

Detailed Case Studies of Selected Revenue Tools

Project Number:

60236189

Date:

September 2012

Detailed Case Studies of Selected Revenue Tools

Final Report

September 2012

Prepared for:
Metrolinx
20 Bay Street, Suite 600
Toronto ON M5J 2N8

Prepared by:
AECOM Canada Limited
105 Commerce Valley Drive West
Markham ON L3T 7W3

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("Consultant") for the benefit of the client ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by Consultant represent Consultant's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since Consultant has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, Consultant, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by Consultant and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report"), except to the extent those parties have obtained the prior written consent of Consultant to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

Table of Contents

Statement of Qualifications and Limitations

	page
1. Introduction.....	1
2. Central London Congestion Charging Scheme (London, UK).....	3
3. Central Stockholm Congestion Charge (Swedish Transport Agency).....	11
4. Commercial Concentration Tax (Toronto).....	18
5. Congestion Levy (Melbourne City Council, Australia).....	20
6. Employer Payroll Tax Dedicated to Public Transit (Versement de Transport, France).....	27
7. Greater Manchester Congestion Charge.....	32
8. Heavy Goods Vehicle Tolling (Germany).....	36
9. High Occupancy Toll Lanes (Metropolitan Transit Authority of Harris County (METRO), Houston, Texas).....	43
10. Overview of State and Local Sales Taxes for Dedicated Infrastructure Funding.....	49
11. Overview of Other Sales and Excise Taxes Dedicated to Transportation Funding (Canada, US).....	57
12. Overview of Tax Increment Financing (TIF) (US).....	65
13. Road Space Rationing (Sao Paulo, Brazil).....	73
14. Transit Fare Restructuring and Distance-Based Fares (Singapore).....	77
15. TransLink Motor Fuel Tax (Metro Vancouver, BC).....	82
16. TransLink Parking Sales Tax (Metro Vancouver, BC).....	90

List of Figures

Figure 1: Central London Congestion Charging Zone.....	3
Figure 2: Profitability of all Businesses, pre and post charging.....	6
Figure 3: Business Sales and Profitability, pre and post charging.....	6
Figure 4: Net Annual Change in VAT Registrations and De-Registration, pre and post charging.....	7
Figure 5: Congestion Charge Method of Payment (January 2004 to December 2007).....	8
Figure 6: Central Stockholm Congestion Charge Area.....	12
Figure 7: Technical System Schematic of Central Stockholm Congestion Charge.....	13
Figure 8: Average Traffic reduction during the Congestion Tax Trial (January – July 2006).....	14
Figure 9: Melbourne Congestion Levy Area.....	21
Figure 10: Proportion of Total Revenue from Each Levy Payer (2006).....	22

Figure 11: Funding public transport in Ile-de-France (2009).....	28
Figure 12: Transport Tax and Public Transport Cost in Ile-de-France (current, € billion).....	29
Figure 13: Transport Tax Dependent on Economic Activity.....	29
Figure 14: Greater Manchester Congestion Charge Area.....	33
Figure 15: Truck Toll Collection – Automatic log-on	38
Figure 16: Truck Toll Collection – Manual booking (on the internet or at toll station terminal)	38
Figure 17: Kilometres driven by toll-liable trucks in the emission categories S1 – S5.....	40
Figure 18: Houston Metro Proposed Hot Lane Network	44
Figure 19: How HOT Lanes Work	45
Figure 20: Average Travel Speeds and Travel Times for FY 2010.....	46
Figure 21: Measure R Expenditure Plan Allocation	52
Figure 22: Measure R Proposed Rail and Rapid Transit Expansion and Proposed Highway Improvements	54
Figure 23: Beltline Tax Allocation District, Atlanta, Georgia.....	69
Figure 24: Expanded Center, Sao Paulo.....	74
Figure 25: Before and After Distance Fares.....	77
Figure 26: Proposed Funding Formula.....	82
Figure 27: Metro Vancouver	83
Figure 28: Breakdown of Revenue Contributions by Major Source (%)	85
Figure 29: Proposed Evergreen Line	87

List of Tables

Table 1: Central London Congestion Charge Payment Methods and Associated Features	4
Table 2: Central London Congestion Charge, Summary of Revenues and Costs	5
Table 3: Central Stockholm Congestion Charge Revenue and Operating Cost.....	14
Table 4: Results of the Referendum	34
Table 5: Toll rates per kilometre from 1 January 2009	37
Table 6: MVST Phase-in Allocation	58
Table 7: MVST Phase-in Additional Revenues.....	58
Table 8: Revenues Generated by Hotel Occupancy Tax.....	61
Table 9: Licence Plate Restrictions by Weekday	73
Table 10: Distance Fares – Types of Tickets Prices.....	79
Table 11: Motor Fuel Tax Rates and Revenues	83
Table 12: TransLink Tax Revenues 2008-2011	90
Table 13: Parking Sales Tax Revenues.....	91
Table 14: Average Monthly Downtown Parking Rates in Vancouver	92

1. Introduction

This document presents the results of 15 case studies on selected revenue tools designed to inform the evaluation of preferred revenue tools under the Metrolinx Investment Strategy. The main purpose of these case studies is to provide a better understanding of the range of jurisdiction-specific experiences where revenue tools have been implemented to fund transportation projects and/or improve mobility outcomes for passengers and the fluidity of goods movement in urban areas. Specifically, the results of the case studies were intended to inform the preparation of individual revenue tool profiles, including the quantification of travel behaviour and efficiency impacts, for potential implementation in the GTHA region.

The case studies presented in this report were selected jointly with Metrolinx in order to improve our understanding of several facets of revenue tools, including the policy context, how these work in practice, and their economic, social and business impacts. The selection focused on alternative revenue tools which have potentially significant impacts on travel behaviour and those of greatest potential interest for the GTHA region. We selected specific revenue tool implementation experiences which may not yet be well understood within the region – either because these cases are further afield (e.g. major European schemes or even US schemes which have generated primarily local interest) or because they have occurred long ago (e.g. the Toronto Commercial Concentration Tax in 1990). The case studies sought to cover both successes and failures, as measured by the longevity of the tool as well as an evaluation of the impacts as compared to original policy objectives. In addition, the case studies included two surveys of traditional tax-based revenue tools which have no behavioural impacts (one on sales taxes and the other on excise taxes covering specific goods or services, such as car rental fees). These were structured as surveys, because there were a multitude of case examples to choose from and the best research tool consisted of an issue-focused literature review. The case studies selected are as follows:

1. Central London Congestion Charging Scheme (London, UK)
2. Central Stockholm Congestion Charge (Swedish Transportation Agency)
3. Commercial Concentration Tax (Toronto)
4. Congestion Levy (Melbourne City Council, Australia)
5. Employer Payroll Tax Dedicated to Public Transit (Versement de Transport, France)
6. Greater Manchester Congestion Charge
7. Heavy Goods Vehicle Tolling (Germany)
8. High Occupancy Toll Lanes (Houston, Texas)
9. Overview of Local Sales Taxes Dedicated to Infrastructure Funding
10. Overview of Other Sales and Excise Taxes Dedicated to Transportation Funding (Canada, US)
11. Overview of Tax Increment Financing
12. Road Space Rationing (Sao Paulo, Brazil)
13. Transit Fare Restructuring and Distance-Based Fares (Singapore)
14. TransLink Motor Fuel Tax (Metro Vancouver, BC)
15. TransLink Parking Sales Tax (Metro Vancouver, BC)

A case study framework was developed to address the issues which would best inform the evaluation of the revenue tools in question as potentially applied to the GTHA and related policy decision-making. The framework consisted of the seven evaluation categories described below. Research was conducted based on publicly available data, news articles and studies.

1. Introduction
 - policy context and objectives
2. Revenue potential
 - revenue impacts, including overall revenue yield, variability of revenue over the business cycle and long-term sustainability of revenue stream
 - revenue tool design features, including geographic coverage, pricing features and changes in these features over time
3. Behavioural impacts
 - impacts on travel behaviour – including effects on network congestion, mode shifts, time savings and related costs (e.g. fuel savings, other auto usage costs), safety and environmental impacts
 - other impacts, including impacts on local businesses, the location or spatial distribution of economic activity, and impacts on land use
4. Implementation and administration
 - covers the following issues: (i) ease and speed of implementation, including implementation risks, (ii) incremental capital costs of implementation, (iii) collection and enforcement technology choices and issues, (iv) collection and enforcement costs (i.e. incremental operating and maintenance costs), and (v) the relevant collection agency (national, provincial, municipal, regional or other entity)
5. Governance
 - covers the following issues: (i) lead jurisdiction and other jurisdictions involved in decision-making, (ii) how the tool was introduced (e.g. on a stand-alone basis or as part of a larger package of measures; as a pilot project), (iii) level of public engagement prior to tool adoption (if applicable), and (iv) how funds were spent, where relevant (e.g. dedicated to selected transportation projects)
6. Equity and Distributional implications
 - covers equity and distributional impacts across income, socio-demographic groups and geographic areas, including any complementary measures which accompanied the implementation of the revenue tool
7. Overall economic efficiency
 - efficiency impacts take into account changes in travel behaviour (mode shifts, decongestion benefits, vehicle usage costs, collision and environmental externalities), incremental capital and operating costs, as well as any inefficiency costs associated tax-based tools (e.g. distortions to labour supply, work effort and consumption patterns)

2. Central London Congestion Charging Scheme (London, UK)

Introduction

The Congestion Charge scheme in Central London was introduced in 2003 as a response to a specific proposal in the Mayor’s Transport Strategy, to tackle congestion. The original congestion charging zone was extended westwards in 2007, to cover West London. However, following a change in Mayor in 2008, the western extension was reviewed and removed in 2011, converting back to the original charging zone.

Primary Objective

- Reduce Congestion

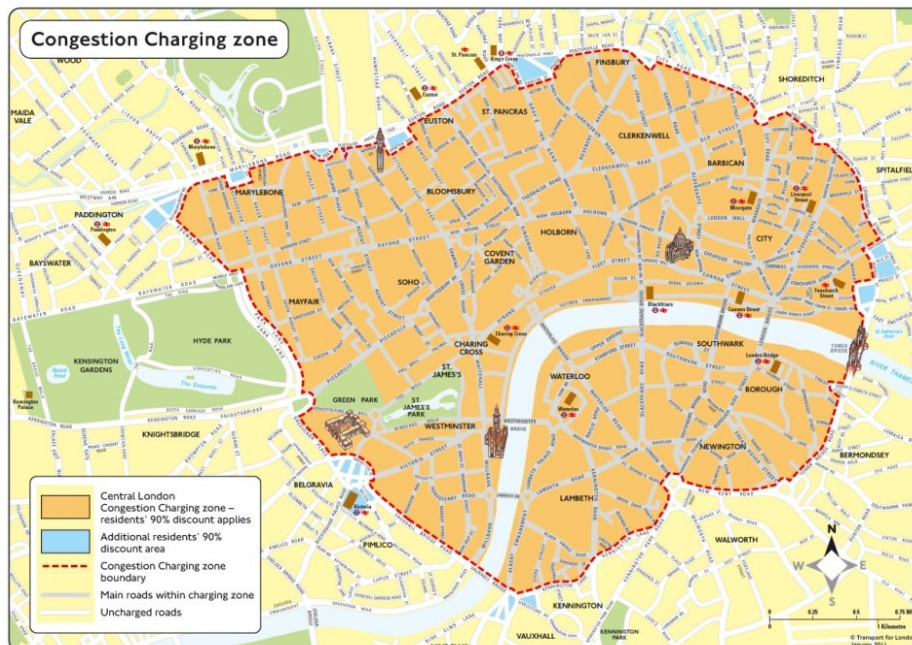
Secondary Objectives

- Improvements to public transport services
- Improve journey time reliability
- Efficient and effective distribution of goods and services
- Facilitate wider transport, safety and environmental improvements, such as better air quality
- Produce net revenues to support the Mayor’s Transport Strategy

Revenue Potential

More than 650 Automatic Number Plate Recognition (ANPR) cameras at entrances / exits around the charging zone capture vehicle number plates and check them against a database to work out if payment has been made, is exempt or has a 100% discount. The database is checked until midnight the next charging day and if payment is outstanding a Penalty Charge Notice (PCN) is issued to the vehicle owner. The PCN enforcement process is defined by law and follows a specific legal process to ensure payment is received.

Figure 1: Central London Congestion Charging Zone



Source: Transport for London (TfL)

<http://www.tfl.gov.uk/tfl/roadusers/congestioncharge/whereandwhen/assets/DetailMapECCZ.pdf>

Hours of Operation

- 07:00 – 18:00, Monday to Friday
- No charge on weekends, public holidays or between 25th December and 1st January inclusive

Only one payment is required per vehicle per day, no matter how many times the vehicle drives in and out of the charging zone on the same day. Payment can be done in advance or on the day of travel by different means:

- By Congestion Charging Auto Pay – £9 (C\$ 14.6)
- Before the day or by midnight on the day of travel – £10 (C\$ 16.2)
- By midnight on the following charging day – £12 (C\$ 19.4)

Table 1: Central London Congestion Charge Payment Methods and Associated Features

Method of Payment	In advance of the day of travel (£10)	On the day of travel by midnight (£10)	Next charging day by midnight (£12)
CC Auto Pay	Billed directly based on travel per month – requires pre-registration (£9)		
Online	✓	✓	✓
By Text Message	X	✓	X
By Phone	✓	✓	✓
At a Shop	✓	✓	X
By Post	✓	X	X

Source: Transport for London (TfL)

Exempt vehicles

- Two-wheeled motorbikes (and sidecars)
- London licensed minicabs and taxis
- Emergency
- Buses

Other exemptions (if registered)

- Electric and Greener vehicles (that emit less than 100g/km of CO₂ and meet Euro 5 standard)
- Accredited breakdown assistance vehicles
- Vehicles with nine or more seats
- Blue badge holders (a disability parking scheme)
- Residents in or next to the charging zone (90% discount)
- Businesses or other organisations with a fleet of 10 or more vehicles (30% discount)

The scheme design has undergone numerous changes since implementation in February 2003:

1. Increases in the congestion charge

The daily charge has been reviewed on several occasions during the operation of the scheme and is currently double the initial charge when the scheme opened, although a £1/day discount is available for drivers who register with CC Auto Pay (an automated payment system which records the number of charging days a vehicle travels within the charging zone and charges the driver's credit or debit card each month).

2. Change in the operating hours

Since February 2007, the operating hours of the charging zone have been 07:00 to 18:00. This is a change by 30 minutes from the original operation which ran until 18:30. The effect of this was evident, with a clear shift in traffic entering the zone during the 18:00 to 18:30 period, following a flatter profile than previously, with no distinct additional peak reflecting drivers waiting outside the zone for the end of the charging hours.

