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*The Theory and Practice of  
Evaluation*

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**Table of Contents**

- 1 Introduction**
- 2 The Purpose, Scope, Context and Tools of Evaluation**
  - Why Evaluation?
  - Scope of Evaluation
  - The Decision-Making Context
  - Tools of Evaluation
- 3 Generic Evaluation Frameworks**
  - SEM 2000 Programme and Good Practice Evaluation Guidelines
  - MEANS Guidelines for Evaluating Socio-Economic Programmes
  - UK Green Book on Appraisal and Evaluation in Central Government
  - World Bank
- 3 Evaluation Frameworks in Transport**
  - National Frameworks of Evaluation
  - Inputs from European Research
- 4 Towards a New Harmonised Framework for Transport?**

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## **The Interdisciplinary Centre for Comparative Research in the Social Sciences**

*ICCR Working Paper 407*

June 2000

### **The Theory and Practice of Evaluation**

LIANA GIORGI & ANNURADHA TANDON

*ABSTRACT. The paper provides a systematic overview of the main issues and problems related to evaluation in general, and for transport in particular. The first section discusses definitions, the scope of evaluation, the role of the decision-making context and the tools for evaluation and how they can be classified. The second section reviews existing generic analytical frameworks for evaluation as advocated by national administrations or international organisations; the third section the state-of-the-art in this field in transport. Finally in the concluding part we reflect on the open questions that need to be addressed when developing an analytical framework for evaluation suitable for transport policy.*

## ICCR WORKING PAPER 407

### Introduction

Evaluation is not a new field: it grew in the 1950s in parallel with the implementation of large-scale programmes for urban and regional development following the end of World War II, and gradually gave rise to a new specialisation within the social sciences, namely policy and public administration specialists or policy analysts (cf. Rossi and Freeman, 1993). There is by now a wide literature on the principles of evaluation, its objectives, the methods used, the problems and barriers and its use in policy formulation and implementation (for a review of the relevant literature see OECD – Freeman, Rossi and Wright, 1980; Rossi and Freeman, 1993; Parsons, 1995; and Chelimsky and Shadish, eds., 1997). Evaluation is in several countries well ingrained in the policy decision-making process: forerunners in this connection are the U.S. and the U.K. where the General Accounting Office and the Treasury respectively produced guidelines for evaluation.

Evaluation is also not new in the transport sector. However, it is not as entrenched at the level of policy as in the fields of health, education, housing or work. There are several reasons for this. Indicative is that the term ‘policy analysis’ as a research field in its own right is indeed new in transport whereas the terms ‘planning’ and ‘assessment’ have been dominant, with infrastructure investment – and hence also project appraisals – delineating the main reference framework. This has also meant that the professional group that has emerged to provide evaluations comprises mainly economists and engineers with little input from political scientists or institutional economists who have dominated the policy evaluation field in other areas. Furthermore, even though several transport economists argue in favour of a specialised approach within economics for transport “in many respects transport economics is simply the application of microeconomic principles and methods to an economic activity consisting of the movement of freight and passengers” (Rus and Nash, 1997, p.1).

In fields like health or education, policy programmes or local projects explicitly and directly target the welfare of citizens or seek to address specific social needs – here, evaluation is called upon to assess these needs and/or the outcomes of the intervention. Transport is most often seen as a derived demand, a service not required in itself, but simply to facilitate the meeting of other human needs. Hence, it is not surprising that, in the field of transport planning, the objectives more often than not relate to economic efficiency and/or growth – in turn assumed to produce benefits for the public (in the abstract) –, and evaluation is applied for “checking plans for public expenditures” (Rus and Nash, 1997); for estimating time savings;

## **ICCR WORKING PAPER 407**

for investigating mainly at the macro-economic level the relation between infrastructure investment and urban or regional development (cf. Banister, 1995); or for assessing social and environmental impacts, albeit as externalities (cf. Hoon Oum *et al.*, 1997).

The process of European integration has however changed the evaluation landscape in transport – the Transport RTD programme under the Fourth Framework Programme provides ample evidence to this (cf. Banister, 1993; Bentzen *et al.* 1995; Giorgi and Pohoryles 1998; 1999; Ponti, 1997). The drive towards harmonisation has brought policy evaluation as distinct from project appraisal on to the agenda and has increased demands for ‘strategic assessments’ for checking the consistency of ‘policies, plans and programmes (PPP)’ or for approaching ‘the design of projects in a generic sense’ (CEC, SEA – Existing Methodology, 1994; CEC, SEA – Case Studies on SEA, 1997; ISPRA, 1997; cf. Also Banister and Lichfield, 1995).

These new demands in the field of evaluation arise by way of the debate on ‘sustainability’ both with respect to the environment and with respect to distributional considerations or accessibility. This is not surprising. These are issues that question the utilitarian principles that underlie the classical transport planning approach with its strong emphasis on economic efficiency. From the methodological viewpoint they also reveal the complexity of impact assessment where there is a multitude of types of impacts and impact groups and where cost-benefit or cost-effectiveness analyses are required.

The purpose of this working paper is to provide a systematic overview of the main issues and problems related to evaluation in general, and for transport in particular. The first section discusses definitions, the scope of evaluation, the role of the decision-making context and the tools for evaluation and how they can be classified. The second section reviews existing generic analytical frameworks for evaluation as advocated by national administrations or international organisations; the third section the state-of-the-art in this field in transport. Finally in the concluding part we reflect on the open questions that need to be addressed when developing an analytical framework for evaluation suitable for transport policy.

### **The Purpose, Scope, Context and Tools of Evaluation**

#### *Why evaluation?*

Evaluation is “a process which seeks to determine as systematically and objectively as possible the relevance, efficiency and effect of an activity in terms of

## ICCR WORKING PAPER 407

its objectives" (Rossi and Freeman, 1993, p.3). In other words it represents the assessment of the outputs, outcomes and processes of an activity (US General Accounting Office, 1991).

When tied to the original goals and objectives of public policy, evaluation represents a process of verification of the extent to which these goals were met as well as a procedure for improving the accountability of public institutions. Following from the above, it carries a normative element and has a practical orientation as it is expected to produce results that can be applied to improve policy interventions (Evaluation Manual for EC Structural Funds, 1999).

Evaluation can have one or several objectives. It can be employed for judging whether an intervention is legitimate or not; for examining whether an activity conforms to statutory and regulatory requirements, programme designs and professional standards; to provide feedback as part of a monitoring exercise; or for assessing the outcomes of a policy intervention and, in this connection, to provide information on the use and allocation of public resources or the efficiency of a programme.

### *Scope of evaluation*

No evaluation exercise can meet all of the above objectives at the same time. This is why it is useful to determine the scope of an evaluation exercise early in the evaluation process.

The scope of the evaluation is determined by the decision-making process. There are two main aspects to this: the first is the stage of the decision process at which evaluation is employed; the second is the level of analysis.

With reference to the stage of the decision process, a common reference point is that of the classical decision-making model which distinguishes between four main phases, namely the agenda-setting or problem definition stage, the policy design phase, the policy legitimation phase and the policy implementation phase. Palumbo (1987) reformulates the objectives of evaluation according to this policy cycle as follows:

- In the agenda setting / problem-definition phase, the objective of evaluation is to define the size and distribution of the problem, to forecast or determine the needs and identify the target groups or areas.
- In the policy design phase, decision analysis techniques involve the identification of alternative means of achieving programme ends with the purpose of selecting the most cost-effective alternative.

