

Urban Transportation Pricing Options

Overview

The application of more comprehensive pricing approaches to urban transportation would bring it closer to a typical “utility” model, strengthen the economic linkages between supply and demand, provide a powerful transportation demand management (TDM) tool, and provide more opportunities for equitable revenue generation by municipalities.

There has been much study and discussion of urban transportation pricing opportunities in Canada, but little movement to take advantage of them. Progress in pricing beyond the realms of transit and municipal parking has been limited by the presence of legislative, regulatory, technical and cultural barriers.

The four major avenues for urban transportation pricing options are vehicle use pricing, road pricing, parking pricing and transit pricing. The many tools that could be applied in each of these areas have clear benefits for urban quality of life, but vary in their feasibility, acceptability, cost, effectiveness, equity and side-effects.

Resources

- Transportation Association of Canada, *Financing Urban Transportation*, 1997 (available at www.tac-atc.ca)
- Transit Cooperative Research Program, *Traveler Response to Transportation System Changes*, selected chapters available at www.trb.org)
- R. Lindsey, “Road Pricing Issues and Experiences in the US and Canada,” 2003 (available at www.imprint-eu.org/public/Papers/IMPRINT4_lindsey-v2.pdf)

Related case studies in this series

- *GTA Fare Card: A Seamless Fare Collection System* (Greater Toronto, Ont.)
- *Universal Transit Passes in Canada: A Smart Move for Post-secondary Students* (Victoria, B.C., London, Ont. and Halifax, N.S.)
- *Free Transit on Smog Days: Clearing the Air* (Windsor, Ont.)
- *EcoPass: Employer-Sponsored Transit Passes* (Winnipeg, Man.)
- *Employee Transit Discount Program* (York Region, Ont.)
- *Car Sharing in Canada: Making More Sustainable Personal Travel Choices* (Vancouver, B.C. and Montreal, Que.)

Introduction

On the whole, urban transportation consumers only pay for a portion of the costs of the infrastructure and services they rely on. In this respect, urban transportation is unlike other utilities (e.g. electrical power or drinking water supplies) that collect user fees in order to meet actual system costs. Most transportation costs are paid for out of general municipal tax revenues, which may impact the ability to make urban transportation systems more sustainable.

For decades, economists and transportation professionals have struggled with the issue of transportation pricing. From a theoretical viewpoint, the insufficiency of direct transportation charges (noting the exceptions of public transit generally, and parking in some areas) means that urban transportation systems are condemned to economic inefficiency, because pricing acts as a link that keeps supply and demand in balance. From a more practical viewpoint, the lack of transportation user fees limits the ability of municipalities to generate the revenues they need to build, maintain and renew their transportation infrastructure.

These perspectives highlight the two main arguments for more comprehensive urban transportation pricing systems. First, pricing can be an effective form of **transportation demand management** (TDM), enabling decision-makers to more easily influence the mode, route and timing choices made by individual travellers. Second, pricing can be an effective and equitable means of **revenue generation** to pay for transportation system upkeep and expansion.

The most frequently considered opportunities for urban transportation pricing are vehicle use, road use, parking and public transit use. There are many different pricing tools that could be applied to these activities, and these tools are likely to have varying degrees of regulatory and technical feasibility, political acceptability, public cost, effectiveness, equity and side-effects. Their potential benefits, however, are significant enough to sustain ongoing study and debate. They include reductions in congestion, delay and pollution as well as increases in public health, safety, economic competitiveness and quality of life.

In 1997, the Transportation Association of Canada (a non-profit organization with members representing all levels of government and sectors of the transportation industry) published *Financing Urban Transportation* (available from www.tac-atc.ca), an influential briefing that highlighted the threat posed by conventional financing models to the vision of sustainable urban transportation. Among other things, the briefing called for an emphasis on “user pay” approaches that would treat transportation as “a government-controlled utility where the user is charged based on consumption.” It noted that transportation user fees could improve system efficiency, equity, user choice and community sustainability.

In recent years the challenges of economic and environmental sustainability have become more pronounced, and the call for more transportation pricing in Canadian urban areas has been heard many times from many different quarters. Urban transportation pricing actions have been studied and recommended in municipal planning processes in many different cities. It is not clear whether virtual absence of concrete results is a reflection of poor awareness of the issues, a reluctance to confront mixed public opinions, institutional barriers, or other factors. But the declining sustainability and mounting infrastructure deficit of Canadian cities provide a compelling context for a renewed examination of what urban transportation pricing can accomplish, and how.

