Montreal Economic Institute
Ideas for a More Prosperous Nation

ECONOMIC NOTE

October 2007

Tolls as a solution for financing the road network

People often forget the fact that Quebec was once the province which made the greatest use of tolls.[1] Toll booths, which were abandoned in the 1980s, were installed on portions of highways 10, 13, 15 and 40, as well as on the Jacques-Cartier and Champlain bridges. As the road network faces deterioration and insufficient funding, the return of tolls is an interesting solution for several reasons.

This Economic Note was prepared by **Mathieu Laberge**, an economist at the Montreal Economic Institute and holder of a master's degree in international economics and econometrics from the University of Nottingham.

Most of the money spent on the road network comes from income sources that respect the user-pay principle. Fuel taxes and licence fees are imposed directly on road users. But not all forms of collection that follow the user-pay principle are equal. Those with a direct link between amounts paid and services used are preferable to lump sums guaranteeing unlimited access to a service. Thus, the most effective collection systems are tolls and fuel taxes since the amounts paid are set as proportions of actual road use. It would be preferable to emphasize this approach and to rely less on lump-sum forms of collection such as vehicle registration fees and driver's licence fees.

Tolls offer a more precise approach than fuel taxes since they can be adjusted to charge different amounts based on the time of day, thereby helping to alleviate traffic congestion. Tolls collected by private firms can also help finance highway repair projects without the use of government funds. Accordingly, the quality of highway infrastructure can be improved without raising government debt. Considering the vast scope of highway renewal and reconstruction work that can be expected in the coming years, tolls could be seen as a form of financing for all future work projects.

Financing models in which users pay

There exist a number of collection models for ensuring adequate financing of highway maintenance, in particular when using public-private partnerships. We will present three of them here (shadow tolls, availability or results-based payments, and traditional tolls) and explain why the last one is preferable.

Shadow tolls are a model under which the government pays an amount based on the number of vehicles using a highway to a private company in charge of operating it. Rates may vary depending on the level of use observed on the relevant stretch of road. But this form of financing runs counter to the user-pay principle since users provide no direct financing for the service they receive. They end up paying through general taxation but have no real way of knowing the specific value of the highways they use. This form of payment is especially well suited to low-traffic areas where historic use is well documented. When shadow tolls are used, private partners assume a lower risk since income fluctuates less than with traditional tolls.[2]

1. Fred Nix, *Alternative Road Financing Arrangements*, 2001, p. 8 (apart from the tolls on road links between Ontario and the United States).
2. Direction générale des routes [France], *Évaluation du recours au contrat de partenariat dans le domaine routier*, 2005, p. 81.

Table 1

Revenues and expenses related to the Quebec road network

REVENUES		($M)
User contributions		***2,536***
Fuel tax[I]	1,708	
Driver's licence fees and vehicle registration fees[I]	828	
Transfers from the federal government		***92***
TOTAL REVENUES		**2,628**
EXPENDITURES		
Spending related to the road network		***662***
Network operation[II]	275	
Administrative and labour costs related to network operation[II]	157	
Assistance to municipal networks[II]	126	
Amortization of work on the road network prior to the preservation and improvement fund[II]	105	
Dedicated contributions from the Quebec government		***97***
Contribution for the SAAQ takeover of roadside testing[IV]	57	
Contribution to the Société de financement des infrastructures locales[V]	40	
Road network preservation and improvement fund		***1,180***
Annual spending by the fund	605	
Amortization related to work conducted by the fund[V]	327	
Debt service of the fund[V]	247	
Cost of compensating for greenhouse gas emissions		**387**
TOTAL EXPENDITURES		**2,327**
Overpayment to the consolidated fund (revenues minus spending)		**301**
LESS: Dedicated contributions from the Quebec Department of Transport unrelated to the road network		**178**
Motorists' contribution to the public transit fund[V]	*68*	
Contribution to the Agence métropolitaine de transport [VI]	*100*	
Contribution to the financing of programs for handicapped persons (SAAQ)[IV]	*10*	
NET OVERPAYMENT		**124**

Sources: [I] Quebec Department of Finance, *Public Accounts 2005-2006*, Vol. 1 (to March 31, 2006); [II] Quebec Department of Transport, *Rapport annuel 2005-2006* (to March 31, 2006); [III] Quebec Department of Finance, *Public Accounts 2005-2006*, Vol. 2 (to March 31, 2006); [IV] SAAQ, *Rapport de gestion 2005* (to December 31, 2006); [V] Data from the Quebec Department of Transport; [VI] AMT, *Rapport annuel 2006*. See Appendices 1 and 2 for further details.