## ICCR WORKING PAPER 407

- In the policy legitimization phase, evaluation must assess the acceptance of a policy or programme by the public and stakeholders.
- Finally in the policy implementation phase, evaluation checks whether the policy is implemented properly, i.e. according to standard procedures and in line with the original objectives.

In transport evaluation literature (Leleur 1995, Turro 1999, Sugden and Williams 1978, Layard and Glaister 1996, Atkinson and Cope 1994, Pearce and Hett 1999) one refers alternatively to *ex ante evaluation* to describe evaluation that is carried out in the problem definition or policy design phases also known as appraisal; *intermediate evaluation* to describe evaluation undertaken during the implementation stage for the purpose of monitoring; and *ex post* evaluation to describe evaluation that is carried out once the implementation phase is completed and for the purpose of assessing the project or programme's impacts.

Insofar as the level of analysis is concerned, it is widespread practice to distinguish between policies, programmes and projects, where policy refers to a set of programmes or measures that have the same specific objectives, schedules and modes of management; programme, to a co-ordinated set of activities of limited scale and budget; and project, to a non-divisible action with a mode of management, a schedule and a budget that are well defined from the outset (EC Manual for Structural Funds, 1995).

Project evaluation tends to focus on the assessment of socio-economic viability of a distinct set of alternative options. The objective here is to determine the best option for achieving the programme or project alternatives or the most cost-efficient solution (Sugden and Williams, 1978; cf. also EC Manual on financial and economic analysis of development projects 1997).

Policy and programme evaluation are broader. According to Rossi and Freeman (1993) the objectives of policy and programme evaluation are primarily to provide input to decision-making by developing a rationale and justification for action. This definition restricts policy and programme evaluation to the agenda-setting phase. However this need not be the case. Pearce and Hett (1999) consider it possible to carry out a policy or programme evaluation also ex-post, for instance, however they underline that this is much more complex than at the project level.

The reasons they give are as follows:

- Projects have a well-defined project cycle which tends to be well understood. In contrast, policies are far more difficult to evaluate because their consequences are not well understood.

## ICCR WORKING PAPER 407

- Projects are small relative to the scale of the national economy, thus even when they fail they do not have major consequences for the population at large. The stakes are much higher in the case of policies, which next to having widespread impacts produce long-term effects which might be more important to assess than the direct short-term impacts.
- The quantification of impacts is likely to be more difficult for policies than for projects because of the plurality of intermediate variables which need not be specific to the policy under investigation.

On the same subject, Sansom *et al.* (1999) note the problematic nature of the timing of policy evaluation or impact assessment that derives from the mismatch between the desire for early policy evaluations of major interventions (for the purpose of guiding future interventions) and the time taken for the impacts to occur.

### *The decision-making context*

The political nature of evaluation (cf. Atkinson and Cope, 1994) is closely connected to the way it is situated in the decision-making context. This is characterised by a plurality of actors, ideas and interests. Each of the actors has their own agenda and own representation of the public interest. Reaching a decision is thus often a process of, or an attempt at, reaching consensus. Deliberation and bargaining are intrinsic parts of this process, and evaluation can become the means to exert pressure on specific interest groups. This is an aspect of evaluation that one needs to be aware of. An understanding and knowledge of the decision-making context is important in order to avoid the abuse of one as an evaluator, or of the evaluation results.

The European decision-making context is a particularly complex one. The term currently in use for describing this is multi-level governance. The goal of achieving conditions of 'fair competition' are at the core of harmonisation attempts in various policy sectors which, in turn, resulted in the emergence of supranational decision structures and in an impressive activity of the Union (previously the Community) in the regulatory field. Over 50 per cent – some argue closer to 80 per cent – of contemporary national legislation derives from the transposition of European directives and regulations entailed in the so-called *Acquis*. Several of these regulatory directives are in fact about deregulation: in transport, specifically, they are about removing barriers to market access and thus competition, and they are about liberalisation. A fair proportion deals with the establishment of 'product' standards: for instance technical standards for trucks, social standards about working conditions; as well as safety and environmental standards. In some fields,

## ICCR WORKING PAPER 407

particularly fiscal harmonisation and pricing, harmonisation has not yet been achieved but is ongoing.

Across all modes, the harmonisation of legislation is however not equivalent to implementation. Indeed the implementation deficit, the spatial distribution of which is not uniform, represents a major constraining factor when establishing the 'background' conditions for evaluation.

In the field of infrastructure planning the European Union also has a major role to play, however its influence is constrained by the principle of subsidiarity (much in the same way that at the national level it is often argued that the competency for regional infrastructures lies with regional or local authorities). Insofar as many major infrastructure projects form part of networks that are transboundary, this raises the problem of co-ordination. No adequate solution has been found to this problem. This often makes for 'bizarre' situations whereby transboundary projects are evaluated differently by different national administrations, using different traffic forecasts and different methodologies.

Multiple-level governance is also characterised by potentially a more active involvement of economic interest groups as well as of social movements, like environmental groups, workers' associations or trade-unions.

How can evaluation take into account all these factors? Probably the most honest and sensible answer is that it cannot, especially considering the structure of commissioning evaluation, i.e. through specific agencies representing specific interests or having a specific stake in the decision process. Instead, Sen (1997) argues, it might be better to accept the differences across agencies, thus also evaluation studies, and be explicit about the so-called 'areas of control' of the evaluation. This then implies that the emphasis is placed less on harmonising evaluation methods, more on using the results in a constructive way in the decision process, re-shaped as a process of deliberation among relevant actors. Far from shifting the responsibility away from the evaluator this implies being stricter on the quality standards applied to the use of evaluation methods and tools.

### *Tools of evaluation*

There are several tools that can be used for evaluation. These can be classified mainly along four dimensions:

1. The analytical framework from which they emerged and within which they mostly operate;
2. Their suitability for policy, programme or project evaluation;

## ICCR WORKING PAPER 407

3. Their suitability for different phases of policy analysis (i.e. ex-ante, monitoring or ex-post);
4. The extent they rely on statistical or mathematical methods or tools or alternatively on 'softer' methods.

Existing classifications like those proposed by government bodies tend to consider primarily the second and third dimensions above, i.e. tools are classified according to their suitability for policy, programme or project evaluation and with reference to the timing of the evaluation exercise.

We would contend that if classification schemes are to be good more than just as an inventory, they have to consider the two other dimensions mentioned above, namely the analytical framework of the method in question, and the extent of reliance on statistical or mathematical methods. We explain below why we think these two dimensions are equally if not more important for assessing the suitability and applicability of different methods to different problems encountered.

*Clarifying assumptions and not just objectives.* The analytical framework or metalevel of evaluation is not one which is today often dealt with explicitly. Either it is taken for granted that for instance cost-benefit analysis is rooted in welfare economics, or this is assumed not to be important either for the demand or the supply side of evaluation. This we think is the root of many flawed or unnecessary evaluations at either the project or programme level.

Parsons (2000) distinguishes between eight analytical frameworks for evaluation: neo-classical economics, experimentalism, managerialism, public choice, pragmatism, interpretivism, evaluation through the price system and critical realism. The first point to be made about these frameworks is that they apply equally to policy analysis or analysis for policy as they do to evaluation. The second important point is that they each entail different assumptions about epistemology and methodology; the complexity of problems; institutional settings or more generally the decision context, and, last but not least, welfare.

