

Developments in Transport Policy

The New Approach to the Appraisal of Road Projects in England

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1. Introduction

Since the election of the Labour Government in May 1997, UK policy on trunk roads has been developed as part of the Roads Review.¹ The publication of that Review in July 1998 (honouring an election manifesto commitment), shortly after the Government's more general Transport White Paper was published, signalled a major shift in policy on trunk roads (DETR, 1998a). As recently as 1990 the Government's trunk road programme consisted of over 500 schemes.² In contrast, the Roads Review lists a new targeted programme of improvements comprising 37 schemes that it wants to start building within the next seven years. Some 36 schemes were withdrawn from the programme (they were either cancelled or left for local authority decision), while decisions on a further 44 schemes were deferred pending further study. This policy change reflects growing environmental concerns about the impacts of roads and traffic growth. It also reflects the Government's overall transport policy, set out in the White Paper, to develop a more integrated transport system by reducing dependence on the car, promoting alternatives, and giving a higher priority to the environment (DETR, 1998b).

An important element in how decisions in the Roads Review were made was the government's new approach to the way in which road projects are appraised. This policy note explains why the Government felt it necessary to adopt a new approach, how this new approach was applied in the context of the Roads Review, and an intention to develop the new approach and apply it to other forms of transport and policy instruments in future.

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¹ In the UK a trunk road is defined as a road that is the responsibility of Central Government because it carries a high proportion of long-distance and through traffic.

² Since then about a third of these schemes have been built and a third have been dropped from the programme.

2. Background to the New Approach

In order to promote the efficient use of resources within the public sector, it is important that projects (such as road schemes), or policy proposals, which give rise to costs and benefits, are subject to economic appraisal (HM Treasury, 1997). Methods for the economic appraisal of road schemes were first developed by the Ministry of Transport in 1963, although these were not formalised until 1967 (DOE, 1973).³ Since 1973 cost-benefit analysis, in some shape or form, has been used to appraise trunk road and most local authority road schemes. The economic assessment centres upon outputs from the COBA (COst-Benefit Analysis) computer program. This estimates the benefits of a scheme, arising from savings in journey times and vehicle operating costs to road users, and from the reduction in accidents to both road and non-road users. These benefits are expressed in monetary terms and compared with the construction and maintenance costs of the scheme. An important output from COBA is the ratio of the benefits to costs (both of which are measured in terms of discounted present values) known as the Benefit Cost Ratio (BCR).

In 1977 the independent Leitch Committee, appointed by the government, criticised the partial nature of the cost-benefit analysis on which COBA was based, and proposed a broader appraisal framework (ACTRA, 1977). Two years later Leitch reported on the government's progress in developing a broader appraisal framework (SACTRA 1979). Eventually, in 1983, the Environmental Appraisal Manual was published. This was the forerunner of the methodology currently used to carry out an Environmental Impact Assessment (EIA) of a road scheme, as set out in Volume 11 of the *Design Manual for Roads and Bridges*.

The EIA identifies, describes and, where possible, quantifies the environmental impacts of a road scheme. Monetary values are not applied to quantified impacts because there is not yet, within the UK, a general consensus about the rigour and acceptability of these values. In recent years, the Department has commissioned a number of studies on environmental valuation and it intends to make further progress in this area (Tinch, 1995).

Account has also been taken of the views of the government's network of Regional Offices about the impact of the scheme on local development and regeneration. Taken together, these three elements — COBA, the EIA, and the views of the Regional Office — are the major inputs into the decision-making process about whether or not to build or improve a road, and the priority to be attached to the scheme.

Criticism has, however, continued to be levelled at that approach, in terms of the transparency of the process and the potential for bias arising from the way impacts are reported. The World Road Association has found that the correlation between road schemes that have been given a high priority, and indicators that are used to show the value of a road scheme, varies between countries (PIARC, 1998). In England a common

³ Since 1963 trunk roads in England have been the responsibility of the Ministry of Transport, Department of the Environment, Department of Transport and, since 1997, the Department of the Environment, Transport and the Regions.

criticism of past appraisal methods used for trunk road schemes has been that they focused too much attention on a selection of summary economic measures, such as the COBA benefit-cost ratio, at the expense of the more detailed reports about the impacts of the scheme on the environment and local economic development.