Availability or results-based payments are used as part of contractual agreements under which the government is committed to paying specific amounts to private partners based on road availability (measured according to the work completion timeline or the number of days of access) or based on fulfilment of quantifiable goals (minimum road quality, acceptable traffic congestion thresholds, etc.). The contracts at stake must undergo very careful examination to provide an adequate incentive structure for private partners in the form of penalties or bonuses. Private companies responsible for conducting work or managing infrastructure then assume no risk based on levels of use. In some instances, mixed financing formulas have been attempted. These include payments based partly on results and partly on traditional tolls.[3]

Traditional tolls involve direct payments by motorists to finance services they benefit from in their use of the road network. Payments can be made through an electronic system that records use on the stretches of road concerned and compiles results for direct billing of users, thereby eliminating tie-ups caused by stops at toll booths. Rates can be adjusted to take account of numerous factors, most notably traffic levels and distance travelled. This form of financing respects the user-pay principle and sends users clear and explicit signals regarding the value of services received.

Instituting tolls on Quebec highways could also be an effective tool against the tie-ups that occur on some urban expressways. By raising the cost of using these expressways at rush hours, tolls would encourage motorists who can travel at a quieter time of day to modify their habits.

Implementing tolls on Quebec highways must take account of two overriding factors. One is the avoidance of double payment for highway infrastructure. Payments from motorists in excess of the amounts paid by the Department of Transport for the road network after tolls are instituted should lead to a proportionate reduction in other sums collected. The government would thus have to shun the temptation of using tolls to generate revenues exceeding the value of services received by motorists.

Traditional tolls respect the user-pay principle and send users clear and explicit signals regarding the value of services received.

3. *Id.*, pp. 82-83.

The other factor to consider is the existence of alternate routes running in the same direction as toll roads. The existence of slower but free choices may jeopardize a portion of expected revenues due to a possible decline in toll road use. This raises the issue of a compromise between imposing tolls that are exclusive to certain roads at certain times or tolls on more extensive portions of the network. For practical reasons, it would be simpler to lean toward the gradual establishment of permanent tolls on main highways only, as their rehabilitation becomes necessary.

Clarifying the financing of roads

Road users' associations often say their members pay more than their share of road costs: "The cumulative effect of endless taxes and fees is that taxpayers — who, in many cases, are also motorists — are bearing an increasingly unfair burden in overall financing."[4] It is hard to determine, however, if the amounts collected from road users exceed the value of the services they receive since the portion paid to the Quebec government goes straight into the consolidated fund, the general "bank account" used by the government. It is then redistributed to the various departments, regardless of source.

It would be simpler to lean toward the gradual establishment of permanent tolls on main highways only, as their rehabilitation becomes necessary.

The following exercise is intended to compare government revenues from road users with the amount spent by Quebec Department of Transport on the road network. It draws upon the methodology used in the Ménard report on health and social spending with its "health care account" concept.[5] For the sake of transparency, this type of comparison must be made between revenues and spending involving various government programs. Creating a link between the financing of a highway and its use by motorists responds to the user-pay principle and facilitates long-term planning.[6]

Revenues related to the highway network come mainly from the provincial fuel tax as well as from licence and registration fees. In the 2005-2006 fiscal year, these two sources generated slightly more than $2.5 billion in income. To this amount should be added $92 million in federal transfers. Operating and administration expenses connected to the road network totalled $662 million, while contributions from the Department of Transport to various programs related to the road network came to about $97 million.

The cornerstone of spending on maintenance and expansion of the road network is the Road Network Preservation and Improvement Fund (*Fonds de conservation et d'amélioration du réseau routier*, or FCARR), which disbursed $1.3 billion in 2005-2006. During this period, 87% of the amounts spent by the fund produced long-term indebtedness. In Table 1, only $605 million of the fund's spending was recorded as annual expenditures.[7] The aim in setting up this model was to determine what portion of the fund's disbursements involved annual expenditures and what portion involved real investments. The hypotheses that were chosen are consistent with data from the years preceding establishment of the fund and the early years of its existence.[8] Added to this amount are amortization of work conducted by the fund ($327 million) and the fund's debt service ($247 million).

At present, only $70 million is recorded as expenditures for maintaining the network, under the "infrastructure maintenance" budget item. This amount is part of the "network operation" item in the table below. For purposes of comparison, the amount spent on infrastructure maintenance in 1996-1997, the first year the fund was operating, came to $361 million.[9] A reform of government accounting methods in 1996-1997 was conducted at the same time. Because it allows for a rise in government debt without affecting the budget deficit, in particular through the use of "special funds", it has added to the lack of transparency that runs rampant today. The opaque nature of rules for allocation of financing makes it hard to get a clear idea of the amounts spent annually to maintain the road network and to differentiate these amounts from infrastructure investment. Greater government transparency is essential in this regard.