For example, mainstream approaches to evaluation like neo-classical economics or public choice are concerned with the systematic compilation and analysis of 'scientific' types of knowledge – they insist on the importance of causal relationships that can be objectively verified and are keen on quantification or on tools that allow for quantification; in other words they are positivistic and rely on instrumental rationality. Non-mainstream approaches like interpretivism or critical realism operate instead within a post-positivist framework, are more keen on recovering interactions and interrelations and less insisting on quantification, or the use of statistical methods or mathematical models.

## ICCR WORKING PAPER 407

With regard to the perception of complexity, analytical frameworks differ regarding their degree of suitability for dealing with complex problems, or what Parsons (2000) following Ritter and Weber (1973), calls 'wicked' problems. From the point of view of evaluation, argues Parsons, "the more benign/tame or 'well-structured' a problem, the more it is a suitable case for instrumental, technical rationality, and the more wicked and ill-structured it becomes, the more ill-suited is instrumental, technical rationality".

An interesting parallel is the debate within Operational Research/Management Science about 'soft' operational research (see, for example, Rosenhead, 1989). Here the argument has been that an increasingly formal and mathematicised style of analysis has taken the subject away from its roots as a multi-disciplinary, problem-centred approach to answering difficult and important questions about how organisations should tackle problems. Although strongly quantitative, operational research has undoubtedly had major successes and continues to be of value in the right context. However, the dominance of the quantitative aspect has threatened to marginalise operational research in debates about major strategic or social issues, because it was not well-suited to reflecting evaluations of competing alternatives. The soft operational research movement has sought to create a more balanced portfolio of approaches to problem-solving with more emphasis on process and facilitation of debate between stakeholders.

Moving on to institutional settings, analytical frameworks differ with regard to where in the decision context they situate evaluation, which in turn means for whom the evaluation knowledge is considered 'good'. Cost-benefit analysis for example, operating in the framework of neo-classical economics or public choice, tends to produce knowledge, claims Parsons, that is useful for those "deploying economic discourse or the language of rational self-interest" Approaches relying on interpretivism or critical realism on the other hand consider themselves more as participatory to a process of decision-taking which is based on communicative rationality.

Finally with reference to assumptions concerning welfare, it is well known, for instance, that cost benefit analysis makes some very strong assumptions about social welfare comprising the sum of individual welfare and being a reflection of the aggregate sum of the individual's 'willingness to pay', which is clearly one and not necessarily the only possible definition of what social welfare comprises. Furthermore evaluation strategies differ as to the role they assign to the market regarding social welfare, but also with respect to the extent to which they are driven by considerations about efficiency, economy and effectiveness, or considerations about equity and ethics.

## ICCR WORKING PAPER 407

Several problems can arise by failing to be clear about the underlying assumptions of analytical frameworks used in evaluation. One frequent result is the subsequent failure to be clear about the objectives of evaluation exercises. This is a typical problem in multi-governance settings, like the European Union: the elaboration of policy programmes, and, subsequently, of evaluation tenders, represents itself a complex and often ill-structured process of bringing different and often contradictory objectives under the same hat. Another possible outcome is serious misunderstandings between those who commission and those who are assigned the task of evaluation.

Perhaps the most serious problem is the failure to understand or rightly interpret the results of an evaluation exercise and, in the case of a multi-tier evaluation exercise, to integrate the various results. Considering that policy analysis often necessitates such multi-tier evaluation exercises, it would seem that what often comes under the diagnosis of 'lack of co-ordination' is not simply a problem of organisation, but fundamentally also a problem in establishing a basis for 'reflective conversation'. The latter is only possible if at least a minimum level of common understanding is available.

*Tools are not just tools.* The second dimension that is often not given adequate consideration concerns the implications of using specific tools, in particular statistical methods, for the object of study. As Haight (2000) notes, "a statistical tool, like any tool, needs to be used carefully and wisely if it is to be effective". There are two dimensions to this. The first is that a minimum and up-to-date knowledge of statistics is necessary if these are applied: Haight lists several examples which show that evaluation can go wrong due to the lack of statistical knowledge among those who apply it. Statistics is itself a science and in that relies on a set of assumptions. The evaluator needs to be aware of these prior to specifying an evaluation design.

The second dimension has to do with the "choice among relevant assumptions, data and methods of analysis". Haight argues that this choice has little to do with intuition or with theory. We would tend to agree that it has little to do with the theory of statistics, however, we would contend, it has much to do with social theory (Marsh, 1983). In order to be able to specify hypotheses and assumptions, it is important to have a certain understanding of the object under study. For policy-relevant issues, whether at the project or the programme level, this in turn requires a comprehensive knowledge of the policy in question, the decision-making context but also the role of policies as sets of interventions in the world of social relations.

The same arguments can be made also for tools like cost-benefit or multi-criteria analysis. Beuthe (2000) traces the methodological development from cost-

## ICCR WORKING PAPER 407

benefit (CBA) to social cost-benefit (SCBA) to multi-criteria (MCA) analyses (horizontally as well as vertically, i.e. within each methodological discipline) as a series of incremental attempts to overcome problems that are not solely theoretical but also carry serious practical implications. Thus one major problem with cost benefit analysis is its theoretical reliance on market values and by extension shadow prices; the more flexible design, on the other hand, of multi-criteria analysis, can increase the likelihood of double counting. Both methods face problems with the specification of weights to apply to different criteria, albeit in different ways: cost-benefit analysis in view of the difficulties involved in measuring reliably the 'willingness to pay'; multi-criteria analysis in adopting a 'subjectivist' approach to this and relying on the decision-maker or a round of experts to determine how important any particular type of good or impact is for social welfare.

### Generic Evaluation Frameworks

The consideration of the two dimensions 'stage of decision-making' and 'level of analysis' has proved useful for characterising the scope of evaluation and for the specification of tools suitable to different types of evaluation exercises; in other words for the elaboration of analytical frameworks of integration of evaluation methods.

There are various such frameworks already available. In this section we review some of those developed by government offices at national or European levels; and the situation in transport in this connection.

#### *SEM 2000 Programme and good practice evaluation guidelines*

In the late nineties the Commission launched an initiative called 'Sound and Efficient Management 2000', the objective of which has been to elaborate a framework for carrying out evaluations of Community programmes. One of the first outputs of this programme was the *Good Practice Evaluation Guidelines Handbook* (1997) produced by DG XIX, which we review below. A more recent publication has been the MEANS guidelines for evaluating socio-economic programmes which is described in the following section.

The good practice evaluation guidelines apply to programmes involving EU expenditure at the ex-post or intermediate stage. Many of the issues addressed are however also relevant for policy evaluation. The Guide is organised in five chapters. The first chapter defines what evaluation is and what it is not; and discusses the reasons for carrying out evaluation at programme level and at European level. The second chapter discusses key concepts and definitions (what

## ICCR WORKING PAPER 407

can be evaluated; what issues are raised by evaluation; who is involved in evaluation; what types of evaluation exist). The third chapter is a guide about how to prepare and manage evaluations and drawing up terms of reference. The fourth chapter is about the technicalities of conducting evaluation, including evaluation designs, data collection techniques, and data analysis techniques. Finally the fifth chapter is about the dissemination and use of evaluation.

What is significant about this guide is that it makes a strong point about the need to be explicit about a programme's 'intervention logic', defined as "the conceptual link from a programme's inputs [the human and financial resources devoted to it], to its outputs [with reference to its operational objectives], and, subsequently, to the achievement of the programme's results [initial effects relating to specific objectives] and outcomes [long-term impacts relating to general or 'high-level' objectives]" (op. cit., p.16).