3. Changes to the charging zone

In February 2007, after extensive consultations the charging zone was doubled in size, with an extension westwards. The impact of extending the charging zone was monitored with consultations held. There was an unfavourable opinion from both individuals and businesses on the extension and the decision was made to revert back to the original charging zone, which happened in January 2011.

Revenue Impacts

Table 2: Central London Congestion Charge, Summary of Revenues and Costs

Revenues and Costs – £ million (C\$ million)	2004/05	2005/06	2006/07	2007/08
Operating Cost	92 (149)	88 (143)	90 (146)	131 (212)
Gross Revenue	190 (308)	210 (340)	213 (345)	268 (434)
Net Revenue	97 (157)	122 (198)	123 (199)	137 (222)
Operating Cost as a % of Revenues	48%	42%	42%	49%
By law, all net revenue raised by the charge has to be invested in improving transport in London.				
Allocation of Revenues (percentage)	2004/05	2005/06	2006/07	2007/08
Bus Improvements	80	82	82	82
Road Infrastructure	11	11	11	10
Road Safety	2	3	4	3
Other	7	3	2	6

Sources: Transport for London (TfL): Congestion Charging: Third Annual Monitoring Report; TfL, Congestion Charging: Fourth Annual Monitoring Report, TfL; Congestion Charging: Fifth Annual Monitoring Report, TfL; Congestion Charging: Sixth Annual Monitoring Report, TfL

Behavioural Impacts

Reduction in traffic levels

- Annualised results for 2007 show a 16% reduction in total vehicles entering the charging zone during charging hours (compared to 2002 levels)
- In the same year, a 29% reduction in potentially chargeable vehicles was recorded during charging hours (compared to 2002 annualised levels)
- Since 2003, small year on year reductions in traffic have been sustained (reflecting the general trend in underlying traffic volumes declining)

Congestion Relief

- During the initial years of the scheme, the absolute level of congestion, measured as delay minutes relative to free flow conditions, was reduced by between 20% and 30%, compared to before implementation
- The substantially higher congestion in the central zone in 2006-07, as compared with conditions observed during the early years of the scheme (2003, 2004), was due to a reduction in effective road network capacity due to ongoing utilities maintenance works and associated traffic management measures like lane closures)

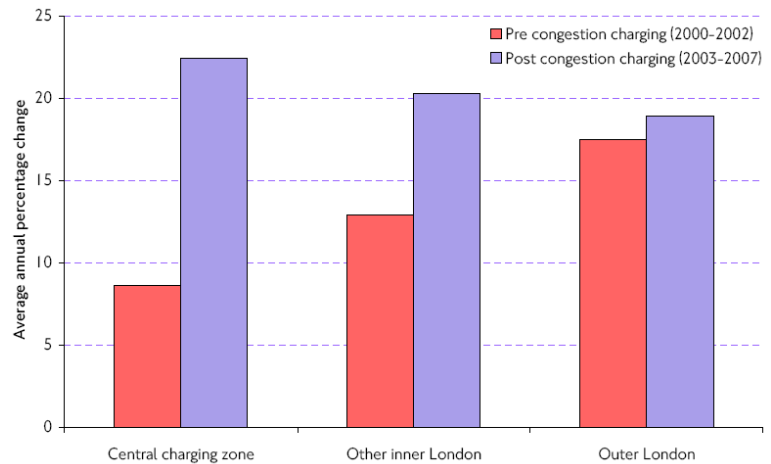
Increase in public transport capacity and patronage

- The Congestion Charge was accompanied by a substantial increase in bus services in Central London, which contributed to significant increases in public transit patronage
- In the morning peak period in Autumn 2003 a total of 106,000 passengers were observed entering the charging zone on all Transport for London (TfL) buses, an increase of 29,000 (38%) on 2002¹
- A total of nearly 3,000 buses were observed entering the zone in the morning peak period during Autumn 2003, 560 (23%) more than 2002¹

No adverse business impacts

- Key business sectors showed positive trends in the years following the introduction of the scheme in comparison to pre 2003. The financial and business sector account for about 50% of the employment and 60% of the business units in the charging zone. The strong turnover growth of this sector continued before the onset of the credit crunch (2007). The annual profit performance in the charging zone is likely to have been boosted by the performance of these firms in the charging zone.

Figure 2: Profitability of all Businesses, pre and post charging



Sources: Dun and Bradstreet 2006/07, TfL Central London Congestion Charging Sixth Annual Impact Monitoring Report, July 2008

- The retail and hotel and restaurant sectors have recorded a stronger year on year business performance than outside of the charging zone.
- Little evidence of any impact on access to shops and services – users generally switched to a different mode where they no longer used the car as retail footfall has remained stable notwithstanding seasonal fluctuations, and has shown similar trends to the UK as a whole.

Figure 3: Business Sales and Profitability, pre and post charging



Sources: Dun and Bradstreet 2006/07, TfL Central London Congestion Charging Sixth Annual Impact Monitoring Report, July 2008

- Analysis of business start-ups and closures through Value Added Tax (VAT) registrations shows an annual rate of increase in VAT registered businesses locating within the charging zone is in line with the wider London trend. Since 2003, there have continued to be more registrations than de-registrations in Central London.

Figure 4: Net Annual Change in VAT Registrations and De-Registration, pre and post charging



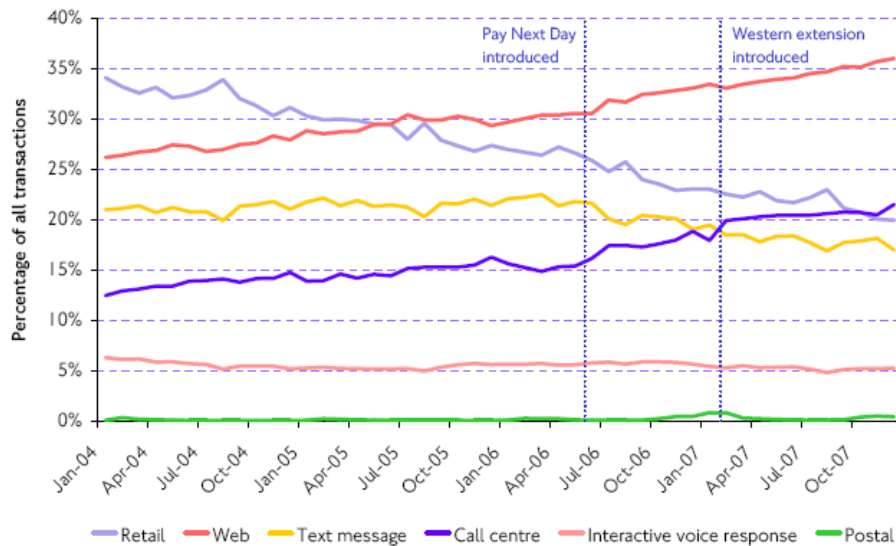
Sources: VAT registration analysis 2006, TfL Central London Congestion Charging Sixth Annual Impact Monitoring Report, July 2008
Congestion Charging, Second Annual Monitoring Report, TfL

- No adverse impacts on the property market within the charging zone with office and retail property growth in line with the rest of London.
- A report by AECOM on behalf of the Confederation of British Industry (CBI) concluded that road pricing schemes can deliver net benefits to business through reduced transport costs. Business trips to both financial and business services and retail will benefit directly due to the combined effect of reduced decongestion and the high value of time associated with these types of trips. However, consumers usually see a dis-benefit as a direct result of the charge (user pays principle). Transport improvements funded from congestion charging revenue exhibit further benefits for businesses as commuters and consumers benefit from decongestion and public transport improvements. The level of benefit depends upon the efficient use of revenues in supporting transport improvements; the length of time taken to deliver supporting improvements; and the degree to which road pricing is optimised to deliver maximum benefits to business. (By law, all net revenue raised by the charge must be invested in improving transportation in London.)
- There is confusion amongst business groups with regard to their transport costs which in conjunction with a lack of information on the impacts of road user charging on business, leads to an overall negative perception of the effects of charging schemes on profitability.

Implementation and Administration

Transport for London (TfL) is a local government body responsible for the transport network in Greater London, including managing the Congestion Charge. The methods of payment have changed since the scheme implementation in 2003, with a growing trend towards using automated payment channels.

Figure 5: Congestion Charge Method of Payment (January 2004 to December 2007)



Source: Transport for London (TfL); Congestion Charging, Sixth Annual Monitoring Report, TfL.

- 96% compliance with the scheme
- 60% pay using self service channels
- Online is the most used form of payment
- 73% of PCN are paid – vast majority at the discounted amount
- Foreign vehicles are not exempt – a European debt recovery agency is used with a collection rate of 38%

The enforcement process for the congestion charge is defined by law and shown below.



Several improvements have been made in terms of reducing the administration and compliance costs. During the operation of the congestion charge, the system and processes have been improved to provide efficiency savings and improve public opinion for the charge. These improvements include:

- Pay Next Day facility and a wider range of payment methods
- Improvements to the call centre (i.e. specialist teams to solve difficult queries) and website accessibility
- Re-procurement of the service provider / debt recovery agency agreements
- Possibility of future development of a transponder system

Governance

The devolution of central government powers to a local London government responsible for transportation and a mayor with strong executive powers was key. A two-year timeframe was set for implementation of the scheme with legal powers to introduce a charging scheme granted in 1999/2000, and a Road Charging Options for London (ROCOL) report published in 2000. The scheme implementation was effected by two distinct issues:

Political issues

- Congestion Charging was a key issue in the first Mayoral elections (2000)
- Scheme required delivery within the timescale of the Mayor’s first term of office (by 2004)

Delivery issues

- Assembling a project team
- Integration of in-house and management consultancy teams

- Procurement for the project delayed implementation

Equity and Distributional Considerations

The congestion charge has been seen to have a more profound effect on disabled users, parents with young children, and lower income groups.

Disabled people (many who qualify for a 100% exemption) were largely unaffected by the charge and TfL found no evidence of adverse impact on provision of services to disabled users. However, those who care for disabled/family members and visitors appear to have reduced the frequency of visits made during charging hours, which increased the feeling of loneliness and isolation for some during the day.

Surveys monitoring the impact of the charge reported that lower income users were more likely to report that their travel by car had either increased or decreased, but had not stayed the same. This suggests that the congestion charge places a higher burden on those with lower incomes, leading to two effects (i) encouraging them to avoid making day-time trips into the charging zone, and (ii) when avoiding such a trip is not possible, these low-income drivers tend to make multiple trips during the same day to make maximum advantage from paying the charge. Not surprisingly, those on a lower income were more likely to suggest that they found the charge difficult to afford.²

Overall Economic Efficiency

The overall efficiency impact of the London congestion charge has been evaluated by comparing the value of the changes in travel behaviour and the improvements in the performance of the road network within the charging zone to the capital and operating costs of the scheme.³ The ex-post evaluation was conducted based on the travel patterns in 2005 using two scenarios – a £5 congestion charge, which entailed a benefit-cost ratio of 1.5:1 (i.e. £1.5 of quantified benefits resulted from every £1 of capital and operating spending arising from the Charge) and an £8 congestion charge, which resulted in a benefit-cost ratio of 1.7:1 (i.e. £1.7 of benefits for every £1 of capital and operating spending). Most of the benefits take the form of travel time savings. The other quantified impacts – savings in vehicle operating costs, reductions in accidents, CO₂ and air pollution reductions – are relatively small by comparison.

The London Congestion Charge can be considered a policy success from several perspectives:

- (1) it was the first cordon charging scheme for a large western European city;
- (2) the scheme is now approaching its tenth anniversary and as such has stood the test of time and
- (3) post-implementation cost-benefit analyses have confirmed that the benefits of the scheme exceeded the capital and operating costs.

However, this policy success is tempered by the failure to extend the coverage area to the rest of Greater London, which is also very heavily congested.

References

¹ Congestion Charging, Second Annual Monitoring Report, TfL

² Congestion Charging: Sixth Annual Monitoring Report, TfL

³ See Reg Evans, "Central London Congestion Charging Scheme: Ex Post Evaluation of the Quantified Impacts of the Original Scheme" 29 June 2007. Downloaded from: <http://www.tfl.gov.uk/assets/downloads/Ex-post-evaluation-of-quantified-impacts-of-original-scheme-07-June.pdf>

3. Central Stockholm Congestion Charge (Swedish Transport Agency)

Introduction

The Stockholm Congestion Tax is a congestion pricing system implemented as a tax levied on vehicles entering and exiting central Stockholm. The congestion tax was implemented on a permanent basis on August 1, 2007, following a seven month trial period (January – July 2006) and successful referendum decision in late 2006.

The purpose of the Stockholm Congestion Tax is to reduce congestion and vehicle emissions in the inner city area (CBD). The implementation of the congestion tax was politically driven as it was initially introduced by the Green Party and Social Democrats as part of the larger full-scale trial. Initially, the trial was meant to consist only of a congestion charging scheme, but for mainly political reasons, it was complemented by the extension of public transit. The Stockholm Trial consisted of three parts: expanded public transport network, congestion tax and additional park-and-ride sites in the city and in the rest of the Stockholm county.

Primary Objectives:

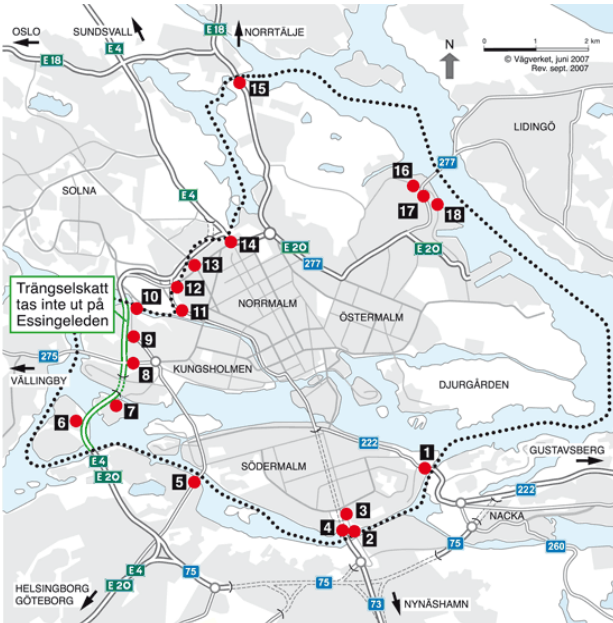
- Reduced Congestion
- Increased Accessibility
- Improve the Environment
- Provide resources for investment in road infrastructure in Stockholm

Secondary Objectives (during the 7 month trial period):

- Reduce traffic volumes on the busiest roads by 10 – 15% during rush hours
- Improve flow of traffic on streets and roads
- Reduce emissions of pollutants harmful to human health
- Improve the urban environment

Revenue Potential

Figure 6: Central Stockholm Congestion Charge Area



Source: Swedish Transport Agency
<http://www.transportstyrelsen.se/en/road/Congestion-tax/Congestion-tax-in-stockholm/>

The tax affects Swedish registered vehicles that are driven into and out of central Stockholm, Monday to Friday, 06.30 to 18.29. The tax is not charged on weekends, public holidays, and a day preceding a public holiday or during the month of July. A different cost is charged depending on the time of day.