This paper summarizes the major types of urban transportation pricing — the forms they could take, notable international and domestic experiences, potential effectiveness and other issues.

Vehicle use pricing options

These measures represent charges to motor vehicle users based on their vehicle ownership and/or overall use. It is worth noting that Canadian municipalities have little ability to undertake these measures — vehicle registration is a provincial responsibility, insurance premiums are a provincial and private-sector issue, fuel taxes are collected by the provincial and federal governments, and car sharing is largely the bastion of private-sector and non-profit organizations.

Flat fees for vehicle registration can generate meaningful revenues, but unless they are increased drastically would have a negligible impact on levels of auto ownership or use. One Canadian example of this kind of measure is a \$30 levy on every vehicle registered annually in the Montreal area, which goes to the Agence métropolitaine de transport in support of regional transit services.

Variable fees for vehicle registration that are based on annual distance driven have greater potential to influence vehicle use, but only if they are substantial — say, an average of several hundred dollars a year (i.e. a major and likely unpopular increase).

Distance-based vehicle insurance premiums have greater potential to affect demand, and may be more acceptable to consumers because they are a variation on an existing fee rather than a new fee. The insurance industry has generally opposed the concept. However, since 2002 insurers in Texas have been able to sell vehicle insurance on a “pay-as-you-go” basis (i.e. per mile). Because insurance premiums are significant, pro-rating them by distance driven can offer a real incentive to drive less. However, municipalities have no tangible interest or influence in vehicle insurance, and generate no revenues from it.

Urban transportation pricing options

<p>Vehicle use pricing options</p> <ul style="list-style-type: none"> ▪ Flat vehicle registration fees ▪ Variable vehicle registration fees ▪ Distance-based vehicle insurance premiums ▪ Fuel taxes ▪ Car sharing 	<p>Transit pricing options</p> <ul style="list-style-type: none"> ▪ Changes in overall fare levels ▪ Time-based fare strategies ▪ Distance-based fare strategies ▪ Mass market promotions ▪ Workplace discounts and sales by payroll deduction ▪ Universal transit passes (U-Passes) ▪ Multiple-fare discounts ▪ Elimination of fares ▪ Fare category changes ▪ Transfer policies ▪ Fare integration strategies
<p>Road pricing options</p> <ul style="list-style-type: none"> ▪ Area-wide pricing ▪ Facility or corridor pricing ▪ Lane pricing 	
<p>Parking pricing options</p> <ul style="list-style-type: none"> ▪ General parking fees ▪ Parking stall taxes ▪ Parking rate differentials ▪ Elimination or reduction of workplace parking subsidies 	

Fuel taxes can generate substantial revenue, but their potential effects on demand may be constrained by their limited transparency (i.e. drivers are not likely to readily perceive the cost, which is hidden in the overall price of fuel, or to view it as a direct function of transportation system use). Recent history has also shown that changes in fuel prices do not seem to lead to significant behaviour changes in the short term, although longer-term increases should have some influence.

Car sharing is a system of short-term car rentals enabled through individual membership in a club or cooperative. Car sharing organizations are active in several Canadian cities (see the case study # 32 *Car Sharing in Canada: Making More Sustainable Personal Travel Choices*), and let users distribute the fixed costs of vehicle ownership, registration and insurance on a per-kilometre and/or per-hour basis. Some Canadian municipalities provide assistance to car sharing operations, but do not take responsibility for them.

Road pricing options

These measures represent charges to motor vehicle users based on their use of specific roads or roads within a given area. “Simple” road pricing (e.g. flat-rate or distance-based tolls often used to pay for a facility after construction) is limited in its ability to help manage demand, whereas “value” road pricing (e.g. tolls or charges that vary by time of day, type of user or level of demand) is more flexible and effective in shaping traveller behaviour.

In general, Canadian municipalities do not have the authority to apply road pricing measures. The Greater Vancouver Transportation Authority is perhaps unique in its provincially granted power to impose project tolls, an authority that still falls well short of more sophisticated approaches to road pricing. Other challenges faced by road pricing schemes can include substantial infrastructure and operating costs, privacy concerns, and public resistance to paying for the use of previously free facilities.