The Guide also suggests that the question to be addressed to evaluation and, in turn, the latter's analytical agenda, can only be set after the intervention logic of the programme is clarified and the various stakeholders consulted. In other words deliberation among relevant actors has to occur prior to evaluation, if the latter is expected to fulfil different objectives, or if the agency commissioning the evaluation understands itself as representing the public interest.

With respect to methods for data collection, the Guide identifies six: surveys, case studies, natural observations, expert opinion, review of programme documents and literature reviews. With regard to data analysis techniques, it discusses statistical analysis, the use of models, non-statistical analysis and judgemental techniques.

On the use of models, the Guide underlines that "the main point to bear in mind about the use of models in evaluation is that it is important to determine the assumptions upon which the model is based, in order to understand and interpret correctly the information derived from it" (p.57). Four types of model are presented: input-output models, micro-economic models, macro-economic models and statistical models.

Cost-benefit analysis, cost-effectiveness analysis and multi-criteria analysis are classified as judgemental techniques of data analysis. The guide does not give any specific recommendations about the technicalities of these methods (unlike national administration handbooks, see below). However it does point out that caution is called for when deciding, for instance in cost-benefit analysis, about how to indirectly monetise social costs and benefits; the use of market prices; the establishment of shadow prices as well as of the discount rates.

## ICCR WORKING PAPER 407

### *MEANS guidelines for evaluating socio-economic programmes*

The MEANS programme stands for 'Means for Evaluating Actions of a Structural Nature' and is a global programme funded by DG XVI (REGION) for the purpose of "improving the quality and utility of evaluations performed within the framework of economic and social cohesion policy" by devising "a coherent set of methods for addressing a wide range of evaluation problems" (MEANS Collection, Vol. 1, p.5). The outputs of the programme have been summarised in six volumes all published in 1999:

- Vol.1: Evaluation design and management
- Vol.2: Selection and use of indicators for monitoring and evaluation
- Vol.3: Principal evaluation techniques and tools
- Vol.4: Technical solutions for evaluation within a partnership framework
- Vol.5: Transversal evaluation of impacts on the environment, employment and other intervention priorities
- Vol.6: Glossary of 300 concepts and technical terms

Even though the guidelines elaborated by the MEANS programme focus on socio-economic projects and initiatives that relate to the Union's cohesion policies, the fact that the latter cover a wide range of policy sectors, including transport, energy and environment, renders them particularly interesting for analysis.

MEANS adopts the decision-making cycle and distinguishes among four evaluation functions, namely, structuring, observation, analysis and judgement.<sup>1</sup> It also suggests distinguishing between two main categories of evaluation tools, namely, evaluation tools or techniques suitable for the overall evaluation of a programme or policy; and evaluation tools or techniques suitable for the in-depth treatment of an evaluative question, mostly at the project level. The MEANS classification framework of evaluation tools thus has an eightfold-structure.

*Programme level evaluation.* For the purpose of *structuring* a programme, i.e. for ex-ante evaluation, MEANS suggest the use of four techniques: SWOT analysis, concept mapping of impacts, colour vote and impact matrix.<sup>2</sup>

For *monitoring* the programme the following techniques are available: individual or expert interviews; focus groups; case studies and surveys.

## ICCR WORKING PAPER 407

For data analysis either ex-ante or ex-post, MEANS advises the use of secondary data and its presentation through either tables or graphs or the use of GIS. Alternative techniques include shift-share analysis, the input-output model and the macro-economic model.

Finally for making a judgement on the programme's outcomes, MEANS recommends the use of techniques that allow the consideration of multiple view points, i.e. the use of expert panels or multi-criteria analysis. The authors note that whilst it is of course possible to also use cost-benefit and cost-effectiveness analyses, the latter "do not have the flexibility required for taking into account the complexity of a judgement on an entire socio-economic programme" (Vol. 3, p.115). Benchmarking is a better alternative. So are SWOT analysis and colour vote which are as applicable to ex-post programme evaluation as they are to ex-ante programme structuring.

*Project level evaluation.* For project evaluation or the 'in-depth' treatment of an evaluative question which is possible only when the evaluative question "concerns a single intervention or a small number of similar interventions, when the public concerned is homogeneous and when there are few effects to evaluate" (op. cit. p.129), the tools available are clearly more sophisticated, but it is precisely this higher level of sophistication that makes them applicable only under very specific conditions.

For the purpose of structuring or designing the project, two techniques are proposed: the Logical Framework and METAPLAN. The colour vote discussed above for programme structuring is applicable also to project design.

With respect to monitoring implementation the same tools that applied to programme evaluation apply also to project evaluation.

The tools applicable to data analysis at the project level include variance analysis, regression analysis, comparison groups, case studies and group interviews as well as the Delphi survey. With the exception of the latter all these tools can be applied both with ex-ante and with ex-post evaluations.

Finally, tools for making a judgement at the project level include cost-effectiveness analysis, benchmarking, cost-benefit analysis, multi-criteria analysis, the expert panel, the Delphi survey and the colour vote.

## ICCR WORKING PAPER 407

*Indicators.* The MEANS framework proposes standard indicators for various fields of application, namely:

- For seven domains, namely, transport infrastructure, energy infrastructure, training, tourism, fisheries, research and technological development and agriculture and rural development;
- For the five priorities of the Structural Funds, namely equal opportunities, the environment, information society, competitiveness of SMEs and enterprises in general and urban development;
- For three major aims, again reflecting the overall goals of the Union's cohesion policies, namely, economic development, employment and quality of life.

In turn, the framework distinguishes between resource, output, result and impact indicators, as well as between programme indicators (related to the intervention and its effects) and context indicators (relating to the assisted area).

Thus for example, in the case of construction of a motorway section and at the programme level,

- output indicators are: compliance with project duration and the km of new motorway;
- result indicators are: the equivalent straight-line speed between A and B;
- impact indicators are: traffic flow of vehicles using the new infrastructure after one year; total journey time saved by users after one year; number of traffic accidents on the motorway after one year; % traffic between A and B using the same infrastructure; and number of houses suffering from traffic noise.

Context indicators for the same example are as follows:

- output indicators are: km of motorways per million inhabitants in the area (a measure of endowment);
- result indicators are: the average equivalent straight-line speed to and from all relevant urban centres in the area;
- impact indicators are: traffic flow in the area; traffic accidents in the area; % of managers in area who declare that road accessibility is a major constraint for their firm; number of dwellings in the area, and hectares of natural sites in the area.

## ICCR WORKING PAPER 407

### *The UK Green Book on appraisal and evaluation in central government*

The HM Treasury of the UK issued a green book on evaluation in 1991. This was updated and enlarged in 1997. Besides these guidelines, each department has developed their own technical guidance for appraisal.

The Green book applies to all administrative actions related to policies, programmes and projects conducted by all government departments. It is at the same time a technical guide on cost-benefit and cost-effectiveness analysis. The objectives of evaluation and appraisal are defined as learning from decisions already taken and using this knowledge as input for improving future decisions.

The guidelines stress that appraisal and evaluation are stages in the general management of projects, programmes and policies. The formal management process followed by most of the departments is called ROAMEF, which stands for "rationale, objectives, appraisal, monitoring, evaluation and feedback":

- 'Rationale' provides justification for the intervention;
- 'Objectives' state what the project is designed to achieve;
- 'Appraisal' is the ex-ante assessment of the project;
- 'Monitoring' is the systematic collection of financial and management information during implementation;
- 'Evaluation' is the process of assessing the impact of a project while it is in operation or after it has come to an end, and
- 'Feedback' involves sending the evaluation reports to all the concerned parties and using the results in further policy-making.

