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ASSESSING OUR EXPERTISE

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European research in the field of transport economics owes a great deal to ECMT activities and initiatives. The full collection of Round Tables and Symposium reports prepared at the instigation of the ECMT provides an encyclopaedic body of knowledge. It bears witness to the vitality of European expertise and is an essential tool of reference for transport economics.

The value and interest of the topics selected has always resided in the fact that they reflect the two-fold dimension of the ECMT -- the dimension of a Conference of Ministers, meaning that the questions raised address immediate and, if possible, future policy concerns, but also a scientific dimension, meaning that the research community's knowledge and expertise are applied to answering these questions, if only partially. Thus, the Round Table reports, including the valuable summaries of discussions, constitute a long-term dialogue between decision-makers and experts -- a dialogue of over 20 000 pages that has been maintained for over 35 years.

The purpose of this brief report will be to take stock of this dialogue. For this exercise to be useful, it must be critical and, more specifically, it must answer the following three questions:

- Has this dialogue addressed the right issues, i.e. those faced by decision-makers?
- Have the experts been able to provide the right solutions?
- Can we identify tomorrow's issues and will we be able to provide solutions?

1. Have we been addressing the right issues?

This is a question that a number of *rapporteurs* were already asked to address at Round Table 100, which was held in 1995 and was specifically devoted to this issue. As I was one of these *rapporteurs* and had chosen to focus on the challenges facing policymakers, I suggested¹ that analysis and comparison showed that there were four main groups of subject areas that the ECMT had been asked to study (or had done so on its own initiative).

These four main subject areas will be described below in the chronological order in which they emerged as policy issues.

Since in the 1960's policy was focused on the optimum allocation of scarce funding resources, the issue of the *evaluation* of investment was given priority, starting with the evaluation of specific projects and then the evaluation of transport policy encompassing co-ordinated investment strategies. This category may be taken to include evaluation-related needs for data on demand or simulations of

1. "Research and Transport Policy" in Transport Economics Research and Policymaking, ECMT, OECD Publications, Paris, 1999, pp.127-134.

demand. Similarly, issues relating to external effects progressively began to emerge in connection with this subject area.

The issues of *pricing policies and investment funding* emerged virtually at the same time. Charges for the use of infrastructure became a much more topical issue since the progressive implementation of a common transport market within the European Community was based on a principle of regulation through competition, in particular between transport modes, which assumed equitable pricing of infrastructure use between these different modes. Again, issues related to the internalisation of external effects also came gradually to the fore as these effects were factored into the pricing system.

The third set of issues appeared very early on in an isolated fashion, but became much more important in the 1980s with the introduction of deregulation policies, particularly in the field of road freight transport. These issues relate to the different forms of operation of the transport market, be it within the same mode or between competing or complementary modes. As a general rule, work in this area deals with means of *regulating the sector*, that is the means of determining levels of transport provision, price formation and, ultimately, levels of demand.

The fourth set of issues relates to ways in which transport policy structures space, that is to say, the impact that policy has on urban configurations, on regional development or on the location of industry. This naturally appears to be less crucial than the two previous subject areas, for these are issues that are only raised once the most urgent investments have been made and a certain level of development has already been attained.

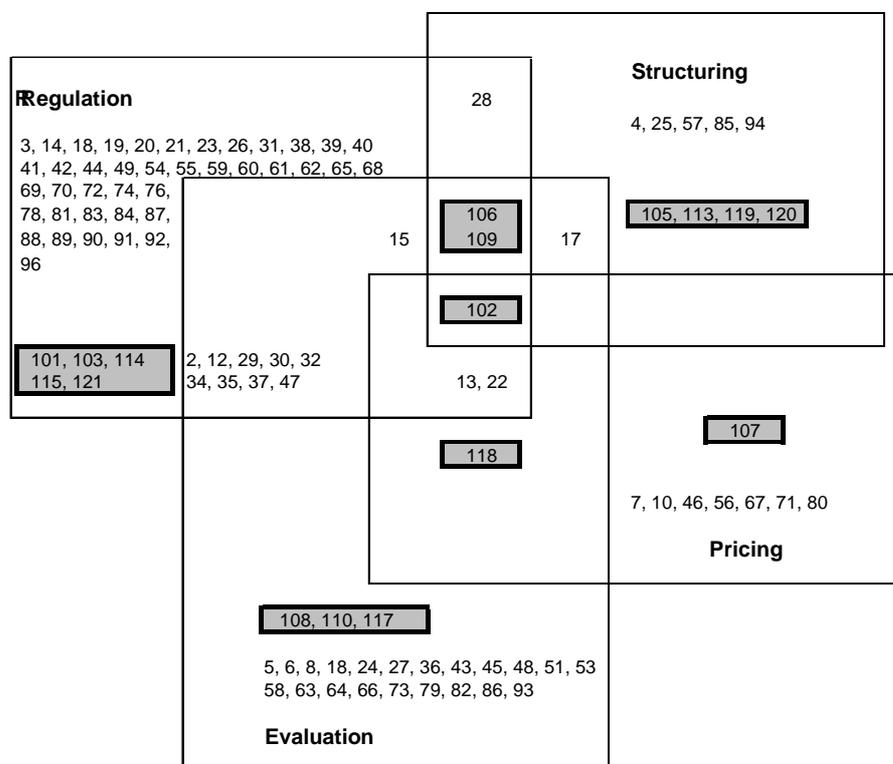
While this classification is by no means exhaustive, it does make it possible to place nearly all the Round Tables in a particular context. Apart from Round Table numbers 1, 50, 75 and 100 devoted to discussion of research options, only two (numbers 77 and 95), given over to very distinctive issues, fall outside of the four subject areas mentioned. The classification does not, moreover, seek to be restrictive insofar as some of the Round Table topics touch on two or more of these four subject areas.