Area-wide pricing such as cordon fees or area permit fees require payment by drivers wishing to enter or travel within a defined area. By varying charges according to day of week and time of day, such schemes can shift demand out of peak periods or onto public transit. A recent example is London, England’s congestion charge, a £5 daily fee for most vehicles travelling in the central city between 7:00 a.m. and 6:30 p.m. on weekdays (central city residents receive a 90% discount, and exemptions are granted to taxis, some service vehicles and cars carrying persons with disabilities). Other international examples include Singapore’s Area License Scheme and “toll rings” in the Norwegian cities of Oslo, Bergen and Trondheim. A more sophisticated (and still conceptual) form of area-wide pricing would involve charging drivers based on actual distance or time spent driving within the area, as well as on prevailing conditions during each trip (e.g. per-kilometre

charges could vary continuously with the level of congestion experienced).

Facility or corridor pricing can apply to one or more highways, bridges or tunnels. Fees that vary by time of day or day of week can be used to manage demand, although effects may be limited when free alternatives are readily available. There are many international examples, but the best-known Canadian example is Highway 407 in the Greater Toronto Area. When it opened, this fully automated electronic toll road (ETR) had highly variable rates (passenger vehicles were charged \$0.10 per kilometre during weekday peak periods, but only \$0.04 per kilometre at night). However, rates were made much less variable in 2002 and now sit between \$0.14 and \$0.15 per kilometre, depending on the time of travel.

Lane pricing applies to one or more highway lane that offers a better level of service than the adjacent free lanes. One example is a high-occupancy toll (HOT) lane project on I-15 in San Diego, California that lets single-occupant vehicle drivers pay to use high-occupancy vehicle lanes. Another example is an “express lane” tollway in the median of State Route 91 in Orange County, California that offers paying drivers a faster alternative. While these examples are interesting from the perspectives of transportation system efficiency and cost-recovery, their benefits for demand management are debatable.



High-occupancy toll lane (with diamond markings, left) on I-15 in San Diego, CA (Source: U.S. Federal Highway Administration)

Parking pricing options

These measures represent financial tools affecting the provision or use of motor vehicle parking spaces. Parking-related fees may vary across a wide range of geographic areas, land uses and parking facility types. It should be noted that Canadian municipalities generally have limited authority to influence the price of parking, with powers that extend only to on-street and off-street public parking facilities under municipal ownership.

General parking fees for an overall area may be imposed by regulation, or may arise from a cost-recovery or profit motive. They may apply to either on-street or off-street parking. Such out-of-pocket parking costs, where they are borne by consumers, are one of the most powerful tools available to TDM strategists because many car trips otherwise incur no out-of-pocket costs for travellers.

Parking stall taxes are assessed to the owner of a parking space, and may or may not be passed on to the user(s) of that space. In a circumstance that is unique among Canadian municipalities (and therefore not replicable without significant changes to provincial legislation), the Greater Vancouver Transportation Authority (TransLink) is empowered by provincial legislation to apply a tax on parking stalls. The agency's most recent plan (2005) calls for the use of this tax to raise about \$25 million per year. Where such a tax is not transparent to the eventual consumer (e.g. where parking is free), the immediate demand management benefits may be negligible — however, longer-term reductions in parking supply at new developments could result. It should be noted that TransLink also imposes a sales tax on paid parking, but the purpose is revenue generation rather than demand management.

Parking rate differentials can favour target markets like short-term users (e.g. by discounting short-term rates rather than all-day rates) or high-occupancy vehicles (e.g. by offering discounts to carpools). They can also free up on-street parking capacity in commercial areas by discounting off-street public parking rates. Such measures can help to balance parking supply and demand, and can even influence modal choice (e.g. for commuters).

Elimination or reduction of workplace parking subsidies are equivalent to a parking fee for commuters, and can be powerful TDM tools. A variation called “parking cash out” describes the situation where employees can give up their parking space in exchange for financial incentives to take transit or other preferred modes. This approach is used by employers in the United States, where federal taxation enables employees to “cash out” their parking space without being taxed on the financial benefit.

Transit pricing options

This paper reviews transit pricing measures that can increase or otherwise help to manage transit demands, rather than those intended to simply increase revenues or recover the cost of service changes. All of the measures described below lie within the authority of Canadian municipalities and their transit systems.

Changes in overall fare levels such as an across-the-board reduction are used to retain and attract riders. Because transit demand is generally considered to be inelastic, overall fare reductions can be expected to increase demand but not sufficiently to avoid a loss of total revenue.

Time-based fare strategies such as evening or weekend fare reductions are used to increase demand in off-peak periods when transit capacity is typically available, possibly by shifting demand out of overloaded peak periods. Off-peak period transit users may include a relatively high proportion of seniors, students and other economically disadvantaged groups, and are considered to be more sensitive to fare changes than peak period users.