The Green Book uses appraisal to refer to ex-ante analysis and evaluation to ex-post analysis.

Appraisal is defined as "the analysis of the costs and benefits which should underlie the final policy or executive decision". It should be an assessment of value for money in terms of the national interest. Good appraisal entails:

- Setting clear objectives;
- stating alternative ways of achieving them;
- estimating and presenting the costs and benefits of each potentially worthwhile option;
- taking full account of associated risks and uncertainties, and
- providing a framework for rational about the limited use of resources

Appraisal should also consider the questions of equity, planning feasibility, prior commitments and implications on other parts of the economy.

## ICCR WORKING PAPER 407

The core of the appraisal analysis in the UK Green Book is the cost-benefits analysis. The guidelines stress the use of a broad view of cost-benefit analysis, to include indirect and long-term effects as “the government is concerned with the national interests and concerns, including those of taxpayers and users of public services”. A matrix approach is recommended in cases where several different kind of impacts are affecting different groups of people or business.

Evaluation defined as ex-post analysis constitutes “a retrospective analysis of a project, programme, or policy to assess how successful or otherwise it has been, and what lessons to learn from it in the future”. The steps in an evaluation are:

- Establish exactly what is to be evaluated and how the past outputs can be measured. The rationale aims, objectives and outputs should be clearly outlined with the objectives and outputs being quantified to the extent possible. Two types of outputs have to be taken into account, firstly the long term output that corresponds to the policy aims, and secondly the immediate or short term output.
- Choose alternative stages of the world, i.e. define scenarios.
- Compare the actual output with the targeted output and with effects of the chosen alternative state. The methodologies used for comparison are very similar to those proposed for appraisal. The difference is that whilst evaluation makes use of actual data, appraisal relies on projections or forecasts. This stage of evaluation should also include the consideration of control groups.
- Present the results and recommendations. The results should summarise, why the output differed from that foreseen in the appraisal, how effective was the policy in achieving its objectives and why, its cost-effectiveness, and what the results imply for policy decisions.

Cost-benefit analysis is not an essential part of evaluation as ex-post analysis. The Green book recommends instead the use of cost-effectiveness analysis.

The Green Book also provides technical guidance on the usage of cost-benefit and cost-effectiveness analysis. It recommends a six per cent real public sector rate of return for discounting. The guidelines state that for all the appraisals where costs and benefits cannot be valued, valuation techniques describing the willingness-to-pay and willingness-to-accept of these costs and benefits should be used. These could be based on ‘revealed preference’ based on hedonic pricing or wage differentials, or on ‘stated preferences’ such as contingent valuation techniques. Where valuation problems exist, a matrix approach can be used to present the data. In fact a matrix approach or a Logical Framework approach is

## ICCR WORKING PAPER 407

used widely in transport where environmental assessments are required and distributional impacts may be more important.

A major trend witnessed in the UK under the Blair Government has been a shift to a broader frame of reference for evaluation studies. The Department of Transport for instance is currently working on the elaboration of new guidelines for the planning and evaluation of multi-modal studies. These are expected to facilitate multi-modal transport planning at the level of corridors and large urban areas.

### *US General Accounting Office*

For the US General Accounting Office (GAO) the efficiency, effectiveness and economy of federal programmes and policies are part of strategic plans.

In the early 1990s the Planning Evaluation Management department of the GAO issued various manuals to assist evaluation:

- The Evaluation Synthesis (3/92)
- Designing Evaluations (5/91)
- Case-study Evaluations (11/90)
- Prospective Evaluations(11/90)
- Using Structured Interview Techniques (7/91)
- Quantitative Data Analysis (6/92)
- The Evaluator's Guide to Assessing Agency's Annual Performance Plans (4/98)

The *Designing Evaluation* manual outlines various strategies for evaluation of both programmes and policies. The crucial factor is considered the kind of question being addressed – descriptive, normative or impact type. A descriptive question provides information about specific conditions or events. A normative question compares an observed outcome to an expected level of performance. An impact question can answer questions whether observed questions or events can be attributed to programme operations. Each of these evaluation questions involve different methodological steps. The methods given in the manual are mainly sample surveys, case study, field experiment and making use of available data.

The GAO also recommends the prospective evaluation or ex ante evaluation of projects and policies. The guidelines on *Prospective Evaluation* provide forecasting techniques to assist evaluators. The three basic questions that any prospective evaluation should answer are: empirical – i.e. how has it worked historically?; conceptual – i.e. logically, should it work? – and operational – i.e. how could it work practically? Some of the methods for undertaking the evaluation are experimental tests, demonstration programmes, front end analysis, scenario building, Delphi

## ICCR WORKING PAPER 407

techniques and expert opinion. The steps involved in such a prospective evaluation synthesis are: define the problem, selecting alternatives to evaluate, conceptual analysis, operational analysis, testing key assumptions and presenting the results.

The use of cost-benefit and cost-effectiveness analyses is outlined in a circular by the Office for Management and Budget (OMB). The purpose of this circular is to promote the efficient allocation of resources of the federal government. It provides guidance for conducting cost-benefit and cost-effectiveness analysis and also the discount rates that should be used. It recommends the use of benefit-cost analysis for government project and programmes. It recommends the use of cost-effectiveness analysis when benefits from competing alternatives are the same, or where a policy decision has already been made and benefits need to be specified.

### *World Bank*

In the World Bank the main purpose of economic analysis as stated in the *Handbook of Economic Analysis of Investment Operations*, is "to help design and select projects that contribute to the welfare of a country".

Gwilliam (2000) outlines the evaluation method used in World Bank for appraising projects. He specifies that economic analysis as undertaken in World Bank is much broader than traditional cost-benefit analysis. The Handbook lists ten questions which an economic analyses should answer:

- What is the objective of the project?
- What will happen if it is implemented, and what if it is not?
- Is the project the best alternative?
- Are there any separable components, and how do they go separately?
- Who are the winners and losers?
- Is the project financially sustainable?
- What is the project's fiscal impact?
- What is the project's environmental impact?
- Is the project worthwhile?
- Is this a risky project?

Additionally it is necessary to analyse whether the project is carried out better by the public or the private sector. A minimum twelve per cent rate of return is the threshold for the success of a project. Economic or financial considerations are the most important, but not the sole, for the Bank. Other important considerations are the avoidance of environmentally damaging investments, the ensuring of a widespread distribution of the benefits of projects throughout the national recipient

## **ICCR WORKING PAPER 407**

community, and the avoidance of uncompensated losses by virtue of spatial or occupational displacement resulting from a project.

The national priorities help in identifying the sectors in a country that need to be funded. Based on a sector review, the projects in that particular sector are identified. The projects identified are then submitted to an economic evaluation. A specific project appraisal relies on the Logical Framework technique. The latter indicates the way in which project objectives, project components, and outcomes are related, and identifies the main perceived risks and the elements of the project design to mitigate such risks.

Evaluation in the World Bank is not strictly concerned with the ranking of projects, either within or across sectors, but rather “with establishing that individual investments represent sensible use of resources within the context of the national economies to which they are devoted” (Gwilliam, 2000).

### **Evaluation Frameworks in Transport**

There is no analytical evaluation framework in transport at European level and the existing ones at national level deal mainly with infrastructure planning (modal or multi-modal). In this section we review the existing national frameworks for evaluation in transport and some pieces of European research that could be said to contribute towards the elaboration of a European analytical framework for evaluation in Transport.