Time	Amount (SEK)	Amount (C\$)
06:30 – 06:59	10	1.5
07:00 – 07:29	15	2.3
07:30 – 08:29	20	3.1
08:30 – 08:59	15	2.3
09:00 – 15:29	10	1.5
15:30 – 15:59	15	2.3
16:00 – 17:29	20	3.1
17:30 – 17:59	15	2.3
18:00 – 18:29	10	1.5

Exempt movements:

- To / from the Island of Lidingo (northeast of the congestion charge area) provided they exit the congestion tax zone within 30 minutes of entry
- Through traffic on the Western Relief Road (E4/E20 Essingeleden Highway)

Exempt vehicles include:

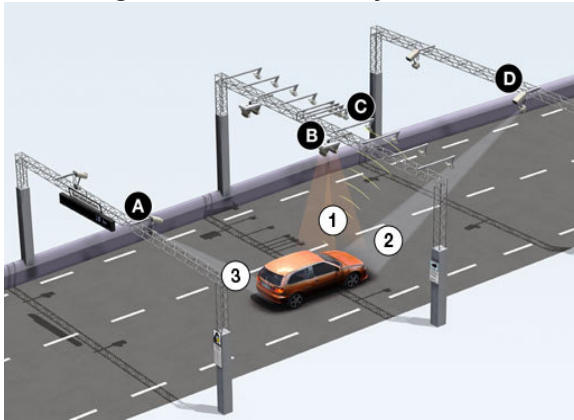
- Emergency and military vehicles
- Public buses (weight greater than 14 tonnes)
- Diplomat or Foreign registered vehicles
- Military vehicles
- Alternative fuel vehicles (vehicles run partially or completely as ECO-cars, LPG, Electric). Post July 2012 alternative fuel vehicles will no longer be exempt.

Technical System

- 18 control points on roads to monitor entrances / exits to the inner city to form a congestion tax zone encompassing Stockholm’s inner city
- Vehicles recorded and charged for crossing in both directions (with trips entirely within the charge zone are not charged)
- Vehicles are registered and identified automatically at control points using Automatic Number Plate Recognition (ANPR)

- Trips are registered automatically and the owner of the vehicle is responsible for the tax decision raised

Figure 7: Technical System Schematic of Central Stockholm Congestion Charge



Source: Swedish Transport Agency

<http://www.transportstyrelsen.se/en/road/Congestion-tax/Congestion-tax-in-stockholm/>

1. The vehicle passes a laser detector (B) which triggers cameras (D) and (A). An antenna for identification using transponders is no longer used (C).
2. A camera takes a photograph of the vehicle's front number plate (D).
3. A camera takes a photograph of the vehicle's rear number plate (A).

As the congestion tax is a tax and not a charge, it is deductible for both private individuals and businesses. Private individuals may deduct the congestion tax for business journeys and for traveling between the home and workplace according to the usual tax rules related to vehicle costs. Businesses may deduct all congestion tax expenses.

Revenue Impacts

Analysis of vehicle trips during a two week period in October 2008 showed that a small number of drivers contribute a large proportion of the revenue¹.

- 37% of all privately owned vehicles in Stockholm County paid the congestion tax on at least one occasion.
- Less than 4% paid SEK 200 (C\$ 31) or more during the period, accounting for one third of the revenues.
- 1/1000 cars in the dataset reached the maximum possible tax for a two week period – SEK 600 (C\$ 93).
- Taxable vehicles made on average 7 trips over the period / exempt vehicles on average 12.
- Average total revenue per vehicle SEK 83 (C\$ 13) / Average revenue per trip of SEK 11 (C\$ 1.70).

On an average day in May 2006 (during the trial)¹:

- 371,300 journeys crossed the cordon
- 115,100 journeys charged
- Revenue of more than SEK 3 million (C\$ 0.46 million)

Costs for the trial were paid by the Swedish Government. The overall implementation included a SEK 1.05 billion (C\$ 162 million) investment for the tolling system, from a budget of SEK 1.93 billion (C\$ 298 million). The capital cost to allow for the exemption of trips to/from the Island of Lidingo is estimated to have cost SEK 200 million (C\$ 31 million), plus ongoing exemption costs due to system downtimes.

Revenues are collected by an agency of the national government and transferred to the City of Stockholm. During the trial period, all revenues were invested in public transport in Stockholm. Following permanent implementation, a decision was made that all revenues would be used to fund new road construction in and around Stockholm.

Table 3: Central Stockholm Congestion Charge Revenue and Operating Cost

Gross Revenue SEK million (C\$ million)	Net Revenue SEK million (C\$ million)	Operating Cost SEK million (C\$ million)	Operating Cost as a % of revenue
2008: 850 (131)	2008: 457 (71)	2008: 393 (61)	2008: 46%
2009: 850 (131)	2009: 530 (82)	2009: 320 (50)	2009: 37%
2010*: 850 (131)	2010*: 650 (101)	2010*: 250 (39)	2010: 29%

*Forecast values

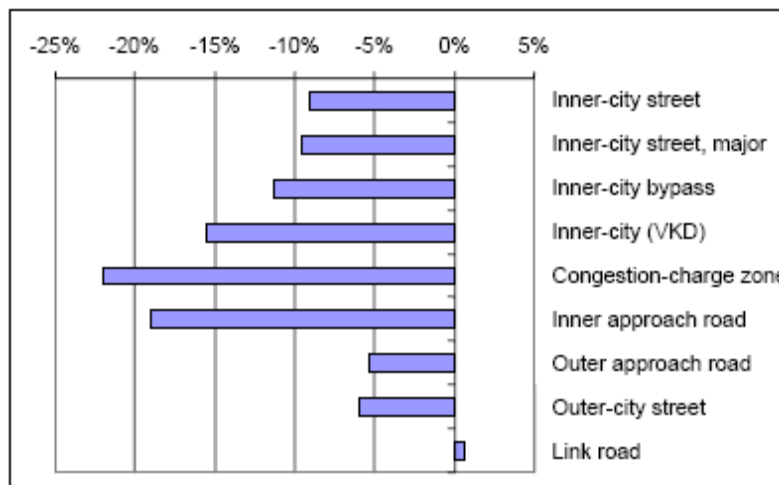
Sources: International Scan: Reducing Congestion and Funding Transportation Using Road Pricing, AASHTO;
City of Stockholm Traffic Administration, Analysis of Traffic in Stockholm Summary
Facts and Results from the Stockholm Trails, December 2006, Stockholmsforsoket

Behavioural Impacts

Reduced congestion in the Congestion Tax Zone

- During the trial in 2006, the number of vehicles crossing the tax cordon fell by 22% compared to 2005 (without the tax cordon)
- In 2008, the reduction in traffic across the cordon was 18% compared with 2005
- Level of traffic within the cordon zone was unchanged between 2007 and 2008. There is no tendency towards increased use of the road space freed up by the reduced traffic
- Traffic on orbital roads outside of the cordon zone has increased by between 5% to 10% compared to 2005, partly due to the underlying trend of increasing traffic but also due to drivers changing their traffic pattern to avoid the congestion tax zone

Figure 8: Average Traffic reduction during the Congestion Tax Trial (January – July 2006)



Source: Facts and Results from the Stockholm Trails, December 2006, Stockholmsforsoket

Improved environmental impact²

- Proportion of alternative fuel vehicles registered in Stockholm increased from 5% (of the total vehicles) in 2006 to 14% in 2008. The changes in the makeup of the vehicle fleet are not due exclusively to the

introduction of the congestion tax, but surveys show that exemption from congestion tax is the single most significant incentive for buying alternative fuel vehicles.

- Emissions of CO₂ from motor vehicles in cordon zone (inner city) fell by between 14 to 18% during the trial. Reductions of a further 4% have been estimated since permanent implementation of the tax despite the increase in traffic in 2008 from 2006 levels. These impacts include the combined effects of the congestion charge and the more fuel-efficient vehicle fleet.

Increase in public transport usage crossing the congestion tax zone

- 7% increase in public transport journeys crossing the congestion tax zone
- Approximately 50% of journeys no longer made by car have switched to public transport. In 2008, there were approximately 96,000 fewer journeys per day by car across the cordon compared with 2005. At the same time the equivalent increase in public transport journeys was 45,000.

No negative impacts for business in the inner city

- Turnover before and after the permanent implementation of the tax for retail, wholesale and motor vehicle and fuel sales show no negative impact on the overall turnover in the inner city when compared with the rest of Stockholm county
- Marginal influence on land use, real estate and regional economy compared to other factors
- It does not appear to have had any direct effect on the tourist trade

Infrastructure investments

- New commuter-train tunnel under the inner city; new train lines
- New Bypass and Northern Link roads

Implementation and Administration

The congestion tax was initially set up as a seven-month trial, due to be launched in tandem with transit improvements but the congestion tax system was delayed by six months due to procurement issues, whilst the public transport improvements were operational. During the trial, the toll collection system was installed to include both Optical Character Recognition (OCR) of vehicle number plates and short range communication (DSRC) antennas in conjunction with in-vehicle transponders. Transponders were available free to all users, (at cost to the Swedish Road Administration), although there was not a significant uptake (only 50% during the trial period). It is estimated that SEK 150 – 200 million (C\$ 23 – 31 million) was spent on transponder technology.

Since the permanent implementation of the congestion tax in August 2007, the technical system has been reviewed. As the system went permanent, it was understood that the OCR (system could achieve a suitable high level of accuracy so the transponder based option was not necessary. Therefore OCR cameras were used as the sole mechanism in capturing vehicles passages, reducing the overall system operating costs (as responders were not required). The vehicle's registration number is immediately identified by Automatic Number Plate Recognition (ANPR) cameras using the OCR technology, with information registered at control points and the tax decision stored in a database. Trips subject to tax are aggregated into a form of tax decision and the amount is paid in arrears; there is no need to pay at the roadside. The current operating system exhibits a high level of functionality, with approximately 82 million vehicle passages handled in 2008 at a 99.997% accuracy rate.³

During the trial, the system and operation was fully outsourced to a private contractor. Following a review it was decided to manage the system in house at the agency's own data centre as cost savings could be made. Responsibility for operation of the congestion tax was transferred on the 1st January 2009 from one government agency to another (from the Swedish Road Administration to the Swedish Transport Agency).

The Swedish Transport Agency is responsible for collection of the tax decision and issues payment slips on a monthly basis. The payment system was changed to issue tax decisions monthly rather than daily (as during the trial period). Bank transactions cost 10 to 20 times more by being charged by the day instead of by the month. During the trial, payment of the tax could be made in a number of ways including at convenience stores but this carried an additional transaction cost to the Road Administration. The process for payment was changed to direct payment between the vehicle owner and Swedish Transport Agency, thus saving on unnecessary transaction costs. The tax decision must be paid into the Swedish Transport Agency's congestion tax account no later than on the date stated on the payment slip. If the tax is not paid within the allocated timeframe, a reminder bill is sent with an additional cost of SEK 500 (C\$ 78). If the tax and reminder fee is still unpaid after a further 30 days, the case is passed on to the Swedish Enforcement Administration, incurring a further SEK 600 (C\$ 94) charge and the vehicle owner is noted in the Enforcement Register until payment is made. Alternatively, the tax can be paid for automatically using Autogiro (a form of direct debit).

Governance

In June 2003, Stockholm City Council adopted a proposal to conduct congestion charging trials in the City. By January 2004, the Congestion Charges Act was passed by the Swedish Parliament. In January 2006, a seven-month Government funded trial of the scheme (in tandem with an extensive increase in public transit services and Park and Ride facilities) was undertaken. In September 2006 following this trial, a referendum was held on the issue of permanent congestion charges in the City. All the political parties agreed that they would support the decision for a referendum, which voted marginally in favour of the tax. The tax was supported by 53% of Stockholm municipality although the results from 14 other local referendums on the tax were negative. Prior to the trial, polls showed that as many as 80% of Stockholm residents were against the idea of congestion charging. By August 2007, the congestion charging in Stockholm had been implemented.

Equity and Distributional Implications

Equity analysis of the Stockholm trial showed that men pay twice as much as women, change their travel behaviour more and on the whole do not benefit as much from the tax than women do. It was also shown that on average high-income groups pay three times more and do not benefit as much from the tax (on the whole) as low-income groups. There is a favourable impact on households with low to average income because of investments in public transport as a result of the tax. However, recent investments in road infrastructure have changed this impact in a fundamental way. Analysis of equity distribution shows that residents of the inner city and Lidingo pay nearly twice as much per person as residents of other areas. Geographical analysis shows that those most frequently paying the congestion tax live in areas surrounding the inner city with on average higher incomes and greater car ownership.

Analysis during a two-week period shows that 75% of the revenues come from around 20% of the vehicles in the region. However, almost half of the vehicles in the region paid the congestion charge at some point during the two week period, highlighting that [the cordon is also crossed by drivers who only occasionally travel into or out of the zone.](#)

Overall Economic Efficiency

The Stockholm congestion charge and associated measures have resulted in very large improvements in economic efficiency, including effects reflected in the performance of the city's transportation network and in the economic well-being of area residents. A cost-benefit analysis of the value of the time savings, emissions reductions and safety impacts of the charge indicate that these benefits (net of operating costs) are over four times greater than the

capital cost and associated set-up costs borne by the public sector. Specifically, the scheme yields a benefit cost ratio of 4.3:1 (based on a 20 year lifespan).⁴

The Congestion tax has resulted in significant mode shift, with a reduction in traffic in the charge zone and an increase in public transport patronage. The performance of the transport network has benefited as revenue from the tax is used to fund improvements to the public transport infrastructure, as well as road investment thus improving transport network.

Cost benefit analysis shows a reduction in consumer surplus,⁵ as expected, but the value of time savings represent a high proportion of the overall scheme revenue or charges paid (70%). This is high compared to most theoretical or model based studies. This is mainly due to 'network effects', i.e. significant amounts of traffic within the cordon which do not cross the cordon and hence do not pay any charge still benefit from the congestion reduction. Based on observed data from the trial and actual revenues in April 2006, the reduction in consumer surplus was estimated at -SEK257 million/year (-C\$38 million/year).⁴ Taking into account the social benefits, including safety and environmental effects, and public costs and revenues, the scheme yielded a surplus of SEK683 million/year (C\$ 102 million/year)⁴.