The following diagram² shows these subject areas under the terms of regulation, structuring, evaluation, pricing, which are to be taken in their broadest sense. As pointed out, they form sets that overlap. The Round Tables, identified by their number, are located on the diagram in accordance with their singular or plural reference to the four subject areas. The most recent Round Tables (after No. 100), which are highlighted in the boxes shaded in grey, do not suggest that there has been a significant shift in the pattern of the issues addressed. Other than in the case of “regulation/evaluation, there is little linking of subject areas throughout the period, although some major issues of immediate concern do in fact span two or three.

A pricing policy, for example, which is designed to protect the environment can push up the cost of transport to areas at some distance from development corridors and so obstruct the aim to achieve a well-balanced structuring of space. This means that that pricing is linked to the structuring of space, but also to evaluation since these policies involve making a trade-off between the reputedly positive and negative effects. As a further example, charges for the use of infrastructure can influence modal split and therefore demand and, in the last analysis, may help to shape assessments of alternative investment projects. There is no shortage of other instances of difficulties that have not always been easy to describe or, accordingly, resolve.

2. This diagram is an updated version of the one presented in our Round Table No. 100 report.

Figure 1. The four subject areas
Distribution of Round Tables by subject area



If the diagram above had also covered the sectoral breakdown in documentary classifications (passengers/freight, geographical level, mode), it would have been even clearer that our approaches to subject areas are in most cases seeking to analyse and seldom to synthesise. We are better able to assess two versions of the same project than decide whether to invest in this or that mode or at this or that geographical level. We are not well equipped to take a comprehensive view when assessing plans for national or international infrastructure, still less to judge the consistency of plans involving different modes. Lastly, we are not really used to defining and weighing up the basic choices that have to be made when framing a transport policy, those which will determine how the system will evolve from then on, namely the targets for the sector in terms of economic efficiency, the environmental and spatial objectives; the conceptual framework for assessment; pricing principles; funding arrangements. All these components must be built into a coherent whole.

These issues should occupy central positions on this diagram and call into question the distinction that we have made between the four subject areas. In other words, this analytical tradition has left us ill-prepared to tackle what has now become an overarching concern of our transport policies, namely sustainable development. How can we address this objective unless we include not only the choice of investments (and thus their evaluation), but also the channelling of demand (and therefore pricing), the structuring of space (and therefore spatial equity) and, of course, the regulatory system as a whole?

Obviously, a research programme or Round Table topic cannot be expected to encompass all major aspects of transport policy. In each of these cases, rational inquiry cannot be conducted without dividing a problem into its component parts. However, although general policy issues have to be broken down in order to study them in greater depth, the individual segments defined and the specific

approaches adopted should also be interconnected and compared to see if they constitute a consistent policy.

To illustrate this tendency towards an overly isolated approach to analysing issues, I would like to give a simple and highly topical example that in all likelihood is not unique to France. When a major corridor is saturated or becoming saturated³, it is necessary to address the issue of whether its capacity should be increased. If an economic evaluation is made of an investment, such as widening a motorway or building an additional road along the same given corridor, it is very likely that the social and economic return on the investment will be seen as being very high, for this new stretch of highway is sure to attract considerable traffic and users would stand to benefit in the short and medium term from less saturation.

However, there is an alternative solution to this approach, which would consist of improving the alternative routes through less easily accessible areas, varying tolls over space and time and making the rail mode more commercially competitive. This approach would involve all four of the subject areas that we have mentioned, for it clearly entails *evaluating* this alternative, but also *structuring the territory* in a more balanced way, using *optimum pricing* and introducing *regulatory methods* to make rail more competitive.