#### *National frameworks of evaluation*

Most national administrations follow standard procedures in elaborating masterplans for infrastructure investment. Next to traffic forecasts and consultation with regional actors on infrastructure needs, these tend to rely primarily on cost-benefit and multi-criteria analysis for establishing priorities.

The following points can be made about national frameworks of evaluation in transport:

1. In most countries transport evaluation focuses on infrastructure planning and assessment and in this connection ex-ante programme or project evaluation. In some countries a multi-modal perspective is taken, i.e. masterplans for infrastructure cover both rail and road; in some a modal perspective is taken, i.e. road and rail administrations operate separately. In no country is there ex-post evaluation of infrastructure programmes.

## ICCR WORKING PAPER 407

2. In most European countries no major data or model constraints were identified. The exception was East European countries.
3. Environmental issues are considered in evaluation as part of project assessment and/or as part of programme assessment. Equity, i.e. distributional issues are less often considered with the exception of accessibility.
4. There would appear to be no systematic practices for ex-post project or programme evaluation or for policy evaluation (both ex-ante and ex-post). In the latter connection, the evaluation could be said to be more of a political nature or relying on the commissioning of expertise, whereby the procedures are not very transparent.
5. Elements relating to the more general transport policy environment (like regulations) are considered either for establishing reference scenarios or for 'correcting' assessments with respect to infrastructure investments. However, once again, there are no systematic procedures in this connection.
6. Regions are in particular responsible for regional planning and public transport and they are not obliged to use the methods of evaluation used at national level. The interfaces between the national and regional levels are unclear; so are those between the national and European levels.
7. There would appear to exist no harmonised criteria about prioritisation, phasing and forecasts.

### *Inputs from European research*

Beginning with the 3<sup>rd</sup> Framework Programme, the transport RTD programme has funded several projects and concertation activities aiming at contributing to the development of standard guidelines for strategic and project evaluation in transport.

The first attempt to integrate the results of these research activities was made by the Transport Investment Evaluation group in 1995 (EC and Transport Investment Evaluation Group, 1995). They reviewed the results of several projects of the 3<sup>rd</sup> Framework Programme, in particular of EURET, which examined appraisal practice in the roads sector in the (then) twelve members of the Union, of projects under the APAS/STRATEGIC programme that examined railways, inland waterways and nodal centres for passengers and for goods, and of the APAS/ROAD study that explored socio-economic evaluation methods.

## ICCR WORKING PAPER 407

The majority of the above project focus primarily on infrastructure investment. Thus the guidelines elaborated by the Transport Investment Evaluation Group are best seen as applying to the project level and to infrastructure. Furthermore the Group defines appraisal or evaluation – the terms are often used interchangeably – strictly as comprising the scientific or technical part of the analysis, and thus differently than the more generic frameworks of evaluation reviewed in the previous sections.

The key to appraisal is the specification of the impact matrix. The three key criteria for selection of projects are political assessment, socio-economic appraisal and technical evaluation. Which of these three criteria is given higher importance depends on the objective of the project. At the heart of transport project appraisal is the modelling process through which the impact of each project on travel behaviour is assessed. Typically, the traditional transport forecasts should provide information on:

- direct impacts on users - travel time, operating cost, safety, etc.
- construction and maintenance cost
- local environmental impacts - noise, pollution, etc.
- broader strategic impacts - employment, environmental effects, etc. at the regional and the global level.

Key questions for appraisal are:

- what is the relevant set of impacts to be included ?
- how are the impact variables to be measured ?
- how are the impacts weighted to reflect their relative importance ?
- how are the results presented for use in decision making ?

The essence of the conclusions of the group's consultations was that appraisal cannot be seen as an isolated "end-state" activity applied only to fully specified projects immediately prior to a decision about investment. Rather the appraisal should form part of the entire project implementation process, i.e. from project description, financial and socio-economic analysis, risk and uncertainty, evaluation and presentation:

The project identification phase (phase 1) calls for the clear specification of project objectives and of the relationship of these to broader programme and policy objectives.

For the actual evaluation or project appraisal (phase 2), the Transport Investment Evaluation Group recommended the use of three tools, namely, financial analysis, cost-benefit analysis and multi-criteria analysis.

## ICCR WORKING PAPER 407

Financial analysis ought to be used to establish the financial viability of the project. It was judged particularly relevant for the assessment of nodal centres, rail investments and of projects involving public-private partnerships. Socio-economic assessment – through cost-benefit or multi-criteria analyses -- is necessary to see if the project meets the broad programme objectives. Multi-criteria analysis is recommended for the appraisal of TEN proposals.

The next phase (phase 3) involves risk and sensitivity analysis. This is important as transport projects often involve very high initial capital expenditure while their returns are generated over a long period of time. They are also frequently dependent on socio-economic conditions which are difficult to forecast.

The presentation of results (phase 4) should include:

- The project identification and of relevant assumptions and hypotheses;
- A traffic model;
- The project engineering design, including time periods for construction, alternative options and financing options;
- Traffic forecasts under different scenarios;
- The results of the appraisal / financial analysis per option and per scenario.
- The results of the risk sensitivity analysis.

The above guidelines provided an analytical framework for several studies undertaken in the 4<sup>th</sup> framework programme, specifically for those of the strategic transport RTD programme. It is beyond the scope of this paper to provide an overview of this research. Suffice here to note some general trends:

1. With the 4<sup>th</sup> Framework Programme attention shifted towards the consideration of policy measures other than those related to infrastructure as well as towards strategic assessment. The 5<sup>th</sup> Framework Programme which only recently started displays similar tendencies.
2. Strategic transport research displayed four thematic priorities (cf. Giorgi and Pohoryles, 1998): (a) information systems and data; (b) scenarios; (c) impact assessment and (d) policy assessment. Across all four themes, the emphasis has been on the development or elaboration of methods (and models) relevant for the evaluation for transport problems or issues of European value.
3. Several projects have sought to integrate the use of standard evaluation techniques, like cost-benefit analysis, multi-criteria analysis, environmental analysis and scenarios, through a decision framework analytical approach (Beuthe, 2000).

## ICCR WORKING PAPER 407

In order to exemplify the latter point which is of particular relevance to the subject of this paper, we consider some examples:

For instance, EUNET proposes three distinct modules for assessment, namely, a socio-economic cost benefit analysis (SCBA) module, a financial analysis module and a multi-criteria analysis module:

- The SCBA module provides the outputs for rating a project, namely, NPV, benefit-cost ratio and IRR. Besides it provides monetary values on the investment costs, operating and maintenance costs, vehicle operating costs, time, safety, user charge, regional air pollution and global air pollution. These values are given for each party concerned in a project, user, operator, developer and government.
- The financial analysis module includes information of interest to a private investor.
- The MCA module looks at criteria like noise, landscape, land take, water pollution, local air pollution, output, employment, other policy synergy, regional accessibility, social cohesion and accessibility.

The EUNET decision framework leaves it to the decision-maker to prioritise the criteria and, accordingly, the order of application of different modules and the ranking of the results.

Along similar lines, Turro (1999) advocates the separate consideration – in part with different tools – of efficiency, sustainability and cohesion criteria in the assessment of the TEN.

