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HIGHWAY CONCESSIONS: AN EVALUATION METHODOLOGY

The Transport Unit has developed a project evaluation methodology whereby benefits may be broken down by target groups. To date, this approach has been used in three highway concession projects in Argentina, Chile and Colombia. It is also applicable to other projects where it is important to know how benefits are to be distributed as well as what the overall benefits will be.

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Introduction. Since the early 1990s, a number of Latin American countries have been increasingly opting to improve their road networks through concession schemes rather than direct action by the public works ministry. Argentina, Brazil, Chile and Mexico have enthusiastically adopted this approach. This trend has arisen partly from a desire to adapt transport systems to an increasingly competitive world without overburdening taxpayers, as high taxes may undermine governments' efforts to improve competitiveness. It also springs from the need to allocate tax revenues to social programmes such as education and health. Although this trend is firmly established, however, it has not reached massive proportions. Approximately 90 000 kilometres of railways have been sold or placed under concession to the private sector; concessions for highways, which require a heavier investment, total approximately 40 000 kilometres.

The need for evaluation. Highway concessions have not always resulted in positive experiences. The Mexican government, for example, has reassumed control of nearly half the concessions it had granted. In Argentina, toll increases were insufficient to avoid the need for subsidies, a significant

percentage of which have remained unpaid for extended periods of time. In Chile, tenders are sometimes cancelled for lack of valid bids. Because of their very nature, concessions pose a problem that is rarely acknowledged, i.e., there is a difference between the amounts collected for the use of highways and the actual cost of such use. In the case of automobiles, tolls are usually much higher than cost, whereas the opposite may be true for trucks with a higher weight per axle. Any discrepancy between the amounts charged and the marginal cost will lead to economic inefficiency.

A methodology for evaluating concessions. Standard socio-economic evaluations are conducted by calculating the overall benefit to the community at large, regardless of who the individual beneficiaries are, and comparing it to the costs involved. This is the approach followed in evaluation models such as the *Highway Design Model* and other models often used to determine the benefits of proposed highway projects. In the case of concession arrangements, governments usually estimate the profitability of the project, and the bidding companies make their own considerably more fine-tuned profitability estimates.

This approach does not produce detailed data on the benefits to be obtained by the users, on the one hand, and the community, represented by the government, on the other. Concession holders are often bound by the rules governing state corporations, and their shareholders or financial backers may also demand transparency in information sharing. In other cases, however, the information published provides no indication of the profit to be obtained by the concessionaire. In order to make it possible to determine the benefits to be obtained by each of the three groups of actors involved in a highway concession, the ECLAC Transport Unit has developed a simple methodology for evaluating the cost-benefit relationship in each case.

The methodology is, of course, fully consistent with the traditional approach, which appears to have been first used in the United States during the 1930s, when the Roosevelt administration passed the 1936 *Flood Control Act* as a means of lifting the country out of a deep recession through massive public works projects. The idea was to build works the benefits of which would outweigh the estimated costs, regardless of who the beneficiaries might be. For several reasons, however, it is sometimes important to determine who will benefit most from a project, and who will be most negatively affected by it.

Where roads are concerned, it may be appropriate to make no distinction between beneficiaries when the State does not collect tolls for their use. Even in such cases, however, it may be wise to determine how benefits are distributed, since a disproportionate share of them may be enjoyed by privileged sectors such as vehicle owners in a high income bracket or large landowners whose properties are well served by a new highway.

Given the current state of highway concessions, information should be obtained on the distribution of benefits, in order to:

- (i) improve the bidding process;
- (ii) optimize the fare structure and engineering specifications of each project;
- (iii) get an idea of the value of the concession, in order to establish a fixed annual charge or minimum price during the bidding process;

- (iv) request a contribution from beneficiaries to help cover the cost of the project;
- (v) provide compensation for damages; or
- (vi) distribute the costs of the project among its beneficiaries.

Objective (i) would go hand in hand with a *post facto* evaluation, while the others would entail a *pre facto* evaluation.

Distribution of benefits. In a conventional socio-economic evaluation, costs are estimated in terms of the use of resources. Taxes are not considered relevant, since, from a community standpoint, they simply represent a transfer of resources from one group in the community to another (although this approach would not be appropriate when different tax rates are applied for products the consumption of which would rise or fall if the project is carried out). When the evaluation is designed to break down the benefits of a project by beneficiary group, however, taxes cannot be left out of the calculations.

Highway improvements that reduce fuel consumption per vehicle-kilometre, for example, would benefit vehicle users by reducing their gasoline expenses. They would not know whether their savings are the result of lower payments to the finance ministry or to the oil company (and even if they did know, they probably would not care). Consequently, under the methodology proposed by ECLAC, the gas prices paid by consumers include taxes, but those taxes are accounted for twice – first as a cost to consumers and then as a benefit to the government. Similarly, tolls are accounted for twice – as a debit to users and as a credit to the concessionaire – even though toll payments are a transfer between the two parties and do not reflect a consumption of resources. See table 1. Transfers are shown in boldface type.

This methodology makes it possible to take into account a larger number of actors. It may be useful, for example, to find out if automobile users obtain greater benefits than truckers. As end users, automobile owners will keep almost all the savings resulting from a reduction in the cost of vehicle operation (including man-hours). Truckers, on the other hand, are providing a product that is part of an economic process; consequently, the savings in operating costs are transferred, through the mechanisms of market competition, to the consumers or producers of the goods they are hauling.