The Stockholm Congestion Charge can be considered a policy success from several perspectives:

- (1) longevity – it continues to be in place after five years
- (2) the scheme was implemented very efficiently, with operating costs coming in at well under 50 per cent of revenues, and
- (3) cost-benefit analyses have shown that the scheme generates benefits which outstrip capital and operating costs by a factor of more than 4:1.

References

¹ www.stockholm.se/trangselskatt

² Facts and Results from the Stockholm Trails, December 2006, Stockholmsforsoket

³ www.stockholm.se/trangselskatt

⁴ "Cost-Benefit Analysis of the Stockholm Congestion Charging System", Jonas Eliasson, Transek AB, Sweden

⁵ Consumer surplus is defined as the difference between the value that individuals attribute to the trips and what they pay for these trips through the congestion tax, fares, auto operating costs and other outgoings.

4. Commercial Concentration Tax (Toronto)

Introduction

The provincial government imposed the Commercial Concentration Tax (CCT) to fund transit and road programs throughout Ontario. The CCT was based upon the rationale that those who would likely benefit from the proposed improvements (i.e. transportation users), should also be funding the projects.

Revenue Potential

The CCT applied only to commercial paid parking.

The CCT was introduced under the Commercial Concentration Tax Act of 1990. It was subsequently repealed in 1993. There are currently no specific taxes relating to parking use in Toronto.

Under this Act, taxable commercial property included office and retail buildings, condominiums, and also parking lots. In order to be liable to taxation, the commercial property had to have a gross area exceeding 18,600 square metres (approximately 200,000 square feet).

The geographical coverage of the tax extended to the entire Greater Toronto Area (GTA), incorporating the City of Toronto and the regional municipalities of Durham, Halton, Peel and York.

A property meeting the above criteria was subject to an annual taxation rate of \$10.75 per square metre (\$1.00/sf).

Exemptions from the CCT included residential or industrial property, race tracks, pipelines, trucking depots, warehouses, research and development facilities, or other land exempt from taxes for municipal and school purposes by any other Act (apart from a commercial parking lot operated by a municipality or local board).

Revenue Impacts

The CCT was developed by the Province as a primary means to fund its five-year, \$2 billion Transportation Capital Program for road and transit projects. During the three years in which the CCT was in place, it raised over \$100 million per year.

Behavioural Impacts

In suburban areas, where parking rates were generally low, the CCT caused many municipalities to abolish their parking fees so that they did not have to pay the CCT. The Toronto Transit Commission (TTC) also abolished fees on its Park & Ride lots. It is estimated that GO Transit would have had to charge \$4 at its parking lots just to cover the costs of the CCT.

It is considered that the CCT did not have a significant impact on regional travel behaviour, in the overall context of already declining travel as a result of the recession of the early 1990s. The majority of drivers in the GTA continued to be able to park largely for free outside of the City; however if they had faced a charge then the impact of the CCT could have been far greater. Even in downtown Toronto, where the CCT was introduced in addition to existing parking charges, transit use was already high and those who drove into the downtown did so for reasons which were not affected by a slight increase in the cost of parking.

Governance, Implementation and Administration

The CCT Act permitted the Province to carry out land assessments for the purposes of tax collection and obstruction to this process was punishable by a fine of up to \$1000. Annual tax bills were sent to the land owner(s), with the penalty for late payments (after 30 days of issue) equal to 5% of the tax payable up to \$10,000.

The CCT was a significant expense for parking authorities, such as the Toronto Parking Authority, accounting for over 16% of its annual operating expenses between 1990 and 1992.

Equity and Distributional Implications

As the CCT was only collected in the GTA, it was considered to be unfair for the region because a portion of the revenue generated was used to fund transportation projects elsewhere in Ontario. Furthermore, as the CCT only applied to commercial paid parking, it was considered to particularly affect downtown Toronto, as this is where the majority of paid parking was located.

It is also likely that a CCT would not be evenly distributed among drivers. Specific geographic or personal circumstances may be more likely to require the use of paid parking for non-discretionary trips such as medical appointments, or for those living in the city centre. These drivers may generate fewer vehicle kilometres travelled, yet pay a higher portion of the CCT.

As previously stated, one of the organizations most impacted upon was the TTC, largely because of the amount of Park & Ride parking that it provided.

The CCT was also criticised because it resembled a property tax, and so was considered to be a form of double taxation, and was poorly timed during the recession.

Overall Economic Efficiency

The CCT had little impact on travel behaviour and as such it did not promote a more efficient use of the transportation network and realize any of the benefits associated with this, including mode shifts, decongestion benefits, reduced vehicle usage costs or other environmental externalities. In addition, a sales tax on commercial parking applies to a relatively narrow tax base as only a small proportion of parking transactions would attract the tax, roughly 5%-10% of non-residential parking within the City of Toronto.

Targeting non-residential parking solely in the downtown area is also inconsistent with wider policies designed to stimulate economic development in the downtown, as businesses in that location are placed under a competitive disadvantage. At the time of the imposition of the tax, Canada experienced a sharp economic downturn (between 1990 and 1993), with the GTA accounting for half of Canada's job losses, particularly in Toronto itself and in North York. The CCT was perceived to have exacerbated the negative impact on the local economy.

References

- Hemson Consulting Ltd. "Assessment of Potential New Tax Measures Under the City of Toronto Act, 2006" (2007)
- http://www.e-laws.gov.on.ca/html/repealedstatutes/english/elaws_rep_statutes_90c16_e.htm
- http://parking.greenp.com/documents/pamphlets/pa_00000005.pdf

5. Congestion Levy (Melbourne City Council, Australia)

Introduction

Traffic congestion imposes significant financial, time, environmental costs and is an increasing challenge to Melbourne's economic prosperity. The Bureau of Transport and Regional Economics estimates that congestion costs in Melbourne amount to approximately \$3 billion (C\$ 3.08 billion) per year and are set to rise to approximately \$6.1 billion (C\$ 6.26 billion) by 2020¹ under the current policies.

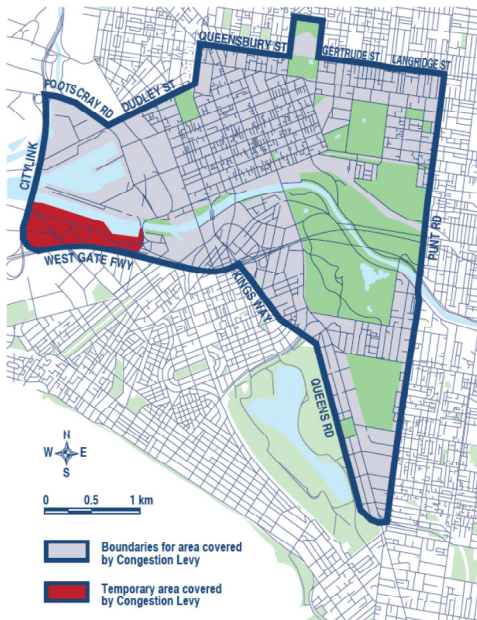
The Melbourne Congestion Levy is an annual tax that applies to commercial and private parking spaces that are designated as long stay in Melbourne's central business district (CBD). This includes non-residential, off-street and permanently leased parking. It is payable by owners of private parking spaces and operators of public parking spaces. On-street and residential parking is exempt, along with other exemptions as discussed in this case study.

The primary aim of the Levy is to reduce traffic congestion in Melbourne's inner city and encourage the use of public transport by commuters. A secondary aim is to create more parking options for shoppers and visitors through increased availability of short-stay parking spaces; and to generate revenue for transport infrastructure projects.

Revenue Potential

The Levy was introduced in 2006 in an area covering Melbourne's central business district (CBD). The area covers 14.6km² in central Melbourne, encompassing Melbourne's major commercial, retail and entertainment precincts, as shown by the blue line in the Levy Area map.

Figure 9: Melbourne Congestion Levy Area



Following an initial price increase in the first year, the levy increased in line with Melbourne CPI. For the area bounded by blue line, the historical and current levy rates are listed below as per the Victoria SRO website:

- \$400/year (for 2006) (C\$ 415)
- \$800/year (for 2007) (C\$ 830)
- \$820/year (for 2008) (C\$ 850)
- \$850/year (for 2009) (C\$ 880)
- \$860/year (for 2010) (C\$ 890)
- \$880/year (for 2011) (C\$ 910)

For the area highlighted in red, a lower levy is charged. This is due to the developing nature of the area, with some streets not being part of the formal public road network, thereby making the monitoring and enforcement of parking challenging. In this area, the Levy is:

- \$400/year (for 2006-2011) (C\$ 415)
- \$650/year (for 2012) (C\$ 675).

Source: State Revenue Office (SRO), State Government of Victoria

<http://www.sro.vic.gov.au/sro/SROnav.nsf/childdocs/-34FAD0EFBAFF8BE0CA2575A100442101-FC77363A0C599339CA2575D10080B7AB-93ABDDC73987F460CA2575D20022941E?open>

The Levy is payable by owners of private car parks and operators of public car parks in the relevant area, applicable to non-residential, off-street, long stay and permanently leased parking spaces. If the owner is liable for the Levy they must register with the State Revenue Office Victoria (SRO).

Private car parks can range from a single parking space to a building with several parking spaces. All private car parks are considered to contain only long stay parking spaces. A concession (reduced levy amount) applies to each parking space that is exempt or not used as a long stay space for 30 days or more a year (exemptions listed below). This concession is requested when an owner completes their Annual Return Form, which calculates the levy amount payable for the previous year.

For public car parks, the operator of the car park is responsible for paying the levy with the discretion of passing this cost onto the car park users, through increased parking charges.

In public car parks, a long stay parking space is a parking space that is:

- available for use on an ongoing basis by the owner or by another person under lease, licence or arrangement with the owner, or
- used for a period of four hours or more on a weekday, commencing at or before 9.30am and ending at or after 9.30am

Although figures suggest that over 80% of spaces in public car parks in the Melbourne CBD are long stay parking spaces (thus liable to the levy), only 75% are treated as long stay parking spaces. This is the statutory ratio, which was set based upon advice from the City of Melbourne and industry experts. The use of a ratio is intended to reduce the compliance workload for car park operators, when calculating their annual levy amount. If the operator believes that the 75% ratio is too high, they can seek approval from the SRO to use a lower ratio. In addition, a reduction in the levy amount applies to each space that is exempt for part of the year, or not available as a long stay parking space for a full year.

Exemptions from the Levy consist of:

- Loading bays
- Guest parking at hotels, apartments etc.
- Parking spaces owned by consulates and consular employees
- Parking for emergency vehicles
- Parking for people attending special events
- Visitor parking including hospital parking
- Residential parking (if it is not leased out)
- Parking spaces owned by councils, charities, universities, libraries, museums
- Disabled parking
- Parking for shift workers
- Parking for fleet vehicles
- Bus layovers
- Car sales and car hire spaces
- Car service spaces

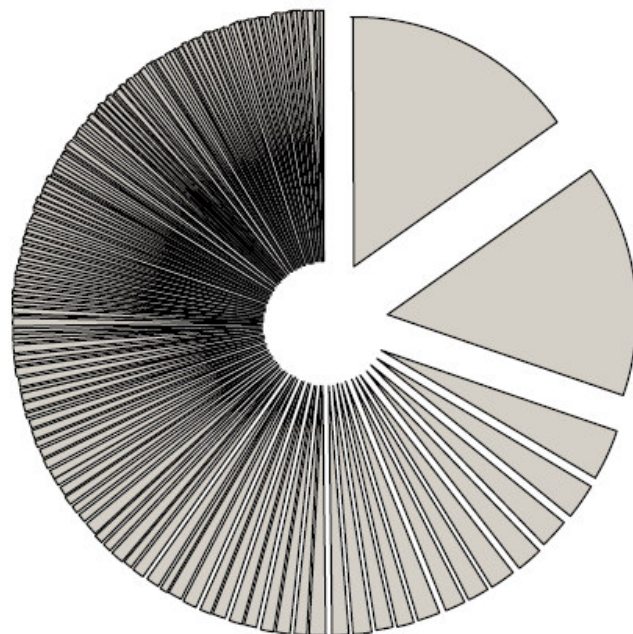
Revenue Impacts

The Levy was payable on about 56,000 parking spaces in the Levy Area in 2006 and raised approximately \$19 million (six months) in the 2005/06 financial year

Around a third of the Levy revenue is paid by the two largest levy payers and approximately 50% of Levy revenue is paid by the top 15. The remaining levy payers each contribute less than 1% of the total Levy revenue. Levy payers are either car park owners of private car parks or operators of public car parks. However, this does not take account of the proportion of owners or operators who then pass the cost to the user, under a rental agreement or higher parking charges.

Recent Revenue Yields:
2009/10 \$ 47.2 million (C\$ 48 million)
2010/11 \$ 44.1 million (C\$ 45 million)

Figure 10: Proportion of Total Revenue from Each Levy Payer (2006)



Note: each wedge represents a single levy payer

Sources: Review of the Administration of the Congestion Levy, April 2007, Department of Treasury and Finance, State Revenue Office (Victoria);
Review of the Administration of the Congestion Levy, Department of Treasury and Finance (DTF) and the State Revenue Office (SRO);
Financial Report for the State of Victoria 2009-10;
Financial Report for the State of Victoria 2010-11.