Distance-based fare strategies adjust the basis on which fares are calculated. Examples include “flat rate” fares, and fares calculated based on the number zones crossed or total trip distance. Flat rate fares favour riders who make long trips by charging them the same amount as riders who travel only a short distance.

Mass market promotions that offer special fares in conjunction with targeted marketing strategies can encourage new users to give transit a try. For example, in 2003 Transit Windsor (Windsor, Ont.) eliminated fares on four “smog days,” a strategy that increased daily ridership by up to 50% (see the case study *Free Transit on Smog Days: Clearing the Air*).

Workplace discounts and sales by payroll deduction make transit more attractive to commuters by increasing the affordability and/or convenience of a transit pass. Several Canadian transit systems sell discounted transit passes or tickets at workplaces (see the case studies *EcoPass: Employer-Sponsored Transit Passes* and *Employee Transit Discount Program*). These programs attract relatively small volumes of new riders, but help to retain existing transit users and also encourage former cash or ticket users to start using passes instead — a change that may prompt them to take transit more often for non-commuting purposes.

Universal transit passes (U-Passes) make transit more convenient and economical for an entire market segment. In Canada, U-Passes are available at over 20 colleges and universities (see the case study *Universal Transit Passes in Canada: A Smart Move for Post-secondary Students*), where members of the student body (or a subgroup like full-time undergraduate students) pay a fee giving them unlimited

access to transit for the entire semester or academic year. The U-Pass fee is determined in a way that makes it revenue-neutral for the transit system, but lower than the cost of buying regular passes or tickets. In many instances, U-Pass programs have led to campus ridership increases of 50% to more than 100% within a single year. Boulder, Colorado, offers an Eco Pass program based on similar principles to both employers and neighbourhood groups.

Multiple-fare discounts encourage riders to buy several tickets or tokens at once, reducing their per-trip costs and encouraging them to take transit more often. Minimizing the use of cash fares also helps reduce the transit system's fare handling costs.

Elimination of fares can be applied in different ways, such as within certain areas like downtown cores (e.g. the fare-free zone established by Calgary Transit on its light rail transit line), at specific times (e.g. off-peak periods), or for specific services (e.g. destination-specific shuttles).

Fare category changes adjust the treatment of different classes of riders, such as common discount fares for students or seniors.

Transfer policies can make transit more attractive for certain trips. For example, making transfers valid for a certain time window regardless of travel direction can enable some users to make short return trips for a single fare. It also makes it easier for transit operators to monitor the usage of valid transfers.

Fare integration strategies encourage riders to use multiple transit systems for a single trip. Examples include the establishment of free or low-cost transfers between transit systems, or the development of electronic fare media that let regional residents to use different transit systems without needing to carry a variety of tickets or passes (see the case study *GTA Fare Card: A Seamless Fare Collection System*).

Conclusion

Urban transportation pricing can be a powerful tool to help Canadian communities move towards economic, environmental and social sustainability. However, progress toward comprehensive and effective application of pricing tools (beyond the realms of transit and municipal parking) is challenged by significant legislative, regulatory, technical and cultural barriers.

Some vehicle use pricing options, such as vehicle registration fees or fuel taxes, are useful from a revenue generation perspective but do little to affect travel demand. Others, such as distance-based insurance premiums, generate no revenues to support the transportation system but can affect the total vehicle-kilometres that drivers travel. In general, however, vehicle use pricing options provide no firm link between user fees and the economic

costs of individuals' travel choices (i.e. based on trip time, facilities used or congestion encountered).

Road pricing options, used effectively, provide an opportunity to directly manage transportation demands, and a variety of successful examples exist from around the world. Simple road pricing approaches (e.g. tolls that do not change with road congestion levels) have more limited potential than value pricing approaches, which are increasing in sophistication and feasibility due to technological developments. However, only in very rare instances are Canadian municipalities empowered by provincial governments to apply road pricing tools.

The price of parking at a destination can substantially influence the mode choice of travellers, but is generally a function of market supply and demand. The parking pricing options available to municipalities are relatively limited in scope and effectiveness, with rare exceptions.

Transit pricing options are numerous and varied, reflecting the solid public acceptance of transit user fees (i.e. fares) and the readily available means of collecting them. The main limitation of transit pricing strategies is that, while they can help attract new transit users and retain existing ones, they have no effect on the great majority of passenger travel that is still served by automobiles.