- *Efficiency*: This is assessed by the results of a harmonised CBA. The internal rate of return (IRR) should be a minimum of 5 percent. The efficiency of a project can be established through an economic evaluation that compares costs and benefits to determine whether a project represents an efficient use of resources for the society as a whole. This is different from financial evaluation that looks at the cash flows that would accrue from a project. The benefits components in CBA are basically the generic indicators like travel time savings, safety improvements and transport investment appraisal. Another factor to be taken into account are the network effects. That is the effect of a completion of a missing link in one section on the whole network. The evaluation should also take into account the redistribution effects. The most important aspect in case of TENs is the trans-border projects where the costs and benefits incurred by each country can be analysed separately. Otherwise Turro recommends not making any

## ICCR WORKING PAPER 407

distinction between users and non-users according to nationality in the economic evaluation of the TEN as the latter are European projects.

- *Sustainability*: Sustainability criteria cover environmental effects not covered by the standard CBA procedure. They should be treated separately from efficiency analysis. Turro recommends a two-tier strategy: firstly, the carrying out of a strategic environmental assessment (SEA) on the whole multi-modal network; secondly, the objective measurement of environmental effects at project level.
- *Cohesion*: The criteria for cohesion relate to a number of factors like accessibility, job creation, integration effects and effects on social cohesion. The minimum accessibility to the basic networks is defined as the weighted average of the time required to travel from one point in question to the basic transport infrastructure node (i.e. motorway interchanges, railway stations, ports and airports). The objective is to calculate the effect of TENs on areas poorly endowed with transport infrastructure. A direct effect from the implementation /construction of TENs can probably be the same as of any other sector of the economy. However the indirect effect of job creation will probably come from their effect on productivity. Lower transport costs and improves service will probably mean that the economy has greater productive potential. High rates of return should be expected so they can induce more long term employment than alternative investments.

The separation of environmental impact analysis from the standard CBA procedures is also encouraged by the project appraisal method proposed by the TINA Secretariat which has been in charge of delineating the multi-modal infrastructure network of corridors in Central and Eastern Europe and in the Baltic States which will form the backbone / extension of the TEN in the enlarged Europe (TINA, 1999).

Complementary to the above is the CODE-TEN strategic assessment method. The CODE-TEN DECODE method, which like EUNET advocates the combined use of evaluation techniques, recommends the use of scenarios for establishing and analysing the spatial distribution of impacts and indirect and network effects in the long-term. In DECODE and for the purpose of the strategic assessment of infrastructure investment programmes, like the corridors, the unit of assessment is the set of policy packages formed in a three-dimensional space for the year 2015: firstly, the socio-economic and integration scenarios; secondly the transport policy scenarios; and thirdly, the infrastructure strategies.

In conclusion we could state that at the European level there is a gradual movement towards the better strategic incorporation of policy concerns in

## **ICCR WORKING PAPER 407**

evaluation and that this is reinforcing attempts to better co-ordinate evaluation and policy-making. This, in turn, necessitates a better understanding of evaluation techniques and of possible ways to integrate their results.

### **Towards a New Harmonised Framework for Transport?**

Is it at all possible to develop one universal evaluation method or framework for application in the field of transport that satisfies the various user needs as well as the objective demands of policy? An equivalently important question is, would this be desirable even if possible?

Parsons (2000) claims that an integration is possible and desirable if understood as a process of clarification which, in turn, is important for 'reflective' communication and possibly consensus-building. It would be a mistake to equate integration with the achievement of a value-free, or worse, value-uniform policy; or to couple this with the denial of conflict: policies, however well designed, are unlikely to just have winners.

It is possible to develop general guidelines for policy and project evaluation and specific ones for application to any particular sector. This would set standards as to what is a good and professional evaluation method and would assist in the interpretation of apparently contradictory results, especially where these are the result of the application of different methodologies. Furthermore it would help 'rationalise' the assessment process and concurrently identify or anticipate potential conflicts of interests (or of values and ideas) thus helping towards the building of consensus.

### **Notes**

<sup>1</sup> It is obvious that each of the above four objectives correspond to different phases of the decision-making process: the 'programme structure' objective corresponds to the policy design phase; the 'observation' objective to the implementation stage, whilst the 'analysis' and 'judgement' objectives to the phase following the completion of implementation. The function or objective of the evaluation is used to classify evaluation tools. However MEANS also uses the more classical decision model to distinguish between ex-ante, mid-term and ex-post evaluations when classifying evaluation exercises with reference to the time of commissioning.

<sup>1</sup> All these methods are described in detail in the MEANS Volume 3.

## ICCR WORKING PAPER 407

### References

- Atkinson, R. and Cope, S. (1994), 'Urban Policy Evaluation: Science or Art?', Paper presented at the ESRC Research Seminar on Urban Policy Evaluation, Cardiff
- Banister, D. and Berechman, J. (eds.) (1993), *Transport in a Unified Europe*, Amsterdam, North-Holland
- Banister, D. and Lichfield, N. (1995), 'The Key Issues in Transport and Urban Development', in Banister, D. (ed.), *Transport and Urban Development*, London, E&FN Spon
- Beuthe, M. (2000), 'Methods of Transport projects Evaluation: From Cost-Benefit to Multi-criteria and Decision Framework', Paper presented at the first TRANSTALK workshop, May 29-31 2000, Brussels, forthcoming as publication
- Beuthe, M. *et al.* (2000), 'A Practical multicriteria methodology for assessing Public Investments', *Socio-Economic Planning Sciences*, No. 34, Elsevier
- Chelimsky, E. and Shahdish W.R. (eds.) (1997), *Evaluation for the 21<sup>st</sup> Century*, London, SAGE
- CODE-TEN Final Report, (2000), *The DECODE Method – Theory and Application*, forthcoming as publication
- Cusco, V.P., DG TREN, EC (2000), 'Recent Development of the Common Transport Policy', Paper presented at the first TRANSTALK workshop, May 29-31, Brussels
- Dasgupta, P. (1982), *The Control of Resources*, Great Britain, Harvard University Press.
- Engel, U. and Pötschke, M. (1998), 'Willingness to Pay for the Environment: Social Structure, Value Orientations and Environmental Behaviour in a Multi-level Perspective', *Innovation*, Vol. 11, No. 3
- European Commission (1992), *The future development of the common transport policy - A global approach to the construction of a Community framework for sustainable mobility*, COM(92) 494, Brussels
- European Commission (1993), *European Transport Policy in the 90s*, Brussels
- European Commission (1993), *The future development of the common transport policy. A global approach to the construction of a community framework for sustainable mobility*. Bulletin of the European Communities, Supplement 3/93
- European Commission (1994), *Strategic Environmental Assessment – Existing Methodology*, Brussels, EC
- European Commission (1995), *The Common Transport Policy Action Programme 1995-2000*, Brussels
- European Commission (1995), *The Trans-European transport network; transforming patchwork into a network*, Brussels