Behavioural Impacts

Reduced traffic volumes in the Levy area:

- 6% reduction in the average weekday traffic volumes in the Levy area between February 2005 and August 2009 (despite a 25% increase in employment between 2004 and 2008)²
- Reduction is not solely due to the Levy – main driver is likely to have been the steep rise in petrol prices between mid-2005 and mid-2008 (60% increase), as well as increased alternative forms of transport³
- The full cost of the Levy is not borne by drivers, only 32% of drivers pay for parking; 23% employer; 4% other; 41% no fee⁴
- Effectiveness of the Levy is undermined by the extent to which the Levy is not passed on by parking providers – estimated that only 11% of the theoretical reduction in car demand has been achieved⁴

Increased parking costs and reduced long-stay parking supply impacts:

- 2.7% decrease in long-stay parking spaces between 2006 and 2010²
- 25% increase in short-stay parking spaces over the same period²
- Long-stay parking prices increased by 15% between September 2005 and February 2007 (during which time the Levy doubled) – well above the 3.5% CPI growth for the same period²
- Average hourly parking price in the Levy area rose by a similar amount to long-stay prices – indicating the cost of the Levy by some operators may have been passed onto short-stay parking²

A shift to non-car transport

- According to the City of Melbourne Users Survey 2006, 4% of travellers in and to the CBD who switched from car to non-car transport did so as a direct result of the Levy²
- In 2006 when the Levy was introduced, 29% of travellers in and to the CBD who switched to non-car transport cited parking costs as a factor for their decision²
- Similar surveys in the wider Melbourne area have highlighted that parking costs affected travel choice when the Levy was introduced in 2006 (15% of people cited parking costs as a reason for switching to non-car transport in 2006; 8% in 2009)²
- Public transport patronage has shown a strong increase in the past 10 years and has accelerated since 2005/06²
- Increase in the mode share of the public transport for journeys to work and education is highest in Victoria (compared with the whole of Australia)²

Parking space supply responding to business needs

- 24.9% increase in short-stay parking between 2006 and 2008, corresponding with a 25.3% increase in retail turnover for the same period²
- 0.4% increase in short-stay parking between 2008 and 2010 corresponds with a subsequent slowdown in retail turnover, which fell by 0.35% for the first quarter of 2008 to the first quarter of 2010²
- This highlights a logical relationship, short-stay spaces targeted at those driving into the CBD for leisure and retail purposes

Projects to encourage sustainable modes of travel completed by the City of Melbourne with Levy funding:

- New bicycle paths, footpath widening and pedestrian and cycling road safety improvements
- Pedestrian amenity upgrades and the installation of way finding signage
- Completion of a pedestrian and cycling bridge (partial funding)²

Implementation and Administration

The SRO is responsible for the collection of the levy. The SRO sends out annual return forms in November each year. The annual return form provides details of parking space usage from the previous year, and is used by the SRO to enforce payment. Owners and operators must lodge the annual return by the following 21st January. Using the information from the annual returns, the SRO issue assessments providing the option of payment in full or by four equal quarterly instalments (21st of March, June, September and December). Reminder notices are issued to those who elect to pay by instalments. Following the first year of operation, the SRO was concerned by the low level of compliance with Annual Returns. As part of its compliance program, the SRO ensures that long stay parking spaces both public and private are registered. The SRO aims to improve compliance levels in the collection of congestion levy by:

- Identifying unregistered owners/operators from land tax data and information obtained from external bodies (such as local councils).
- Conducting investigations into registered car park owners/operators who fail to lodge returns and pay their levy as a result of default assessments.
- Conducting audits on a number of owners/operators who are claiming exemptions for parking spaces.
- Reviewing car parks with approved variations to the statutory ratio.

Commonly identified errors are:

- Lack of understanding of the requirements of the legislation, especially in relation to determining what is an exempt parking space for shift workers
- Non-lodgement of returns
- Non-registration of leviable car park

Governance

The Congestion Levy was announced by the Victorian Government, Office of the Treasurer on 22 April 2005, and was presented to Legislative Assembly and Council on 5 October 2005 and 26 October 2005 respectively. The long title for the Bill for this Act was "to impose a levy on long stay parking spaces in the central business district and inner Melbourne to reduce traffic congestion, to amend the Taxation Administration Act 1997 and for other purposes." The Congestion Levy was assented on 2 November 2005 and came into effect on 1 January 2006, as defined by the Congestion Levy Act 2005. The Department of Treasury and Finance (DTF) and State Revenue Office Victoria (SRO) are responsible for administration of the Act. In line with the Government's commitment to review administration of the Levy one year after introduction, the DTF and the SRO conducted a review of the Levy's implementation. In 2010, a review into the effectiveness of the Levy in reducing congestion was undertaken by the DTF.² (The results of the review were presented above in the section on behavioural impacts.)

The levy followed similar initiatives in other Australian and international cities that attempted to encourage a reduction in private motor vehicle traffic in congestion areas as the Government and Melbourne City Council (MCC) looked at tackling traffic congestion in the city. The Levy is one component of the Government's suite of measures to tackle traffic congestion. \$5 million (C\$ 5.08 million) is given to MCC annually to fund transport initiatives.

Equity and Distributional Implications

In terms of horizontal equity (i.e. whether the Levy payers are also the beneficiaries), this tool is a mediocre performer, because the Levy was borne to a large extent by private car park owners and not fully passed onto users, who are the primary beneficiaries in the sense of being both the parking space users and the beneficiaries of the

transportation infrastructure improvements. Owners of commercial parking lots were not able to pass on the full Levy to users due to weakening market demand for parking and other owners of private non-residential parking lots also did not fully pass on the Levy through their monthly lease rates.

The portion of the Levy that was passed on to users in either private or publicly owned car parks was equitable in horizontal equity terms due to its user pay feature.

In terms of vertical equity (i.e. impact across income groups), neither the portion borne by car park owners nor the portion passed onto users had significant adverse vertical equity impacts. Studies have shown that people on lower incomes are more likely to travel into the City for work by public transport, whereas 55% of those working in the City with weekly incomes over \$2,000 (C\$ 2,032) travel to work by car. Moreover, various exemptions are granted to minimize the impact on vulnerable users, such as the disabled.

Complementary and other measures

The DFT and SRO jointly conducted a review of the Congestion Levy in early 2007, one year after implementation. The review made a number of substantive recommendations including:

- Providing transitional relief by freezing the Levy amount until 2011 for an area (bounded by Montague Street, the West Gate Freeway, City Link and the Yarra River) around Port Melbourne.
- Amending the Act to clarify the Government's objectives in imposing joint and several liability on owners and operators – completed in December 2007 with amendments to the Act.

The review also indicated other administrative improvements (completed mid-2008):

- amend relevant forms to accommodate mid-year changes of car park management
- finalise its review of the procedures for registration of owners and operators of public car parks
- improve the clarity of information of annual returns and assessment forms
- follow up outstanding annual returns and investigate late lodgements
- investigate the feasibility of adjusting instalment dates for payments
- standardize forms for car park users seeking exemptions
- enhance ease of access to Levy material on the SRO website

Overall Economic Efficiency

The overall efficiency impacts of the Congestion Levy have been mixed. We distinguish below between the portion of the Levy that was passed onto users and that which was borne by owners or operators of car parks.

The portion of the Levy that was passed onto users has had mainly positive behavioural impacts, but this was a relatively small share of the overall Levy. These behavioural impacts were driven by an increase in long-stay parking prices, a reduction in long-stay parking supply and an increase in short stay parking, all of which support more sustainable travel patterns across the CBD. As a result, there have been increases in the number of people travelling to the city by public transport and other sustainable means and a reduction in the number travelling by car, but the Levy was not the sole reason for these changes. However, not all the charges that were passed onto users resulted in desirable changes in behaviour, partly due to the prevalence of employer-paid parking and partly because some of the Levy spilled over into higher prices for short-stay parking, with the latter being an unintended effect of the Levy.

The bulk of the Levy was not passed onto parking users due in part to weak market demand conditions among private commercial car park operators. With the exception of driving a reduction in long stay parking supply, this portion of the Levy was largely ineffective. Moreover, this portion was as an effective tax on capital for private car park owners. As such, this portion of the Levy created significant economic distortions which partly or wholly offset the positive behavioural changes from pass-through portion of the Levy.

References

-
- ¹ Bureau of Transport and Regional Economics, 2007, Estimating Urban Traffic and Congestion Cost Trends for Australian Cities, Working Paper 71
 - ² Review of the effectiveness of the Congestion Levy, May 2010, Department of Treasury and Finance
 - ³ Review of the Administration of the Congestion Levy, Department of Treasury and Finance (DTF) and the State Revenue Office (SRO)
 - ⁴ Parking Price Policies – A review of the Melbourne congestion levy, Hamer, Currie and Young

6. Employer Payroll Tax Dedicated to Public Transit (Versement de Transport, France)

Introduction

The Versement de Transport (Transport Tax), or VT for short, is an employer payroll tax created by French Law in 1971; which now represents one of the major resources for financing new and existing public transportation in French municipalities. Public transportation in municipal regions required additional sources of funding as the revenues from ticket sales and government subsidies alone did not cover the full capital and operating costs. Therefore, in the early 1970s, the French government created the Versement de Transport, to provide an additional source of revenue to fund public transportation.

The objective of this payroll tax is to fund public transportation in urban areas, including capital and operating expenditures.

The introduction of the payroll tax was made possible in the early 1970s by the view that there would be fuel shortages and cars would cease to be the only mode considered for future transport mobility. The tax can be applied by local passenger transportation authorities across the whole of France, if they so desire. This case study focuses on the application of the transport tax with specific examples of the application in the region of Ile-de-France, that contains the capital, Paris.

Revenue Potential

The tax is payable by all public and private companies, with at least 10 employees, situated within a Transport Authority (TOA). The tax is levied on employers through the system of social security but paid directly to the TOA. The tax amount is calculated based on employees' wages (gross salary). Companies are liable for the tax in the TOA regions where they are located and not based on staff numbers at a national level. Therefore, a company may have to pay different levels of tax depending on the size and location of offices across the country.

The tax amount varies between regions and is governed by the local TOA, within the limits of the maximum rate set by law. Basic payroll tax rates for the VT outside Ile-de-France are capped at:

- 0.55% (of salaries) – municipality population is between 10,000 to 100,000
- 0.85% (of salaries) – municipality population is between 50,000 to 100,000 and the TOA has decided to invest in public transport infrastructure (reduced to 0.55% if no work has commenced within 5 years of the increase)
- 1% (of salaries) – municipality population greater than 100,000
- 1.75% (of salaries) – municipality population greater than 100,000 and the TOA has decided to invest in public transport infrastructure (reduced to 1% if no work has commenced within 5 years of the increase)

Supplementary tax rates

- Municipalities and communities that create an urban agglomeration (i.e. larger jurisdiction) may increase the rate by 0.05%
- TOAs comprising of one or more common tourist area can increase the rate by 0.2%

The basic tax rates in the Ile-de-France region are higher because of the size of the public transport operation and the associated investment requirements. The rates vary between the prosperous business district and outer suburbs:

- 2.6% (of salaries) – Paris and the neighbouring Hauts-de-Seine (includes La Defense business district)

- 1.7% (of salaries) – inner city suburbs
- 1.4% (of salaries) – for the outer suburbs

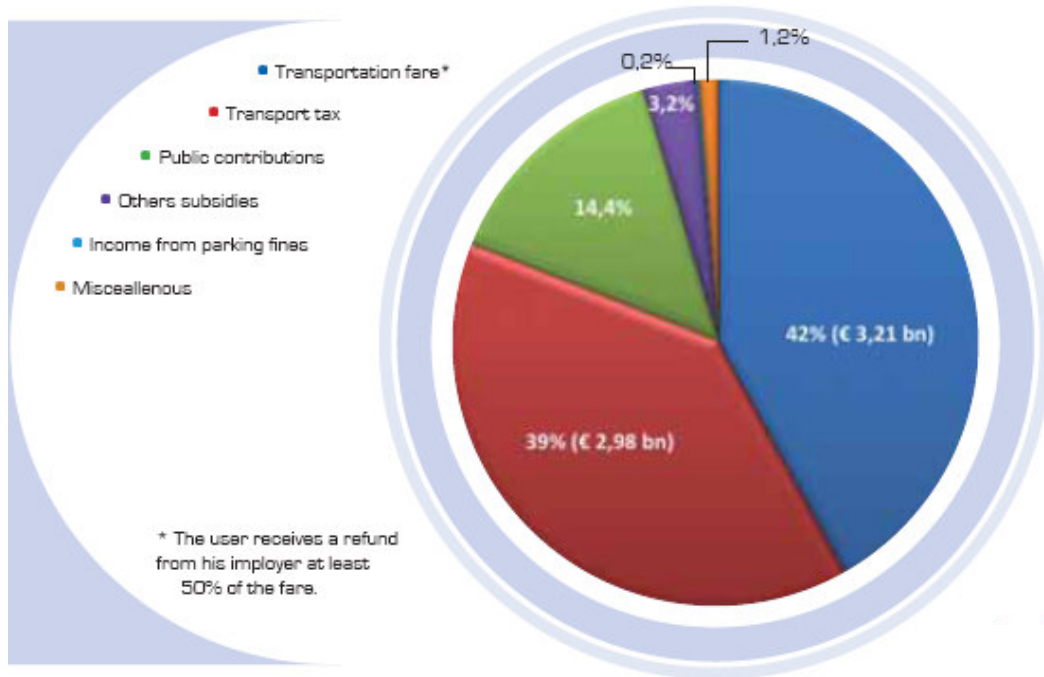
Employees included in the count are all full time employees including casual workers and home workers. Part-time employees are also included, based on the proportion of their working week. Employees exempted from the VT include:

- Apprentices and internships
- Students on vocational training at a centre
- Seconded Foreign employees

Revenue Impacts

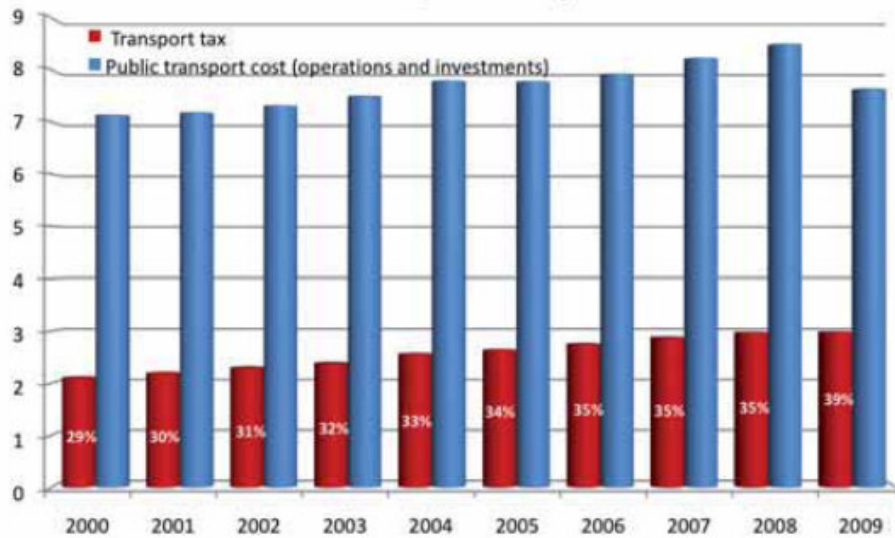
In 2009, in the Ile-de-France region, public transportation operating and capital costs totalled approximately €7.6 billion (C\$ 10.5bn)¹. The Transport Tax is one of the main sources of revenue for public transport (operating and capital costs) in Ile-de-France, accounting for 39%, second only to income from transport fares (42%).

Figure 11: Funding public transport in Ile-de-France (2009)



Source: CAPRICE (Capital Regions Integrating Collective Transport For Increased Energy Efficiency) A Decision Maker's Guide, A wealth of experience, simplified choices.