It is not easy to determine whether decision-makers bear sole responsibility for this failure to consider an alternative identified under another strategic approach or whether the responsibility lies with the experts who have encouraged decision-makers to continue to treat the investment choices, road-toll policy, intermodal policy and territorial development policy as separate issues.

Beyond this specific example, the above diagram shows that we are *little inclined to address issues using an integrated and ultimately strategic approach*. However, although experts may not always address the right issues, when they do so, are they actually able to provide solutions?

2. Do we have the right solutions?

The lengthy experience on which we can draw provides us with a chronological record of the transport issues that our countries, and therefore our policy-makers, have had to contend with. It enables us to assess to what extent the experts have been able to provide initial solutions to these issues of immediate concern, or at least how responsive research has been to addressing these issues.

3. As is the case for the Rhone Valley south of Lyon.

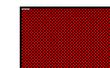
Figure 2. The main uses of transport models and the status of our expertise in using them effectively

<i>Main applications of models</i>	Fields of modelling research									
	Road freight	Rail freight	Multimodal freight	Car passengers	Public transport passengers	Air passengers	Passengers, all modes	Mobility, car ownership	Parking	Geographic scale
To plan and determine appropriate size of transport infrastructure										Urban
										Interurban
To manage and optimise transport networks and infrastructure										Urban
										Interurban
To simulate spatial changes generated by changes in transport supply										Urban
										Interurban
To explore major trends of the future										Urban
										Interurban
To simulate and evaluate transport-related environmental issues										Urban
										Interurban

 Not applicable

 We believe we have expertise

 Beginning to have expertise

 Do not yet have expertise

To assess these factors, we must no longer refer to major transport policy issues but adopt a more precise approach based on what may be described as demand for modelling. This consists in determining the stock of models currently available in the field of transport economics¹ and in assessing the extent to which they can provide answers to the main questions that policy-makers ask before making decisions. Though obviously very varied, these questions can be divided into five areas of concern which have progressively emerged as central issues in the area of transport policy:

- To plan and determine the appropriate size of transport infrastructure.
- To manage and optimise transport networks and infrastructure.
- To simulate the spatial changes generated by changes in transport supply.
- To explore the major trends of the future.
- To simulate and evaluate transport-related environmental issues.

A further distinction must also be made depending on whether the issue is being addressed at the urban or interurban level, for the same models are not used in both cases. In addition, the models used more often than not concern a specific segment of the transport market. These market segments are shown in the columns in the upper half of Diagram 2, and the squares below show the degree of expertise of the scientific community in each case (apart from the black squares which provide no indication).

It can be seen that we have classified many cases in the “Do not yet have expertise” category. Thus, in all areas concerning the impact of interurban transport supply on the structuring of space, transport economics has not as yet developed models capable of simulating these structuring effects adequately. Similarly, we have relatively few tools for conducting a detailed simulation of the impact of parking policy in an urban environment.

A whole series of issues are classified in the category “Beginning to have expertise”. This means that the research community has developed the relevant models, but that they are not yet fully tested or widely used. These are fields in which research programmes have recently been developed and that can be considered to have produced effective results. This is the case in particular of long-term modelling that makes prospective simulations possible, and also models that can simulate the environmental impact.

Lastly, there are the issues placed in the category “We believe we have expertise”. This includes, of course, the traditional demand forecasting models, which were developed long ago in order to tailor new infrastructure to needs and evaluate it correctly.

We should point out that the expression “We believe we have expertise” reflects not only a healthy attitude of humility on the part of experts, but also the fact that there have been many difficulties in forecasting traffic and more generally in making assessments, for the forecasting errors have not only concerned demand but also costs.

1. In order to identify this supply, we propose to use a classification based on a grid developed for a research project currently in progress at the “Economie et Humanisme” research centre (<http://www.economie-humanisme.org>). This project is managed by Eric Baye and Philippe Blancher.

Let us confine ourselves to a single example that aptly illustrates traffic forecasting errors. A report was recently issued by Standard & Poor's² on investment in toll roads on different continents. Out of the 32 cases studied, four showed that traffic was slightly higher than had been forecast, while in all the other cases traffic was lower than originally forecast and in twelve cases more than 40% lower!

It is clear that Standard and Poor's addressed these issues because they have a direct bearing on the potential for growth in public-private partnerships (PPPs) relating to the financing, construction and operation of transport infrastructure. The uncertainties relating to forecasting models and the risk premium that private operators are entitled to add to the internal rate of return on a given project are obviously linked. This would suggest that with margins for error as large as these, coupled with current rates of return, there is very little likelihood of PPPs providing a share of the private funding for most projects.