## ICCR WORKING PAPER 407

- European Commission (1995), 'Amended proposal for a European Parliament and Council Decision on the Community guidelines for the development of the trans-European transport network', *Official Journal C97*, Vol.38
- European Commission (1997), *Case Studies on Strategic Environmental Assessment; Final Report: Volumes 1 & 2*, Brussels, EC
- European Commission (1996), APAS-Strategic Transport, *Cost-benefit and multi-criteria analysis for nodal centres for goods*, Brussels, EC
- European Commission (1997), *Financial and Economic Analysis of Development Projects*, Luxembourg, EC
- European Commission (1996), EURET-Concerted Action 1.1, *Cost-benefit and multi-criteria analysis for new road construction*, Brussels, EC
- European Commission (1999), PHARE – *Transport Infrastructure Needs and Assessment*, TINA Secretariat
- European Commission (1999), *MEANS collection– Evaluating Socio-economic Programmes*, Brussels, EC.
- European Commission and Transport Evaluation Group (1995), *Framework for Transport Investment Evaluation*, Brussels, EC
- European Commission, DGXIX, (1997), *Good Practice Evaluation Guidelines Handbook*, EC
- Fischer, F. (1995), *Evaluating Public Policy*, Chicago, Nelson hall Publishers
- Freeman, H.E.; Rossi, P.H. and Wright, S.R. (1980), *Doing Evaluations*, OECD, Paris
- Giorgi, L. and Pohoryles, R. (1998), *TENASSESS Deliverable 5, Interconnections Among Tasks: A Guide to the Fourth Framework Strategic Transport Research Programme*, Vienna / Brussels, ICCR / EC
- Glaister, S. et al (1998), *Transport Policy in Britain*, London, MacMillian Press Ltd.
- Goodwin, P. and Wright, G. (1998), *Decision Analysis for Management Judgment*, 2nd. edition, Wiley
- Gwilliam, K. (2000), 'Transport Project Appraisal at the World Bank', Paper presented at the first TRANSTALK workshop, May 29-31 2000, Brussels, forthcoming as publication
- Haight, F. (2000), 'Evaluation of Projects and Programmes: Principles and Examples', Paper presented at the first TRANSTALK workshop, May 29-31, Brussels, forthcoming as publication
- Hogwood, B. W. and Dunn, L. A. (1984), *Policy Analysis for the Real World*, Oxford, Oxford University Press.
- Homeyer, H.von, (2000), 'Enlarging EU Environmental Policy-The Challenges of Flexibility and Integration', Paper presented at the first TRANSTALK workshop, May 29-31 2000, Brussels, forthcoming as publication
- Hoon Oum, T. et al. (eds.) (1997), *Transport Economics; Selected Readings*, Harwood Academic Publishers

## ICCR WORKING PAPER 407

- Keeney, R.L. and Raiffa, H. (1976), *Decisions with Multiple Objectives*, Wiley.
- Layard, R. and Glaister, S. (Edited) (1996), *Cost-Benefit Analysis*, Cambridge University Press
- Leleur, S. (1995), *Road Infrastructure Planning*, Denmark, Polyteknisk
- Mackie, P. Nellthorp, J. Pearman, A. (2000), 'Appraisal Issues for Trans-European Network Projects', Paper presented at the first TRANSTALK workshop, May 29-31 2000, Brussels, forthcoming as publication
- McGowan, F. (2000), 'The EU Policy-Making Process', Paper presented at the first TRANSTALK workshop, May 29-31 2000, Brussels, forthcoming as publication
- Nellthorp J., Mackie P.J. and Bristow A.L. (1998), *Measurement and valuation of the impacts of transport initiatives*, Deliverable D9, (Restricted), EUNET Project - Socio Economic and Spatial Impacts of Transport (Contract: ST-96-SC.037), Institute for Transport Studies, University of Leeds.
- Ney, S. (2000), 'Understanding Accessibility', in Giorgi, L. and Pohoryles R. J. (eds.), *Transport Policy and Research: What Future?*, Ashgate (forthcoming)
- Olson David L. (1996), *Decision Aids for Selection Problems*, New York, Springer
- Palumbo, D.J., (ed.), (1987), *The Politics of Program Evaluation*, Sage, Newbury Park, Cal.
- Parsons, W. (1995), *Public Policy: An Introduction to the Theory and Practice of Policy Analysis*, Aldershot, Edward Elgar
- Parsons, W. (2000), 'Analytical Frameworks for Policy and Project Evaluation: From Welfare Economic and Public Choice to Management Approaches', Paper presented at the first TRANSTALK workshop, May 29-31 2000, Brussels, forthcoming as publication
- Pearce, D.W. and Nash, C.A. (1981), *The Social Appraisal of Projects: a Text in Cost-Benefit Analysis*, London: Macmillan.
- Pearce, D. Hett, T. et al., (1999), *Review of Technical Guidance on Environmental Appraisal*, UK Department of the Environment, Transport and Regions (DETR), UK
- Phipps L. et al. (1999), *Evaluating Environmental Schemes – A Catalyst to Accelerate Good Practice*, UK Evaluation Society, UK
- Ponti, M. (1997), *TENASSESS Working Paper on Conflicts*, TRT
- Rambow, G. (2000), 'The EU Enlargement and its impacts on European Policies', Paper presented at the first TRANSTALK workshop, May29-31, Brussels, forthcoming a publication
- Rennings, K. (2000), 'Criteria for Evaluation towards Sustainability', Paper presented at the first TRANSTALK workshop, May 29-31 2000, Brussels, forthcoming as publication
- Rossi, P.H and Freeman, H.E. (1993), *Evaluation : A Systematic Approach*, California, SAGE

## ICCR WORKING PAPER 407

- Ritter, H.W.J and M.M. Webber. (1973). 'Dilemmas in a General Theory of Planning', *Policy Sciences*, Vol. 4, pp.155-169
- Rosenhead, J. V. (ed.) (1989), *Rational Analysis for a Problematic World*, Oxford, Wiley
- Rus G. de, Nach C. (eds.) (1996), *Recent Developments in Transport Economics*, Hants, Avebury
- Sansom, T., Pearman, A. D., Matthews, B. and Nellthorp, J. (1999), *The SITPRO Methodology*, Deliverable 2, SITPRO (Study of the Impacts of the Transport RTD Programme), Brussels, EC
- Sen, A.K., (1997), 'Shadow Prices and Markets', in Layard, R. and Glaister, S. (eds.), *Cost-Benefit Analysis*, Cambridge, Cambridge University Press
- Sugden, R. and Williams, A. (1978), *The Principles of Practical Cost-Benefit Analysis*, Oxford University Press
- TINA Secretariat (1999), *Socio-Economic Cost-Benefit Analysis in the Context of Project Appraisals for Developing a Trans-European Network in Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia*. TINA 015/Final. TINA Secretariat: Vienna.
- Tsamboulas, D. Mikroudis, G. (2000), 'EFECT – Evaluation Framework of Environmental Impacts and Costs of Transport Initiatives', *Transport Research Part D*, No. 5, 2000,
- Turró, M. (1999), *Going Trans-European, Planning and Financing transport network for Europe*, Amsterdam, Pergamon
- UK HM Treasury (1997), *The Green Book – Appraisal and Evaluation in Central Government*, London, The Stationary Office
- UK Department of the Environment, Transport and Regions (DETR), (1999), *Review of Technical Guidance on Environmental Appraisal*, (Pearce, D. et.al.), UK
- UK Department of the Environment, Transport and the Regions, (1999), *Transport and the Economy*, The Standing Advisory Committee on Trunk Road Assessment
- US General Accounting Office, (1991), *Designing Evaluations*, Program Evaluation and Methodology Division, US
- US General Accounting Office, (1998), *An Evaluator's Guide to Assessing Agency Annual Performance Plans*, General Government Division
- US Office of Management and Budget (OMB) Circular A-94, (1992), *Guidelines and Discount Rates for Benefit-cost Analysis of Federal Programs*, US
- US General Accounting Office, (1990), *Prospective Evaluation Methods*, Program Evaluation and Methodology Division
- US General Accounting Office (2000), *GAO's Strategic Plan Framework*, US
- Wallace, H. and Wallace, W. (1996), *Policy Making in the European Union*, New York, Oxford University Press