Figure 12: Transport Tax and Public Transport Cost in Ile-de-France (current, € billion)

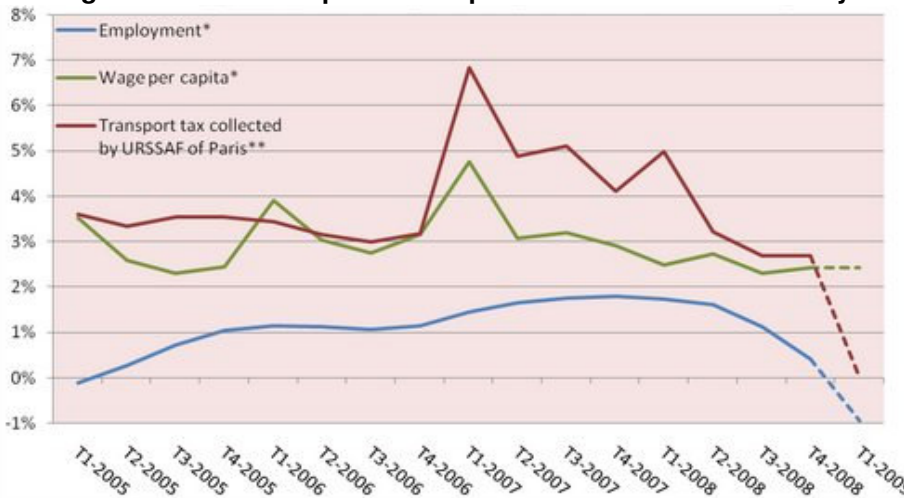


Source: CAPRICE (Capital Regions Integrating Collective Transport For Increased Energy Efficiency), A Decision Maker's Guide, A wealth of experience, simplified choices

Limitations of the Transport Tax

As the transport tax is one of the transport authority's main sources of income, it must be forecast precisely in order to provide an accurate reflection of the potential transport budget. Indeed, these payroll tax revenues are highly correlated to economic activity. However, government subsidies compensate when tax revenues fall short and the City of Paris government is required by law to make up any funding deficit if service improvements are required.

Figure 13: Transport Tax Dependent on Economic Activity



Source: CAPRICE <http://www.caprice-project.info/spip.php?article30>

Behavioural Impacts

There are no impacts on travel behaviour due to this revenue tool since the charge is not incurred as a result of any type of travel.

The tax is recognised as an important tool in funding new public transport infrastructure, like modern trams or rapid transit systems across France. In the Ile-de-France region, the transport authority decides each year on the total amount of the public contributions which will be shared between the members (who operate the transport system like RATP). In 2009, the contributions were split, 51% for the region of Ile-de-France, 30.4% for the city of Paris, and the remaining 18.6% for other counties of Ile-de-France.²

Implementation and Administration

The transport tax is a local tax levied through the social security system on employers in a TOA and is collected and returned to transport authorities by the URSSAF (Unions de Recouvrement des Cotisations de Sécurité Sociale et d'Allocations Familiales), external public bodies that recover social security contributions. URSSAF retain 1% of the tax income for administrative costs.

The TOA have the authority to set the rate of tax for all employers in their region, within the limits set by law and the size of the region. More than three quarters of the TOAs have fixed the level of VT at the maximum allowed. The VT, although accepted with some reluctance by employers, has largely contributed to the rehabilitation of urban transport networks in France. However, employers have been openly hostile in some instances where TOAs proceed with a major infrastructure investment, because these investments trigger an increase in the maximum allowable rate from 1% to 1.75%. In the case of Rennes, the municipality finally prevailed against official complaints from employers. On the other hand, at least two similar projects have had to be abandoned because of the determined opposition, in Brest and Reims³.

Governance

Since the 1970s, the French state has encouraged the development of urban transport projects by giving local authorities the responsibility for planning and developing schemes. The Regional Urban Transport Authority has the right to impose the local transport tax in line with national policy to raise revenues to fund public transport projects in the region.

The tax was originally intended to raise capital for investment in public transport infrastructure in the Paris region (1971), but it has been progressively widened to urban areas of more than 300,000 inhabitants (1973), 100,000 inhabitants (1974), 30,000 inhabitants (1982), 20,000 inhabitants (1992), and 10,000 inhabitants (1999).

It has strong political support, which is one reason why it has been a successful tool for raising capital for investment in public transport schemes. The tax was initially created to finance new public transport infrastructure, but more recently has been used to finance operating costs of public transport. In recent years, the tax has been used to support investments in public transportation by TOAs. Authorization of a tax increase to fund such transport investments requires a business case justifying the potential economic benefit of the transport scheme for the region.

Equity and Distributional Implications

The transport tax (VT) rate varies by location, with areas that are more likely to be able to take advantage of public transport paying more (higher tax areas), suggesting some measure of horizontal equity. In Paris, the region's decision to tax poorer suburbs bordering Paris at a lower rate serves as a social equaliser, attempting to encourage investment in less-well off areas. However, since the tax only applies to companies with more than nine employees; it is designed to give a break to very small firms which can create potential economic distortions.

Other complementary measures and exemptions cover nonprofit entities and certain employers that do not require their employees to travel to work. Non-profit entities are exempt as are companies that meet or exceed the threshold of 10 employees for the first time, post introduction of the tax (post 1996):

- Full exemption for 3 years (effective from the first day of the month which the employer is subject to VT)
- 75% reduction for the 4th year
- 50% reduction for the 5th year
- 25% reduction for the 6th year

The tax is also reimbursed to employers who provide lodging for their employees at the place of work; those who provide transport services for their employees or those located in 'new' towns.

In 2009, refunds in Ile-De-France were € 52.5m (C\$ 72.5m), or 2% of the total revenue collected.⁴

Overall Economic Efficiency

The efficiency impacts of the transport tax are difficult to assess as the tax has been in operation in Paris since 1971 and in the wider regions since the mid 1970s. On the whole, it is accepted by French employers who pay the tax as a business cost although there are instances when there is opposition to increases in the tax (to fund public transport investment).

The economic justification for the tax is the important role that public transport plays supporting the labour market, especially because employers have access to a larger pool of labour if there is an efficient transport network. With finance from the VT, metro systems have developed in major cities across France helping to save city centres from economic decline, revitalise inner city districts, and improve city centre environments. A further case for seeking public funding may be found in urban economic growth especially in cities that have had decline in heavy industries and that have decayed areas.

The inefficiency costs associated with a payroll tax such as VT should in principle be relatively low in that the tax is applied to a large tax base (employee payrolls). However, the significant differences in tax rates across different parts of Paris (and different parts of the country) would be expected to raise the inefficiency costs considerably, since it is likely to shift economic activity and the location of job creation.

The administrative costs (capital and operating) associated with the VT should be minimal in principal (possibly in the range of the 1% administrative charge imposed by the collection agency, the URSSAF). However, the compliance costs imposed on employers may be more significant, because firms with multiple offices or plants in different parts of Paris need to take account of any changes in employee office locations when submitting payroll tax receipts. This represents an additional administrative burden as compared to collecting payroll taxes in an environment where the tax rates do not depend on employee location.

References

¹ http://www.caprice-project.info/IMG/pdf/Guide_Caprice_2Mo.pdf

² http://www.caprice-project.info/IMG/pdf/Guide_Caprice_2Mo.pdf

³ Review of French Experience with Respect to Public Sector Financing of Urban Transport, Berger, 2000

⁴ <http://www.toll-collect.de/frontend/press/picturearchive/BigPictureVP.do;jsessionid=205D597BEC81FB01F9B23559E79377D9.app02?primaryKey=515>

7. Greater Manchester Congestion Charge

Introduction

The Greater Manchester Congestion Charge formed part of a proposal to the Government's Transport Innovation Fund (TIFUK) for a £2.77 billion (C\$ 4.41 billion) package of transport funding in return for the introduction of a road pricing scheme¹. TIFUK was a funding mechanism whereby local council authorities could bid for funds for their own package of transport schemes that combined demand management with a coherent anti-congestion strategy.

The funds were to be spent on modernising Greater Manchester's transport network, with large scale extensions to the Manchester Metrolink system as well as increased bus and rail services and investment in public transport infrastructure. Of the funds, £1.15 billion (C\$ 1.83 billion) was secured in prudential borrowing against charging revenues from the scheme, £1.44 billion (C\$ 2.29 billion) in TIFUK grants and £109 million (C\$ 174 million) in local contributions.

The objective of Congestion Charge was to:

- To secure funding for investment in public transport infrastructure and services
- To reduce congestion in Greater Manchester

Revenue Potential

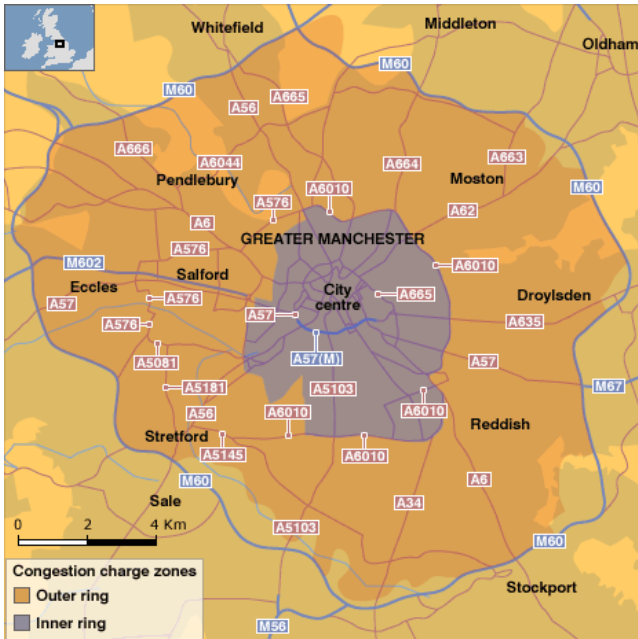
The scheme consisted of a two-ring cordon charging zone (covering an area of approximately 80 square miles)

- Outer Ring – just inside the M60 orbital motorway
- Inner Ring – roughly corresponding to Manchester City Centre (although at the time of consultation it had not been explicitly defined)

Operations would be characterised by:

- No weekend or bank holiday charges
- Peak period weekday charges only
- Journeys within the rings and orbital journeys would not be charged
- Only journeys crossing the cordon at the particular time would incur a charge
- Fixed charge for all vehicle classes not exempt

Figure 14: Greater Manchester Congestion Charge Area



Source: Manchester City Council

<http://news.bbc.co.uk/1/hi/england/manchester/7778110.stm>

Charges	
Inbound	Outbound
07:00 – 09:30	16:00 – 18:00
Outer Ring £2 (C\$ 3.20)	Outer Ring £1 (C\$ 1.60)
Inner Ring £1 (C\$ 1.60)	Inner Ring £1 (C\$ 1.60)

Source: <http://www.manchester.gov.uk/>

Exemptions and discounts

- Motorcycles
- Licensed Hackney carriages and private hire taxis
- Disabled drivers
- Emergency vehicles
- Buses and community transport vehicles
- Breakdown recovery vehicles
- Minimum wage employees (20% discount for a 2 year period)
- Patients attending hospital within the M60

Payment of the charge would be via a pre-pay GPS "tag and beacon" system. Credit would automatically be deducted from a driver's account as they passed through a cordon. Occasional visitors to Manchester without a pre-pay tag would be able to pay via the call centre or internet, although there would be a surcharge for this. The scheme would only be operational when 80% of the public transport improvements had been completed.

Revenue Impacts

Revenue yields are not available as the scheme was not implemented. However, the scheme was designed to pay back £1.15 billion (C\$ 1.83 billion) secured in loans against the charge, with revenue from the charging scheme over a 30-year period.

Behavioural Impacts

Based on a scheme implementation in 2013, car numbers during peak times inside the charging rings were predicted to drop by 10 to 15 percent.

Governance

In July 2004, the Government announced the Transport Innovation Fund (TIFUK) as a funding mechanism whereby local council authorities could bid for funds for their own package of transport schemes. The Government was looking for transport packages that combined demand management with a coherent anti-congestion strategy, most likely through area wide road pricing.

The Greater Manchester Passenger Transport Authority (GMPTA) and Association of Greater Manchester Authorities (AGMA) developed the Greater Manchester TIFUK, a package of public transport improvements with a road pricing scheme to secure £3 billion (C\$ 4.8 billion) of funding. The GMPTA was responsible for co-ordinating public transport in the region, whilst the AGMA represented ten district councils in Greater Manchester. As part of the scheme, a significant upfront investment of £1.44 billion (C\$ 2.29 billion) was to be secured in TIFUK grants. Improvements outlined in the proposals included²:

- 30km extension of the Manchester Metrolink (light rail system)
- New 21km dedicated busway, new bus priority lanes, more buses and high-quality express services for commuters
- New transport interchanges for the Regional Centre, Altrincham, Rochdale, Stockport and Bolton and a new transport hub in Wigan
- A new fare and ticketing system (smartcard), real time information and improved passenger facilities
- New yellow school buses
- Longer trains and a range of station and platform improvements
- Local and strategic Park and Ride sites at existing rail and Metrolink stations

In developing the Greater Manchester TIFUK proposal, the general public were consulted extensively. The proposal was agreed by the AGMA (with the support of 8 councils, although one later withdrew its support) and submitted in July 2007. In June 2008, the government approved Greater Manchester’s TIFUK bid and a 14 week consultation on the proposal began in July. During this period, it was decided by Manchester City Council to hold a referendum on the proposal by postal ballot.

In the lead up to the referendum, surveys suggested that approximately two thirds of the public were against the congestion charge. Three pressure groups formed trying to influence the outcome of the referendum: Manchester Against Road Tolls and the Greater Manchester Momentum Group both opposed the charge. United City supported it. In the press, the congestion charge received a lot of negative reaction, which snowballed during the referendum. This was exacerbated, particularly as fundamental details on expected passenger numbers, traffic reduction forecasts and revenue flows, the very details which might indicate whether the scheme was sustainable and likely to have a positive impact on traffic and economy, were not released.

The results of the referendum were broken down by local authority area and for the TIFUK package to go ahead to the next stage at least 7 out of 10 councils needed to support it. In the end, councils in each area rejected the proposals. The results were discussed at the next AGMA meeting and the proposal was officially dropped.

Table 4: Results of the Referendum

District	Turnout	Yes	No	% Yes	% No
Bolton	48.8	20,529	76,910	21.1	78.9
Bury	57.4	16,563	64,001	20.6	79.4
Manchester	46.1	43,593	113,064	27.8	72.2
Oldham	54.4	17,571	68,884	20.3	79.7
Rochdale	50.8	17,333	61,686	21.9	78.1
Salford	57.0	14,603	79,326	15.5	84.5
Stockport	59.0	24,090	103,706	18.9	81.1
Tameside	60.7	16,323	83,105	16.4	83.6
Trafford	63.6	20,445	83,568	19.7	80.3
Wigan	45.3	27,810	78,565	26.1	73.9
All	51.7	218,860	812,815	21.2	78.8

Sources: http://menmedia.co.uk/manchestereveningnews/news/s/1085031_ccharge_a_resounding_no
http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/25_05_07_manchesterroads.pdf

Failure of the bid possibly came down to a lack of commitment to road pricing among Manchester's leadership. It appeared that the motivation for pursuing the policy had less to do with tackling traffic congestion in the city centre or even reducing car use, than it did with leveraging funding from a central government source in order to help pay for other transportation projects. Originally, regional leaders had not planned to hold a referendum on the TIFUK proposals; but after they failed to get agreement on the package among local authorities in Greater Manchester, they were backed into it. This lack of commitment to both the concept of road pricing and a public referendum on the issue may have doomed it from the start.

