels in residential areas to below 68 dB(A) amounts to the same as a problem identified as a noise level above 68 dB(A) in a residential area. The two concepts are sides of the same coin. Problem identification is discussed in the next section.

1.6 Problems

1.6.1 Problems may be identified in a number of ways, including:

- by **consulting** people about their perceptions of the problems, both those that they encounter when travelling and those which result from other people travelling;

- by **consulting** representatives of the regional and local authorities and the transport providers to gain an understanding of the transport and planning professional's perceptions of problems with the transport system (also see Step 4 below);

- by conducting **audits** of specific elements of the transport system in order to gain a deeper understanding of the roles performed and to analyse the extent to which the expected aims are not met; and

- by **objective analysis** of problems through analysis of outputs from the transport model in comparison with thresholds so as to enable the geographic display of the worst conditions on a consistent numerical basis across the study area.

1.6.2 The first two methods are essentially parts of the **consultation** step of the studies, see Step 4 in Figure 2.1 of *The Overall Approach: Steps in the Process* (TAG Unit 2.1). People will naturally have more reliable views about current problems than those predicted to occur at some future date. Problem identification through consultation is therefore of most use in the base or current year.

1.6.3 **Audits** can be useful ways of exploring in some depth particular aspects of the transport system. Again, however, their focus is on the current situation and past history so that trends can be identified, rather than on speculations about the future. Examples of elements of the transport system which may be suitable for detailed audits include:

- the local public transport system;
- the national rail system insofar as it affects the particular study area;
- the trunk road system; and
- the local parking system.

1.6.4 Audits should be conducted by experts in the particular aspect of the transport system being audited. As an example, the aims of an audit of the local public transport system might be:

- to describe the current services in detail in terms of routes, frequencies and fares;
- to identify the operators providing each service;
- to identify which services are run commercially and which are provided through support from the local authorities;
- to analyse the quality of the services provided in terms of type and age of vehicle;
- to assess service reliability, including factors which affect reliability, such as availability of vehicles and staff; and
- trends in factors such as vehicle-kms operated, passenger-kms carried, fares and levels of subsidy.

The general aim is to develop a detailed understanding of the services currently provided and the financial and institutional framework that applies.

1.6.5 **Objective (or systematic) analysis** of problems lies at the heart of the problem-oriented approach to transport planning. A comprehensive list of types of problem can be achieved using the framework provided by the Government's five criteria or objectives.

1.6.6 Objective analysis of problems requires the adoption of thresholds. The idea is that when a condition is measured or predicted to differ from a threshold, then a problem is said to exist. A range of thresholds can be set, so that problems may be graded by **severity**. Thus, for example, noise levels which exceed, say, 68dB(A), 72 dB(A) and 76 dB(A) would be classed as, say, 'slight', 'moderate' and 'severe' noise problems.

1.6.7 This approach is, of course, not without its difficulties. By labelling problems of different types which are of a particular severity with the same label, an equivalence is being implied between problems of that severity. Thus, for example:

- if a noise level in excess of 68 dB(A) but less 72 dB(A), say, were to be classed as a 'slight' noise problem, and

- if a carbon monoxide levels in excess of 8.5 ppm but less than 15 ppm, say, were to be classed as a 'slight' air quality problem,

then this would imply an equivalent importance of the noise range 68 to 72 dB(A) and the carbon monoxide range 8.5 to 15 ppm. The danger from such implied equivalences needs to be recognised. Evidence from consultations may be used to establish the relativities of the thresholds so that the thresholds and severity gradings reflect local opinions about problems of different kinds.

1.6.8 A further dimension to the analysis of problems is their **magnitude**. This would normally be measured based on the numbers of people affected. Problems should be classed by both severity and magnitude. A severe problem which affects no one would not be one for which a solution would be necessary. A solution to a slight problem which affected many people could, on the other hand, be much more worthwhile.

1.6.9 When thresholds are defined, they can be used, with current data, to identify the locations, times of day, and groups of traveller or resident for which problems currently occur. Given an appropriate predictive model, a similar exercise can be conducted for a future year. The model can also be used to assess whether a strategy will overcome these current or future problems, and whether it will induce new ones.

1.6.10 The strengths of the approach in which problems are identified using an objective or systematic analysis are that it enables:

- problems to be identified across the study area on a consistent basis, on a geographical background for ease of appreciation;

- problems to be identified for the future years on the same basis as the base year (and these can be validated against local people's opinions through consultation); and

- the effectiveness of the option being tested can be assessed by checking how well the problems at which the intervention was aimed would be ameliorated.

1.6.11 It is crucial to recognise that this approach may only show problems as symptoms. Some analysis of the underlying causes of the problems should always be considered. For example, it should not be assumed that a congestion problem can be solved by adding extra capacity at the location concerned. Other solutions, such as traffic reduction measures or road improvements elsewhere to take through traffic away from the problem area, may be more appropriate and may only be revealed by analysis of the causes of the problem.

1.6.12 It is attractive to think that consistency between studies could be ensured by adopting the same thresholds for the same types of problems throughout the studies. However, this is considered impractical and unnecessary - impractical because it is very unlikely that a single set of thresholds could be established to which there would be general agreement - and unnecessary because the Steering Groups and the public in the various study areas may have different ideas as to the relative importance and seriousness of different types of problem. Thus, while consistency in the way in which the information for the AST is derived is regarded as essential, locally determined problem analysis is how the local perspective can be introduced to the appraisal process.

2 Further Information

The following documents provide information that follows on directly from the key topics covered in this TAG Unit.

For information on:	**See:**	**TAG Unit number:**
Overview of the Appraisal Process	*The Overall Approach: The Steps in the Process*	AG Unit 2.1
Strategic Environmental Assessment	*Strategic Environmental Assessment for Transport Plans and Programmes*	TAG Unit 2.11
Appraising multi-modal options against government objectives	*The Environment Objective*	TAG Unit 3.3
	The Safety Objective	TAG Unit 3.4
	The Economy Objective	TAG Unit 3.5
	The Accessibility Objective	TAG Unit 3.6
	The Integration Objective	TAG Unit 3.7

3 References

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Social Exclusion Unit. *Making the Connections: Final Report on Transport and Social Exclusion*

4 Document Provenance

This Transport Analysis Guidance (TAG) Unit is based on Chapter 3 of *Guidance on the Methodology for Multi-Modal Studies Volume 1* (DETR, 2000).

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