If we look beyond this intimate link between the know-how of the experts and policy-makers' powers to take action we can see an even more formidable issue start to take shape, which is that, because the implementation and impacts of transport operations are long-term processes, the right questions to ask are those which concern the far distant future.

3. Do we know how to ask the right questions now about the future and how can we answer those questions?

We shall use an example to illustrate the difficulties involved in formulating the right questions and in drawing up strategies, through appropriate research programmes, to find answers to those questions.

Let us take the case of urban areas on major corridors where traffic levels are approaching saturation, which is one of the long-term problems that causes greatest concern. We know that because of urban sprawl, growth in daily car-based mobility can hardly be avoided. We also know that the long-distance traffic using these major corridors will continue to grow. Lastly, we know that development of local rail services is restricted by the need for train paths for freight and long-distance passengers. Consequently, there is a risk of major congestion that needs to be simulated accurately in order to assess this challenge realistically. Can this challenge be met simply by increased infrastructure capacity at specific locations or by adjusting road pricing? Should modal shifts towards rail transport be encouraged on the market segments concerned and provision made for the development of the rail infrastructure which this would entail? Should consideration also be given to reviewing the entire regulatory regime applicable to goods' deliveries in urban areas?

To be able to address these questions properly, we would need to be able to have mastered virtually all of the "squares" in Diagram 2, that is say to have thoroughly tested long-term simulation models available for each one. In addition, we would have to be able to use all these simulations coherently. This is made all the more difficult by the fact that each model is based on its own specific space and time frames. For example, freight simulation models use a regional breakdown to analyse annual traffic between major areas, whereas models of passenger traffic in an urban environment generally analyse peak hour traffic between districts within urban areas. If we wish to simulate, at time horizons of 15 or 20 years, the saturation levels relating to the use of the same infrastructure by traffic flows modelled on such disparate bases, then all of these models which were originally designed to answer questions will need to be supplemented and amended. It is apparent, therefore, that there are a

2. "Credit Implications of Traffic Risk in Start-Up Toll Facilities", Rating Direct, Standard & Poor's, 15 August, 2002.

number of obstacles to be overcome before combined simulations can be made for these two different types of flow systems (as well as for many others) on the same road and rail networks serving a given urban area.

Attempts have nonetheless been made to deal with this type of problem. They consisted in taking account of both passenger and freight traffic, local and long-distance traffic, and of course factors that are known to be determining in traffic emissions such as the location of residential areas and economic activities or in some cases economic growth. Examples include case studies of the Dutch province of Utrecht made with the MOBILEC³ model or the case study of the Lyons urban region based on the TELESCOPAGE model⁴.

In the latter case, the traffic forecasts made for 2015 are particularly worrying in the event of an average rate of economic growth in that peak-hour saturation of the road network would increase from around 15 kilometres of carriageway to several hundred kilometres on peripheral roads that at present are apparently far from their saturation point.

Admittedly the results obtained from the TELESCOPAGE model may be wrong. In practice, the model consists in the as yet relatively untested combination of several independent models and it may well inaccurately portray the effects of heavy congestion on mobility or modal split. However, the first attempts at long-term simulation of these telescoping effects would seem to indicate that there are serious risks of congestion and problems with which we are far less familiar than the conventional forms of congestion (on exclusively urban roads, major corridors or mountain crossings).

It can therefore be seen that an expert opinion, which cannot be definitive and which is no more than a presumption, can nonetheless identify major risks which, in order to be avoided, may perhaps require forceful political action. To manage this risk in a less uncertain context, decision-makers will need to know more than the experts are able to tell them. In short, political and scientific issues are locked into a continual process of mutual exchange and reinforcement.

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3. Van de Vooren, F.W.C.J. (1998), *A Policy Oriented Model about Economy, Mobility, Infrastructure and other Regional Features with an Application to the Dutch Province of Utrecht*, 8th WCTS Proceedings, Vol. 4, pp. 43-56. A presentation of MOBILEC applications was also given by Floris Van de Vooren at the "Networks for Mobility" international symposium hosted on 18 and 20 September 2002 by the University of Stuttgart: *Towards a Welfare Optimal Planning of Infrastructure*, pp. 146-156 of Volume 1 of the proceedings of the Symposium.
 4. Routhier, J.-L. *et al* (2000), TELESCOPAGE, *Modèle de simulation des trafics de marchandises et de personnes, locaux et interurbains, dans un espace de région-ville*, Final report, 171 p. This research project was directed by Jean-Louis Routhier from the LET, Pierre-Yves Hennebelle from the ISIS company and Eric Saliou from the CETE in Lyons.