Implications for Building Public Acceptance

In January 2009, work began to salvage the TIFUK and by May 2009 the ten local councils had agreed on a new funding proposal which ranked the individual TIFUK proposals along with several other existing local transport proposals by need. Three budgets proposals were developed combining funds from local councils, existing transport budgets (20%/40%/60%) with an increase in council tax (3%) and a loan supplemented with funds from the national government not conditional on the congestion charge. The midsize budget was selected to allow £1.2 billion (C\$ 1.9 billion) to be raised for spending on the Metrolink extension and various road and bus improvements. The proposed congestion charge, travel card system, increased trains and most of the station improvements were dropped.

Congestion charging generally attracts majority opposition before its introduction, but majority support after implementation as people can see the benefits. The Manchester scheme was in this position but unlike other schemes implemented, did not have the benefit of a trial to change public opinion or a change in law to introduce the scheme without a referendum. An important lesson is the need to build public acceptance prior to the proposal.

In Stockholm, public attitude towards the charge before a 6-month trial in 2005 was broadly negative (55%), but swung to marginally positive after the trial (2006), with only 42% against the charge. In 2007, following permanent implementation of the charge, negative public opinion had fallen further still with only 28% against the charge and 67% in favour.

In London, a change in law enabled the future mayor to introduce 'road user charging' without holding a referendum and plans were included in the Mayor's Transport Strategy. The mayor exercised these powers and implemented the charge as promised following consultations with interested parties. Prior to the launch of the scheme, press coverage was largely negative. Out of 730 articles on congestion charging that appeared in the print media between October and November 2002, 50% were negative and only 18% positive, with 32% considered neutral. Surveys completed to track changes in public attitudes towards the charging scheme showed a noticeable shift in opinions after charging was introduced. The incidence of positive attitudes improved from between 30% to 40% before implementation to 48% to 59% afterwards, with negative attitudes declining (40% to 43% before; 24 to 31% after). Important lessons from the implementation of the London congestion charge, which Manchester did not benefit from, included the presence of a strong political champion for the scheme and the nurturing of support from the business community.

References

¹ www.centreforcities.org/assets/files/Congestion%20Charging.pdf

² http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/25_05_07_manchesterroads.pdf

8. Heavy Goods Vehicle Tolling (Germany)

Introduction

Geographically located at the heart of Europe, Germany is a central hub of international truck traffic. As much as 35% of truck miles travelled on Germany's motorways is generated by foreign trucks. Rapid growth in the volume of freight transport has placed a tremendous burden on German motorways. As a result, the German Government who is responsible for maintaining the national transport network (motorways and federal highways) increased its investments in maintenance and expansion. Historically, Germany financed the construction and maintenance of the motorway network through general taxation. In 2005, the German Government introduced a distance-based toll for all trucks of twelve tonnes gross vehicle weight and above, in order to recover a fair share of the costs of maintaining the road network from freight users originating from inside and outside Germany.

The main objective of the truck toll was to provide funds for investment in the national road network (Federal Truck Road Toll Act).

Secondary objectives included:

- Creating an incentive for an ecologically desirable shift towards rail and waterway-based freight transport and more efficient use of HGVs (fewer empties) and the transport network
- Emission related tolls to protect the environment
- Application of the 'user pays' principle (a "40-tonner" places around 600,000 times more strain on the road surface than a passenger car)

The introduction of the truck toll has led some politicians to suggest extending the toll to automobile users at least in part as a replacement for fuel taxes. The Federal Government has always denied such claims, not least because it is fiercely opposed by the ADAC (German Automobile Association), Germany's largest and one of the most influential special interests groups, which represents around 14 million motorists. Most voters (and motorists) fear that a new road user charge would be levied on top of the existing vehicle and gasoline taxes, thus substantially increasing the price of individual mobility. A commitment by the main political parties to reduce these specific taxes in return for distance based charging of automobile users may not be credible in the current economic climate. However, the prospect of extending the scope of the toll to include automobiles cannot be discarded entirely.

Revenue Potential

The toll is levied for all motor vehicles or vehicle combinations with a gross weight of 12 tonnes or more using German motorways, whether they are full or empty – irrespective of their country of origin (Gross maximum weight that a particular vehicle can safely and reliably carry, including all passengers, cargo and equipment in the tow vehicle.) In 2007, the scheme was extended to include some non-motorway trunk roads (federal highway) in Germany to prevent what was seen as toll avoidance by some truck drivers:

- B 75 between the A 253 motorway and the A 7 motorway (Hamburg),
- B 4 north of the A 23 motorway to Bad Bramstedt (Schleswig-Holstein and Hamburg),
- B 9 between the German/French border and the Kandel-Süd junction with the A65 motorway (Rheinland-Pfalz).

The toll is a public sector levy and is not subject to Value Added Tax. The toll amount is based on the emission class, number of axles and distance travelled (calculated by an GPS computerized on-board units).

The Federal Trunk Road Toll Act assigns each vehicle to one of four categories, A to D, based on its emission class. The toll rates mean that trucks with the latest-generation exhaust systems and those that have been upgraded with particle reduction systems pay significantly less than high-emission vehicles. Lift and suspended axles are always taken into account, regardless of whether a vehicle axle is used or lifted (i.e. without road contact) during transport.

In 2007 the toll rate was increased, partly to fund a financial package of incentives to encourage German truckers to convert their fleet to lower emission vehicles. The part of the toll increase to fund the package of reimbursement was only active for 12 months after which time it was removed. The toll rate was subsequently adjusted in January 2009, to provide additional revenue for transport investment, to provide relief for low emission vehicles and to reflect actual infrastructure costs.

Table 5: Toll rates per kilometre from 1 January 2009

Category A	S5, EEV class 1	<= 3 axles	€ 0.141 (C\$ 0.19)
		> 3 axles	€ 0.155 (C\$ 0.21)
Category B	S4, S3 with PMK 2, 3 or 4	<= 3 axles	€ 0.169 (C\$ 0.23)
		> 3 axles	€ 0.183 (C\$ 0.25)
Category C	S3 without PMK, S2 with PMK 1, 2, 3 or 4	<= 3 axles	€ 0.190 (C\$ 0.26)
		> 3 axles	€ 0.204 (C\$ 0.28)
Category D	S2 without PMK, S1 and vehicles not assigned to an emissions class	<= 3 axles	€ 0.274 (C\$ 0.38)
		> 3 axles	€ 0.288 (C\$ 0.40)

Source: Toll Collect

http://www.toll-collect.de/mautsystem/tcrdifr002012_schadstoffklassen.jsp;jsessionid=205D597BEC81FB01F9B23559E79377D9.app02

Certain vehicles are exempt from the toll:

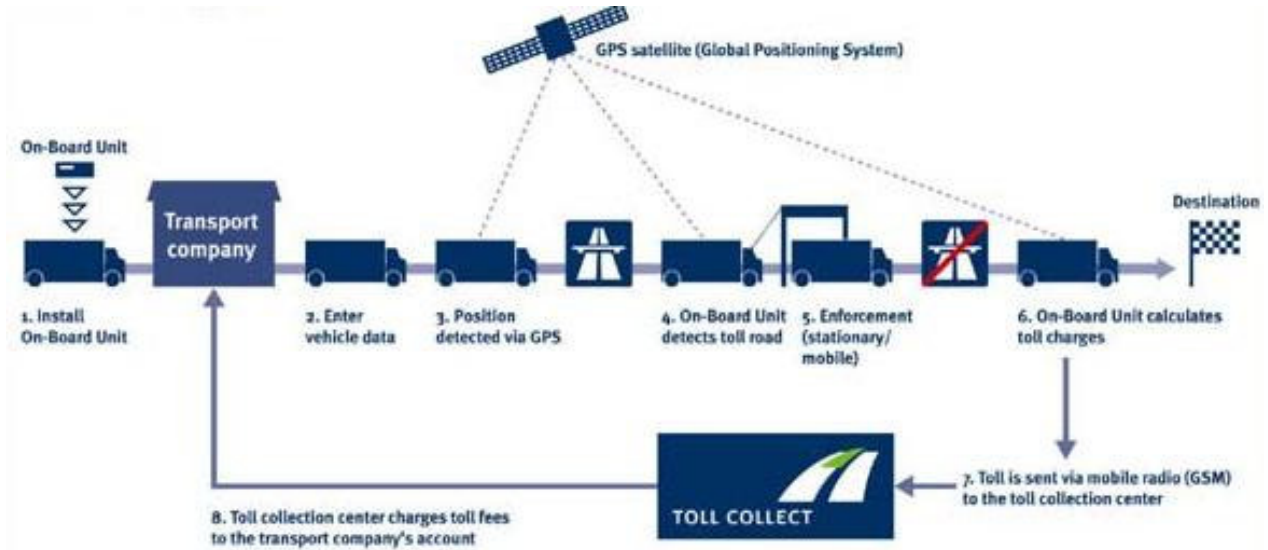
- Buses and coaches
- Military vehicles
- Emergency vehicles
- Civil defence and emergency rescue vehicles
- Vehicles used by a non-profit-making or charitable organisations to transport emergency aid in serious humanitarian crises
- Vehicles in the service of the German Government
- Vehicles used exclusively for highway maintenance and operation
- Vehicles used exclusively for purposes of the circus industry
- Vehicles not intended exclusively for the transport of goods, nor used for this purpose

The toll collection system does not require vehicles to slow down and works via two methods: automated collection covering 90% of the trips and the remaining 10% covered through manual transactions.

Automated Collection System

To take advantage of the automated system, truck companies must pre-register with the Toll company to receive an On-Board Unit (OBU) that is then fitted to each truck registered to the Toll company. Once installed, servicing the OBU is the responsibility of the user. The overall capture rate for the automatic system reached 99.86% during 2010/11.

Figure 15: Truck Toll Collection – Automatic log-on



Source: Toll Collect

[http://www.toll-](http://www.toll-collect.de/frontend/press/picturearchive/BigPictureVP.do;jsessionid=205D597BEC81FB01F9B23559E79377D9.app02?primaryKey=515)

[collect.de/frontend/press/picturearchive/BigPictureVP.do;jsessionid=205D597BEC81FB01F9B23559E79377D9.app02?primaryKey=515](http://www.toll-collect.de/frontend/press/picturearchive/BigPictureVP.do;jsessionid=205D597BEC81FB01F9B23559E79377D9.app02?primaryKey=515)

Manual Collection

This is primarily for truck drivers and transport companies that seldom use German motorways. The user logs-on for the planned route at one of about 3,500 toll station terminals or over the Internet (requires registration).

Figure 16: Truck Toll Collection – Manual booking (on the internet or at toll station terminal)



Source: Toll Collect

[http://www.toll-](http://www.toll-collect.de/frontend/press/picturearchive/BigPictureVP.do;jsessionid=205D597BEC81FB01F9B23559E79377D9.app02?primaryKey=515)

[collect.de/frontend/press/picturearchive/BigPictureVP.do;jsessionid=205D597BEC81FB01F9B23559E79377D9.app02?primaryKey=515](http://www.toll-collect.de/frontend/press/picturearchive/BigPictureVP.do;jsessionid=205D597BEC81FB01F9B23559E79377D9.app02?primaryKey=515)

Revenue Impacts

The total Gross Revenues (to the German Government) since implementation of the system have increased year on year. The significant year on year increase in 2009 is as a result of an increase to the toll rate charges.¹

2005	€ 2.86 billion (C\$ 3.94 billion)
2006	€ 3.08 billion (C\$ 4.25 billion)
2007	€ 3.36 billion (C\$ 4.63 billion)
2008	€ 3.46 billion (C\$ 4.77 billion)
2009	€ 4.40 billion (C\$ 6.07 billion)
2010	€ 4.48 billion (C\$ 6.18 billion)

The toll was initially designed to capture revenues to cover life-cycle infrastructure costs due to heavy vehicle use of roadways. However, shortly before the launch of the scheme, the German parliament legislated that 50% of the net revenues were to be allocated to road infrastructure, 38% to rail and 12% to waterways, which fuelled some resentment and scepticism among trucking interests.² However, the new Federal Trunk Road Toll Act of July 2011 no longer divides net revenue between the three modes. According to section 11 of the Act, all net revenue from the HGV toll is dedicated to the federal trunk roads sector.

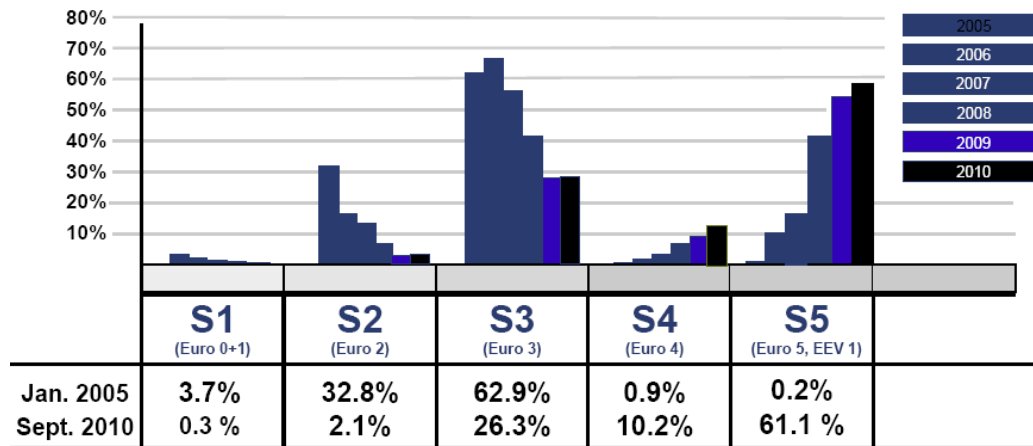
The toll is designed to capture revenues aligned with the infrastructure life-cycle costs required to maintain roadways for heavy vehicle use. However, political decisions to divert existing funds from transportation in order to address other budget shortfalls contradicted commitments to use road-pricing revenues to support infrastructure investment, fuelling resentment and scepticism from trucking interests³. According to the Federal Trunk Road Toll Act of July 2011, the toll revenue less operating costs is earmarked entirely to the improvement of transportation infrastructure for federal truck roads.