**TABLE 1: CLASSIFICATION OF BENEFITS BY TYPE OF ACTOR
IN THE HIGHWAY CONCESSION PROCESS**

USERS	CONCESSIONAIRE	GOVERNMENT
Travel time	-payment to the government (if applicable)	+payment to the government (if applicable)
Operating cost, including taxes	-investment, including taxes	-exploitation cost, not including project
accidents	-exploitation cost, including project,	-cost of management and regulation

including taxes

quality of service

-toll charge

-transaction cost to users

+ toll charge-transaction cost to the
concessionaire**+taxes**- transaction cost to the
government

Δ: positive or negative variation

Note: Transaction costs are exchanges between actors, e.g., toll payments that represent a cost in time for users and require outlays from the concessionaire for items such as labour.

To date, the methodology proposed has been applied in three highway projects. The first case involved the El Melón tunnel, located on Chile's main north-south highway, approximately 100 kilometres northwest of Santiago. The second was a network of roads that constitutes the northern access route to Buenos Aires. The third involved a network of roads located to the north of Bogotá.

Results in the Chilean tunnel project. In the case of the Chilean tunnel, where the tender deposit was the largest payment made to the Government, the users of the project and the government benefited. However, the concessionaire suffered losses because the deposit paid was not offset by the tolls collected. The concessionaire currently charges half the maximum allowable rate, and consequently is incurring substantial losses. The concessionaire had won the concession as a result of underestimating the cost of the investment, which was considered a transfer between the company and the users, to be paid to the Government. The project was beneficial from the standpoint of the community, as it produced a social rate of return of 16 per cent. It would have been more effective, however, if it had been carried out directly by the Government (provided it had the necessary resources) without charging tolls. Toll charges resulted in the tunnel being underused by a substantial number of potential users, especially truckers, who continue to use the old route over the mountain, which is more costly in terms of vehicle operation and the danger of accidents.

Results in the Argentine suburban freeway project. In the case of the northern access route to Buenos Aires, both the users and the concessionaire benefited from the project. The Government appears to have neither benefited nor suffered. The concession went to the lowest bidder, with no payment or subsidies being made by the State. The Government may have benefited indirectly, however, from the tax revenues generated by increased urbanization as the freeway provided easier access to the city. The project also produced a high social rate of return, i.e., 26 per cent. It fostered urbanization in the section of the metropolitan region where it is located, which in itself makes evaluation difficult. The concessionaire decided to set tolls at levels lower than the ceiling provided for under the contract. The evaluation was conducted in 2001, before the Argentine peso was devalued from a parity of one peso to the dollar to US\$ 0.30. By 2002, the gross domestic product (GDP) will have fallen by more than 10 per cent. Given the currency devaluation and the downturn in economic activity, the results of the evaluation would have been different had it been carried out one year later, especially if indebtedness in dollars were taken into account.

Results in the Colombian suburban road project. The basic characteristics of the Colombian project are similar to those of one carried out in Argentina, although it is considerably less ambitious in scope. The Colombian project benefited the users and the concessionaire, but not the Government. Under the terms of the concession, the State assumed responsibility for most of the overruns in investment costs, as well as for the costs arising from lower-than-expected volumes of

traffic on the completed roads. In this case, as in Chile, toll charges seem to have pushed some potential users, particularly truckers, to alternate routes that entail a greater social cost. The social rate of return of the project was only 8.4 per cent, and its current value is negative.

General conclusions. It is clearly impossible to reach general conclusions on the viability of road concessions from the study of three specific cases. There are some lessons to be learned, however, with regard to the design of highway concessions.

- (i) In Chile, although the concessionaire suffered losses, the project has not been a failure. It was beneficial to the users and to the Government, and the losses suffered by the concessionaire had no significant impact on the concessions system, since most of the concessions granted subsequently have been successful. Traffic has been lower and costs higher than anticipated. The concessionaire clearly erred by overestimating the volume of traffic (owing to an overly optimistic assessment of the country's economic prospects) or underestimating the cost of the project. In comparable cases in other countries, the Government has compensated the concessionaire, even when it was not required to do so. So far, this has not been done in the case with the El Melón tunnel project.
- (ii) In Colombia, the Government was in charge of preliminary designs for the project, and the concessionaire was responsible for the final blueprint. Costs arising from construction and expropriation were higher than those originally projected, and the Government had to cover most of the overruns, which amounted to over 30 per cent. The Government also had to compensate the concessionaire for most of the shortfalls in traffic volume. The project probably would not have been carried out if costs and traffic volume had been adequately forecast from the beginning. In more recent concessions, the Government has prepared the final blueprint.
- (iii) In each of the cases mentioned above, alternate routes were available and a significant percentage of truckers continued to use them. Truckers' route preferences should be taken into account in feasibility studies for concession projects.
- (iv) There is much that governments can do, through the tender process, to ensure that users benefit from concessions. Action in this regard can enhance a country's competitiveness, as well as its standard of living, and ensure that concessionaires obtain a return on their investment.

Other applications of the methodology. The proposed methodology is not only applicable to the evaluation of highway concessions. It is important to know, for example, how benefits are distributed in highway or railway concessions in transit countries, since a considerable share of the benefits may go to people or entities in neighbouring countries. The viability of a project may hinge on the contributions of such parties. A variation on this methodology has also been used to study the beneficiaries (passengers, cargo owners and operator) of a railway built in the mid-nineteenth century.