3. Applying the New Approach to the Roads Review

A key objective of the Roads Review was to develop a clearer and more transparent framework to appraise trunk road investment proposals (DETR, 1997). Ministers were keen to ensure that an appropriate balance was struck between the information presented about the economic and environmental impacts of trunk road schemes. The new approach to appraisal is broadly based and takes account of five criteria: environmental impact; safety; economy; accessibility; and integration (see Table 1).

An important element of the new approach has been the development of an Appraisal Summary Table (AST). This is a one-page summary of the key impacts of a trunk road scheme against the five criteria. It is based on information taken from COBA, the EIA, and the government's regional offices. The purpose of the AST is to make the appraisal process more transparent. It provides a clearer, more systematic and consistent basis on which to found decisions about which trunk road schemes should proceed, and which should take priority.

The information presented in the AST reflects the *net* effect of the trunk road scheme against each of the five criteria, compared with a scenario without the road scheme. This is done in a way that does not give prominence to any one type of effect, or to those benefits expressed in monetary terms compared with those which cannot be measured in the same way. In addition, three of the criteria were further divided into several sub-criteria, reflecting the wide variety of impacts arising from schemes. In setting out more explicitly the criteria against which decisions about whether or not to build, and the prioritisation of trunk roads, are made, the new approach closely resembles an application of multi-criteria analysis. This is an appraisal technique that takes account of those impacts that can be valued in monetary terms and those that cannot be valued in this way. In recent years several suggestions have been made about combining COBA and EIA in a multi-criteria-type framework (see: Commission of the European Communities, 1994; Cole and Holvad, 1994; Lichfield 1996; and Nardini, 1997).

In the Roads Review, the impacts of a trunk road scheme were expressed against each of the sub-criteria in the following ways:

- **qualitatively:** using words to describe the main impacts;
- **quantitatively:** using numbers to measure the scale of the impacts; and
- as a **summary assessment:** providing a single indication of the impact of the scheme using either a monetary value, a quantitative indicator, or, where these cannot be estimated, a descriptive ranking on a point scale.

Table 1
Criteria and Sub-Criteria used in the New Approach to Appraisal

<i>Criteria</i>	<i>Sub-Criteria</i>
Environmental Impact*	Noise Local Air Quality Landscape Biodiversity Heritage Water
Safety	not sub-divided
Economy	Journey Times and Vehicle Operating Costs Journey Time Reliability Scheme Costs Regeneration
Accessibility	Access to Public Transport Community Severance Pedestrians and Others
Integration	not sub-divided

* Environmental Impact also includes data on changes in CO₂ emissions.

Application of the new approach has involved the Department working closely with the government's statutory environmental advisers — the Countryside Commission, English Nature, English Heritage, and the Environment Agency — to develop quantitative indicators and descriptive rankings for the environmental sub-criteria. The descriptive rankings developed for landscape, biodiversity, and heritage have been based on the newly developed Environmental Capital technique. This attempts to summarise objectively the environmental characteristics of an area (CAG and LUC, 1997). In the Roads Review, assessments were made of the landscape, biodiversity, and heritage characteristics in areas close to a proposed trunk road scheme and, using information taken from the EIA, of the impact that the scheme would have on those characteristics.

A different approach, based on the risk of damage, was taken for the water sub-criterion. This reflects the particular impacts on the water environment from road schemes (DETR, 1998c).

The new approach to appraisal does not weight any of the various sub-criteria. That is left for decision-makers. Attempts to do this would implicitly place relative values on the various impacts, even though a consensus does not yet exist in the UK on what val-

ues to apply for environmental impacts. However, the new approach does mark a fundamental change in the way in which information about road schemes is presented to decision makers. It makes the underlying problems and consequences of each scheme more explicit. It assists the comparison and ranking of schemes, particularly where positive impacts have to be traded off against different and negative ones. It does this in a way that attempts to give all impacts equal prominence.

As part of the Roads Review, the government has made freely available the ASTs for 68 schemes that were sufficiently advanced to be candidates for the targeted programme of improvements.