Government data also fail to take account of a substantial cost connected to use of the road network, namely compensating for the greenhouse gas emissions produced by motor vehicles.

4. CAA-Quebec, *Open letter from CAA-Quebec regarding funding for public transit*, May 4, 2006.
5. Working committee on the sustainability of health and social care in Quebec, *Pour sortir de l'impasse : la solidarité entre nos générations*, 2005, p. 92.
6. Robin Lindsey, *Congestion Relief: Assessing the Case for Road Tolls in Canada*, C.D. Howe Institute, 2007, p. 11.
7. This amount is based on several hypotheses described in Appendix 1 (available on the website of the Montreal Economic Institute).
8. Quebec Department of Transport. *Rapport annuel 1996-1997*, 1997, p. 13 and *Rapport annuel 1997-1998*, 1998, p. 16.
9. Quebec Department of Transport, 1997, *op. cit.*, p. 13.

It is likely that part of the fuel tax is in fact a carbon tax with revenues applied to internalizing greenhouse gas emissions from motor vehicle use. The Canadian Tax Foundation supports this approach to taxation: "If it reduces the consumption of an item whose use generates harmful effects that are ultimately borne by members of society who may never have directly consumed this good, then it should be lauded."[10] This appears to apply to the portion of the fuel tax related to greenhouse gas emissions. The C.D. Howe Institute regards this as "(nearly) a perfect instrument for internalizing global warming costs caused by combustion of carbon-based fuels."[11] Accordingly, we have had to estimate these costs and include them in the table of road-related expenditures. This is the $387-million item that appears in the expenditures column of Table 1.[12]

The Road Network Fund, which allows for a rise in government debt without affecting the budget deficit, adds to the lack of transparency of public finance.

Taking account of all the hypotheses explained above, we arrive at an overpayment of $124 million in 2005-2006 in comparing motorists' contributions to government revenues with the amounts spent annually on the road network. This is a relatively small sum, coming to scarcely 5% of total spending on the road network.

These results must be interpreted prudently. A slight modification in these very cautious hypotheses would cause this result to vary greatly and would probably indicate that motorists do not pay enough. For example, the costs of compensating for road-related greenhouse gas emissions used in this model are nearly 30% lower than those used by Quebec's main supplier of compensation services, the Planétair service provided by the Unisfer International Centre.

Conclusion

Two conclusions stand out regarding the preceding analysis. First, there is room for greater transparency in the disclosure of data related to maintenance costs and the maintenance deficit of the Quebec road network. Current government practices do not allow for a clear and transparent picture of the situation in this respect. It would be worthwhile for the Auditor General of Quebec, or for some other body immune from political pressures, to look into this issue and clarify the rules and practices surrounding the management of Quebec highway infrastructure.

Second, the contribution from motorists to the financing of the road network should be part of an overall process to apply the user-pay principle so that they are aware of the precise value of the services they receive when using the road network. Most countries apply use-related financing in some form or other. Quebec would benefit from a return to tolls. In this regard, instituting tolls could be viewed as a way of financing all future rebuilding projects of the main highways

10. Robin W. Boadway and Harry M. Kitchen, *Canadian Tax Policy Third Edition*, Canadian Tax Foundation, 1999, p. 300.
11. Robin Lindsey, *op. cit.*, p. 7.
12. Details of the modelling technique used here are found in Appendix 2 (available on the website of the Montreal Economic Institute).

Montreal Economic Institute
Ideas for a More Prosperous Nation

Montreal Economic Institute
6708 Saint-Hubert Street
Montreal, Quebec
Canada H2S 2M6
Telephone (514) 273-0969
Fax (514) 273-2581
Web site www.iedm.org

The Montreal Economic Institute (MEI) is an independent, non-profit, non-partisan research and educational institute. It endeavours to promote an economic approach to the study of public policy issues.

The MEI is the product of a collaborative effort between entrepreneurs, academics and economists. The Institute does not accept any public funding.

One-year subscription to MEI publications: $125.00.

Chairman of the Board:
Hélène Desmarais

President:
Paul Daniel Muller

Vice President and Chief Economist:
Marcel Boyer

The opinions expressed in this study do not necessarily represent those of the Montreal Economic Institute or of the members of its board of directors.

The publication of this study in no way implies that the Montreal Economic Institute or the members of its board of directors are in favour of or oppose the passage of any bill.

Printed in Canada

Illustration:
Benoit Lafond

Graphic Design:
Valna inc.