

C 1.1 ROAD SYSTEM ECONOMICS

Recommendations to Decision makers

Try to address the issue of sustainability at each stage in the planning and operation of the transport system. For those projects which are subject to economic evaluation, the discount rate is a critical parameter, of which the value must be kept at a reasonably low level so as to take into account the interests of at least the next generation of population.

Do consider the specific qualities of each transport mode when designing a transport policy package:

- The performance in speed, access, traffic capacity; and,
- The social and environmental impacts.

The policy can be evaluated ex-ante by using a simulation model. The evaluation must be made with respect to a set of criteria that cover a wide range of aspects. The technical and economic approach to modelling and evaluation has a classical form, which was typified as a reference evaluation framework by TC 1.1.

Transport should be considered as a service for which the users have to pay. When developing a frame transport network, a local or national government has to consider subsidizing the infrastructure in order to achieve an adequate network structure and pace of development. Once a satisfactory frame network is established, the costs of its maintenance, completion and usage may be covered by the users, thus complying with the user pays principle.

Road pricing is the right instrument to charge the users with the costs induced by their traffic. This may be less appropriate in the context of building out the frame network, but once the frame network is established it is fair to tariff a trip with respect to its space and location, in accordance to its own impacts on the environment, safety and congestion. There is a wide range of rate-setting tools; some caution is required about the cost of the charging system, which must be low relative to the expected revenue. Caution should also been exerted about the toll rate, since very expensive rates on high-capacity facilities might lead to much traffic diversion on alternative facilities with lower level of equipment and service, at the risk of yielding more of undesirable impacts.

The implementation of a road pricing scheme may well raise an issue of acceptance by the car users and the population. Here some recommendations are in order:

- to design a transport policy package including not only the road pricing scheme, but also a set of actions such as improvement of travel alternatives by other routes, modes or time of day, improvement of the townscape and urban amenities, toll reduction for residents. To the trip-makers that keep using the car despite paying the toll, the main potential benefit lies in traffic reduction and speed increase.
- to involve the public and the various interest groups in both the design and implementation of the pricing scheme. Much information has to be delivered throughout the process. Monitoring is also required to identify people's requirements with the system operation and make adjustments to it.
- to facilitate the payment by providing several ways for that, including toll devices, phone-based and web-based.

To implement road pricing on a region or country network, a wise strategy is to begin with trucks, for three sets of reasons. First, truck traffic exerts relatively high impacts in terms of road wearing, congestion, noise and pollutant emissions. Second, as road freight transport is an economic sector of activity, an increase in cost will turn into an increase in price for its customers, thus creating a signal for them to make the right choices. Third, the issues of privacy and public acceptability are less crucial than for private car traffic.

Technical aspects

Concerning the methodology of project evaluation:

- The rational approach to project evaluation for aiding decision-makers makes a mature, consistent framework.
- This evaluation framework is well-suited to accommodate multimodal transport projects as well as considering social and environmental impacts.
- The evaluation can also be targeted at a specific actor or interest group involved in the transport system. Then it enables an analysis of the benefits and disbenefits as incurred by this actor in order to identify his/her position relative to a transport policy. The consideration of the various interest groups is key to understanding the issue of equity among users and non-users etc.
- The main features of multimodal transport must be taken into account in the traffic model that is used to simulate the supply-demand equilibrium. The supply-side features for multimodality include the intermodal facilities in terms of time and money cost and the elaboration of door-to-door transport chains as sequences of one or several modal legs. The demand-side features for multimodality pertain to the trip-makers' valuation of time expense, comfort and financial expense.
- The impacts of economic, social or environmental significance can be modelled on the basis of the outputs of the traffic model, notably the traffic flow and level-of-service by network link.
- Indicators of impacts can be evaluated in physical units. For many of them several methods of economic evaluation have also been developed in recent years. On reviewing various national evaluation frameworks, the committee found that for important impacts such as noise and greenhouse gas emission, the national values make out a wide range of values (from 1 to 10). A potential explanation, which needs to be studied further, is that each country has its own strategy to address that kind of impact (through avoidance, reduction or money compensation to those impacted) which would result in varied costs.
- The impacts on economic activity and land values are yet not fully understood. Recent research projects yielded significant findings that remain to be included into the classical evaluation toolbox.

Concerning road pricing in its objectives, instruments / tools and case studies:

- Various objectives of transport policy may be pursued by use of road pricing, from funding the network development to regulating traffic and demand.
- Conversely, several instruments including road pricing may have to be used jointly as a "transport policy package" in order to achieve a transport policy targeting the full range of impacts.
- Road pricing is one instrument for having the customer pay for the service, along with a set of taxes and charges. Each instrument has a given scope of relevance.

These have to be assessed in an integrated way prior to designing a wide-area road pricing scheme.

- There are many tools to implement road pricing, from vignettes and fixed tolls to link/lane pricing and area pricing, passing by distance-based tolls and parking fees. The choice of the tools must take into consideration the objectives (spatial scale, time and location of capacity scarcity or impact severance), the tool implementation and operating costs, and the interoperability of the pricing systems that apply to the same set of users (notably at the regional and national level, sometimes also at the international level).

Recommendations to PIARC

The PIARC Committee on Road System Economics has the following recommendation for future work to be undertaken within PIARC and also in cooperation with other international bodies:

- To perform ex-post evaluation of transport projects and policies, on the basis of case studies. In each case study, each kind of impact should be evaluated separately, first in qualitative or quantitative scale, then in monetary units on the basis of an explicit evaluation method.
- To assess the monetary evaluation methods associated to social and environmental impacts, in relation to the strategy for impact compensation.
- To consider the impacts of the transport system on the economic activity and performance on the basis of models from microeconomic theory as well as econometric studies. To develop related evaluation methods for inclusion in the evaluation toolbox.
- To address the particular issues of developing countries in a specific manner, by taking account of their specific needs, objectives, current state of development and solvency. Their need for transport demand should be assessed primarily on the basis of (1) the opportunity for them to achieve scale economies in the provision of basic public goods such as education, health and administration; (2) their comparative advantages for trade. Their need for transport supply should be assessed on the basis of both the demand objective and their ability to develop and maintain a given amount of equipment of a given modal technique.
- To take an economic approach to the very long-term issues of sustainability, which have been already addressed in a prospective manner. The existing systems for asset management present a risk of maintaining the current technology which might prove inefficient in the future. The transport system and mobility ways of the next generations have to be thought of on their own: an in-depth economic analysis would be useful, starting from scenarios for trip requirements and quota systems.