The government believes the new approach is suitable for use in the future planning and development of a wide range of road investment proposals on trunk and local authority roads in England. It has therefore issued new technical guidance for consultants and project managers on how to complete an AST (DETR, 1998d).

4. Applying the New Approach to Other Modes and Policy Instruments

The government aims to make the new approach equally applicable to the appraisal of projects and policies that relate to other forms of transport (DETR, 1998b). This will facilitate the comparison of options from different modes of transport when choosing solutions for a wide range of transport problems. When a transport problem is identified, ASTs will be completed for each option, thus aiding the appraisal of different forms of transport. The AST will be expanded to include aspects that relate more directly to other modes of transport, such as security, reductions in waiting times, and better quality vehicles. In future, strategic transport planning will be an important part of the system of regional and local land use planning. In the Roads Review, the government announced a programme of studies that would examine the most severe problems on the trunk road network and recommend multi-modal solutions to those problems that would be consistent with regional land-use planning.

It is intended that the new approach to appraisal should inform all stages in the development of projects and policies for all forms of transport. It should establish a clearer and more consistent basis for providing the relevant information. The new approach will enable the relative merits of options to be exposed more clearly. For example, it will show whether smaller-scale options or traffic management can achieve some or most of the benefits of larger road schemes, or whether less intrusive schemes would achieve the objectives of a larger scheme.

In the longer term, the Department is keen to develop detailed economic and environmental appraisal methods that better facilitate the comparison of alternative forms of transport and policy instruments, when appraising solutions to identified transport problems. It also aims to make the new approach even more objective, particularly in those areas where accepted techniques for valuing impacts are not yet available.

Figure 1
Appraisal Example

72,000 vpd (27% HGV). Poor safety due to poor alignment and accesses/minor junctions on existing D2AP. Lengthy delays especially during maintenance. Community severance in Ferrybridge and Fairburn where properties affected by high noise levels & air pollution.			
A1 in this area caters mainly for long distance traffic, including many HGVs. Public transport solutions would not cater for sufficient traffic to relieve problem. On-line widening would require substantial demolition of properties.			
ENVIRONMENTAL IMPACT	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
CO ₂ tonnes added 2000 - 5000	Over 2500 properties would experience a slight increase in noise without the scheme.	No. properties experiencing (w/s): - Increase in noise 10 - Decrease in noise 680	net 670 properties win with scheme*
	NAQS NO _x objective exceeded along scheme and PM ₁₀ level increases by 2µg, but no properties close.	No. properties experiencing: - improved air quality 94 - worse air quality 0	-236 PM ₁₀ * -994 NO _x *
	No significant impact. Some areas to North of scheme designated by LAs as of Special Landscape Value.		Slight -ve
	No significant direct impact. But some habitats over 0.5km to the south of Mickfield and close to Fairburn Ings SSSI affected.		Slight -ve
	Benefits to the Old Bridge across the River Aire at Ferrybridge (a scheduled monument), balanced by impact on Ferrybridge Henge (also a scheduled monument). Mitigation for latter agreed.		Neutral
	Assuming effective mitigation, risk of damage to the water environment is likely to be negligible.		Neutral
	Accident savings cover nearly half of the costs.	Accidents Deaths Serious Slight 700 60 510 590	PVB £39m 43% of PVC
	Maintenance delay savings of £250m.	peak inter-peak 3.1 mins 1.4 mins	PVB £300m 330% of PVC
		Route stress before 142% after 33%	PVC £91m Large
	Serves West and South Yorkshire Assisted Area and Yorkshire and Humberside ERDF Objective 2 areas.	Serves regeneration area? Development depends on scheme?	Low rel to PVC Yes
	Small number of public transport journeys on route limit potential benefit.		Neutral
	Significant reduction in community severance in villages of Fairburn, Brotherton and Ferrybridge (over 680 dwellings in total)		Large +ve
	Little impact on pedestrians and others.		Neutral
	Consistent with West Yorkshire Transport Package, Leeds and Wakefield UDPs and Regional Planning Guidance.		Neutral
		PVB £337m PVC £91m NPV £245m BCR 3.7	