Behavioural Impacts

The truck toll has led to the following changes in behaviour in the goods movement sector:

- More loaded truck runs. In 2010, the number of loaded runs increased by 2.1% to a total of 82.1% since 2005 levels⁴
- Fewer empty runs. By 2010, there was an 11% reduction in the number of empty runs relative to 2005⁴
- A mode shift from road to rail freight, based on a 7% increase in containers transported by rail in 2010 relative to container traffic in 2005, prior to the introduction of the toll⁴
- The purchase of trucks with lower emission rates, as indicated in the Figure below, which shows an increase in the proportion of 'greener' vehicles on the road network following introduction of the toll (decrease in S2-type and S3-type vehicles; and an increase in S4-type and S5-type vehicles)⁶
- However, all of the above impacts should be interpreted with caution, because these impacts do not control for other factors (i.e. changes in transportation costs other than the HGV toll or changes in macroeconomic conditions) which may have influenced the impacts.

Figure 17: Kilometres driven by toll-liable trucks in the emission categories S1 – S5



Source: <http://www.its-uk.org.uk/filelibrary/file/Trevor%20Platt%209-12-10.pdf>

Impact on Consumer Prices

Higher transport costs are generally passed on to consumers. Even if the costs are passed on in full, the toll-related price increases represent in almost all cases less than a 0.15% increase in prices, since transportation costs only account for only a very small share of final goods prices.⁵

Negative Impacts

When the scheme was introduced, there was a shift in some traffic from the tolled motorways onto un-tolled roads (although this has been addressed to some extent by changes to the system to cover approximately 1,000km of national highway network).

Implementation and Administration

From September 2011, an agreement began where OBUs installed in vehicles could be used to pay truck charges in Austria, whilst maintaining separate contracts with the toll operators in the two countries. Interoperability has been established between a micro-wave based and a satellite supported toll system, which represents a further step towards an integrated, transnational, cross system toll service.

Toll enforcement and the punishment of violations are the responsibility of a government office, Federal Office for Goods Transport (BAG). A private company provides and maintains the technology required for enforcement. Enforcement is divided into two forms:

- Automated – fixed control bridges use infrared sensors to track approaching trucks. This data is evaluated and compared to the data stored in a database. At the same time, data on suspected toll violators can be sent to BAGS officers at a nearby parking location who can pull the vehicle over and inspect it.
- Mobile – around 300 teams (540 BAG officers) are deployed 24/7 to supplement the control bridges to check for toll violators. Only trucks that have not properly logged on can be stopped by BAG. In addition to these controls, BAG also carries out random inspections of shippers and transport companies (in Germany) with a violation rate less than 2%.

Where evidence of non-payment or incomplete payment is established, the amount of toll due for the travelled route will be retrospectively charged and the defaulting user and company are also liable for the payment of a fine (maximum €20,000 (C\$ 27,500)). Where the actual route cannot be determined, a retrospective charge will be made for a nominal distance of 500 km (312.5 miles).

Governance

The German Government procured the contract for the system from a private consortium as part of a Public Private Partnership (P3). The contractor is responsible for the supply, maintenance, operation and finance of the system over a defined period (12 years). All toll revenues are dedicated to investment in road infrastructure, but the PPP agreement guarantees the contractor a 20% share of the revenues⁶.

The Government approved the introduction of the toll in 2001 (with a change in law) and initially set a deadline of August 2003 for completion of the system, with severe financial penalties incorporated for any delays. A one year timeframe to build such an extensive and complex system was not realistic and several delays in the system development led to a cancellation of the contract. A renegotiation of the contract with more realistic timelines and financial penalties was agreed between the German government and the consortium (who took a 5% cut in fees). A financial penalty of €780million (C\$ 1.08bn) was agreed if the 1st phase deadline was missed, with unlimited penalties if the 2nd phase was missed⁷. To account for the renegotiations in the contract, the consortium carried out an extensive reorganisation of its resources, with the first phase and second phases completed on time. As a result of the delays, the German Government has lost €3bn (C\$ 4.14bn) and recovery of this has been pursued through legal arbitration⁸.

Milestone Dates:

August 2002	Order Year
August 2003	Contract completion date
February 2004	Contract cancelled
March 2004	Contract renegotiated
January 2005	Completion of the 1 st Phase
January 2006	Completion of the 2 nd Phase (Final)

In July 2011, the legislation governing the toll scheme on the motorway network was replaced by a similar act that allowed new rules for the extension of the HGV tolling scheme to include non-motorway federal highways. The new act does not mean that there will be an automatic imposition of tolls for the use of the federal highway by heavy goods vehicles; it just ensures that the technical conditions are in place if the toll is to be extended.

Equity and Distributional Implications

The principle of the toll supports horizontal equity amongst haulage companies as they pay to use the road. The toll applies to all HGVs, regardless of nationality because of the high proportion of freight traffic on the network, which is seen as the most damaging. In that instance, the toll is equal for all HGVs on the network. However, the German Government does provide tax relief to German haulage companies (using funds from the toll) to compensate for the economic impact of the toll on businesses and also provides financial assistance to German truckers to change their fleet to greener vehicles.

Some of the revenues from the scheme are used to fund a financial relief program for German hauliers (€ 450million (C\$ 620 million) per annum) to lessen the impact of the charge and assist with changing fleets to greener vehicles. The German government also provides tax relief to German truckers through a reduction in motor vehicle tax (around €150m/year (C\$ 207/year)).

Overall Economic Efficiency

The impact of the toll is to improve the efficient use of the transport network by HGV users, because there has been an increase in the proportion of loaded runs, a reduction in the number of empty runs and a mode shift to rail.

The distance based toll has also had the effect of better aligning transportation infrastructure cost recovery, including accident, environmental and health costs, with usage of the road network (albeit for freight traffic only). By ensuring that HGV users bear the full costs of goods movement, the tolling scheme ensures that HGV users make more efficient use of the transport network while also minimizing negative externalities. The revenue tool yields a surplus each year to cover operating costs and allow for re-investment in the transport network. The distance based toll also has environmental benefits because it provides incentives to reduce traffic volumes and affect a shift to other more fuel-efficient modes of transport. Furthermore, by including variations in toll rates that take account of different emission rates of vehicles, the toll can promote technical innovations, leading to positive environmental benefits through fleet renewal.⁹

References

¹ <http://www.bmvbs.de/SharedDocs/EN/Artikel/UI/hgv-heavy-goods-vehicle-toll-innovative-ecological-and-fair.html>

² <http://international.fhwa.dot.gov/pubs/roadpricing/roadpricing.pdf>

³ <http://international.fhwa.dot.gov/pubs/roadpricing/roadpricing.pdf>

⁴ <http://www.its-uk.org.uk/filelibrary/file/Trevor%20Platt%209-12-10.pdf>

⁵ <http://www.bmvbs.de/SharedDocs/EN/Artikel/UI/heavy-goods-vehicle-tolls-in-germany.html>. The 7% increase does not control for other factors influencing container traffic by rail.

⁶ https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=serc2009&paper_id=49

⁷ <http://www.roadtraffic-technology.com/projects/lkw-maut/>

⁸ <http://www.transportstyrelsen.se/en/road/Congestion-tax/Congestion-tax-in-stockholm/>

⁹ <http://www.umweltdaten.de/publikationen/fpdf-l/3991.pdf>

9. High Occupancy Toll Lanes (Metropolitan Transit Authority of Harris County (METRO), Houston, Texas)

Introduction

HOT lanes are intended to give drivers without passengers (single-occupant vehicles – SOVs) the option to use an uncongested highway lane in exchange for a toll. This provides a decongestion solution for trips which when drivers deem the time savings from reduced congestion to be sufficiently valuable to justify a toll expenditure. HOT lanes can also have the effect of increasing highway throughput capacity, thereby increase the amount of vehicles travelling on a given corridor without building or expanding existing freeways. HOT lanes can also be considered a further development of the High Occupancy Vehicle (HOV) lane concept, in that single occupant vehicles are allowed access to existing HOV lanes in exchange for a charge when the HOV lane is underutilized at certain times of the day.

Houston METRO is offering the HOT lanes program to:

- Reduce traffic congestion on Houston state highways without additional lanes
- Maximize existing HOV lane use efficiency
- Improve air quality and conserve fuel by reducing cars idling in traffic
- Preserve (and improve) the current level of service to improve bus journey time reliability (by maintaining an average minimum speed of 50 mph)
- Offer increased enforcement of the HOV lane system
- Generate toll revenues to contribute to operating and enforcement costs (with future possibilities to fund transit expansion)

In 2011, METRO authorised a plan to convert 83 miles of HOV lanes into HOT lanes on five of its existing HOV corridors:

- US59 South – April 2012
- I45 North – July 2012
- US290 – October 2012
- I45 South – December 2012
- US59 North – January 2013

Revenue Potential

This case study reviews the proposed conversion of 83 miles (133 km) of existing HOV lanes to METRO HOT lanes on five corridors along Houston's freeways. The METRO HOT lanes will allow drivers without passengers (single-occupant vehicles – SOVs) to use the HOV lane for a toll. A simple pricing system will be used (a single toll per HOT lane, varied by time of day) to maintain free flow conditions with a declaration lane on the approach to the HOT lane to differentiate between toll and non-tolled drivers. The METRO HOT lanes network has the following features:

Figure 18: Houston Metro Proposed Hot Lane Network



Source: METRO (Metropolitan Transit Authority of Harris County, Houston)
<http://www.ridemetro.org/CurrentProjects/HOTLanes.aspx>

- Reversible lane in median with barrier separation
- Hours of operation vary by corridor (usually peak hours)
- Toll price posted in advance – varies by time of day
- 2+ vehicles, motorcycles, buses and emergency vehicles are able to use the HOT lanes for free
- SOVs permitted by paying a toll with an authorised toll tag
- Automatic toll collection
- Camera monitoring system
- Enforcement monitoring booths at entry / exits
- Traffic flow monitoring systems to control the level of congestion – to maintain a certain level of service and consistent travel times.

- No cash payments allowed; Toll tags only. Drivers without passengers will be allowed to use the system by paying a toll using an authorised toll tag such as the METRO HOT Lanes transponder toll tag (available from METRO website or store).
- Users must open a tag account with a one-off initial set-up cost of \$15 (C\$ 15.5) for the tag. A minimum amount of \$40 (C\$ 41) must be applied to the tag upon purchase.
- There is potential for interoperability between systems as METRO is working with the Harris County Toll Road Authority (HCTRA), who operates and maintains the toll road network in the wider Houston area (Harris County), on an agreement that will allow motorists to use their EZ Tag or other area toll road tags on the METRO HOT Lanes system.
- Drivers without passengers are able to enter the HOT lanes via existing HOV entrance points but must have a toll tag. At verification points, the lane will briefly become two lanes and drivers must declare whether they have passengers or not by moving to the appropriate lane. Verification will be captured by a transponder signal so vehicles will be able to maintain their speed, with cameras and METRO police enforcing any violation.
- Signs at the entrance points will post the set price to use the HOT lane for single drivers. The toll pricing is not dynamic but a one-off charge to enter the HOT lane will be set in advance by METRO, varying at different times of the day to maintain free-flow speed in the HOT lane.

Proposed HOT Lanes Toll Pricing – I45 South

Operation: Monday to Friday

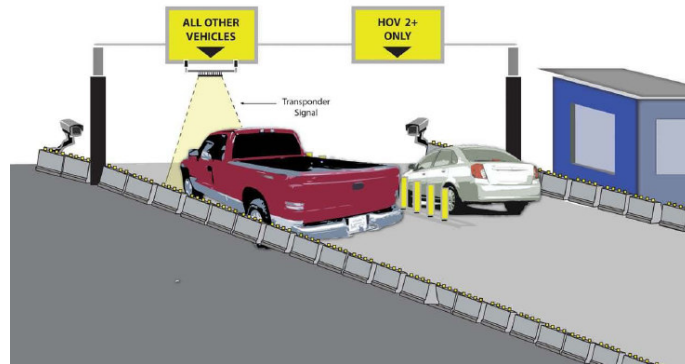
Inbound	Outbound
5am \$2.25 (C\$ 2.3)	1pm \$1.00 (C\$ 1)
6am \$4.50 (C\$ 4.7)	2pm \$2.25 (C\$ 2.3)
7am HOV only	3pm \$4.50 (C\$ 4.7)
8am \$4.50 (C\$ 4.7)	4pm HOV only
9am \$2.25 (C\$ 2.3)	5pm HOV only
10am \$1.00 (C\$ 1)	6pm \$4.50 (C\$ 4.7)
11am Closed	7pm \$2.25 (C\$ 2.3)
12pm Closed	8pm Closed

Source: METRO

<http://www.ridemetro.org/CurrentProjects/HOTLanes.aspx>

http://ntl.bts.gov/lib/jpodocs/repts_te/13668_files/chapter_1.htm

Figure 19: How HOT Lanes Work



Revenue Impacts

The authority has been awarded federal stimulus funds to cover much of the estimated \$50 million (C\$ 51.5 million) capital cost of the HOT Lane conversion. Forecasts suggest 18,000 toll paying customers as a weekday average across all five corridors in the first year. Metro’s budget for FY2012 includes a projected \$1 million (C\$ 1.03 million) estimate for toll revenues from the project. A private contractor is responsible for the system design, equipment supply and installation, and five-year maintenance contract.

The dynamic HOT lane scheme in Florida, I95, which was completed at a capital cost of \$139 million in April 2010, reported annual revenues of \$9.07 million in 2009/10¹.

Behavioural Impacts

The HOT Lanes project is planned for implementation in early 2012 through to 2013 so it is difficult to identify the impacts from the project. However, it is readily understood that HOT lanes have the potential to afford a variety of benefits to both motorists and transit users. HOT lanes provide an important management tool with the potential to improve travel conditions for a meaningful segment of the driving public with a range of potential benefits²:

- **Travel Time Reliability:** Traffic volumes on HOT lanes are managed to ensure superior, consistent, and reliable travel times, particularly during peak travel periods.
- **Travel Time Savings:** HOT lanes allow HOV and paying non-HOV motorists to travel at higher speeds than vehicles on congested general-purpose lanes.
- **Enhanced Corridor Mobility:** Improved trip time reliability, higher speeds, travel time savings, and possible transit improvements all lead to greater mobility at the corridor level.
- **Environmental Advantages:** Compared to general-purpose lanes, HOT lanes may provide environmental advantages by eliminating greenhouse gases caused by stop-and-go traffic, and by encouraging people to use carpools and mass transit, thereby reducing the number of cars on the road.
- **Utilization of Excess Capacity:** HOT lanes may provide an opportunity to improve the efficiency of existing or newly built HOV lanes by filling “excess capacity” which would not otherwise be used.

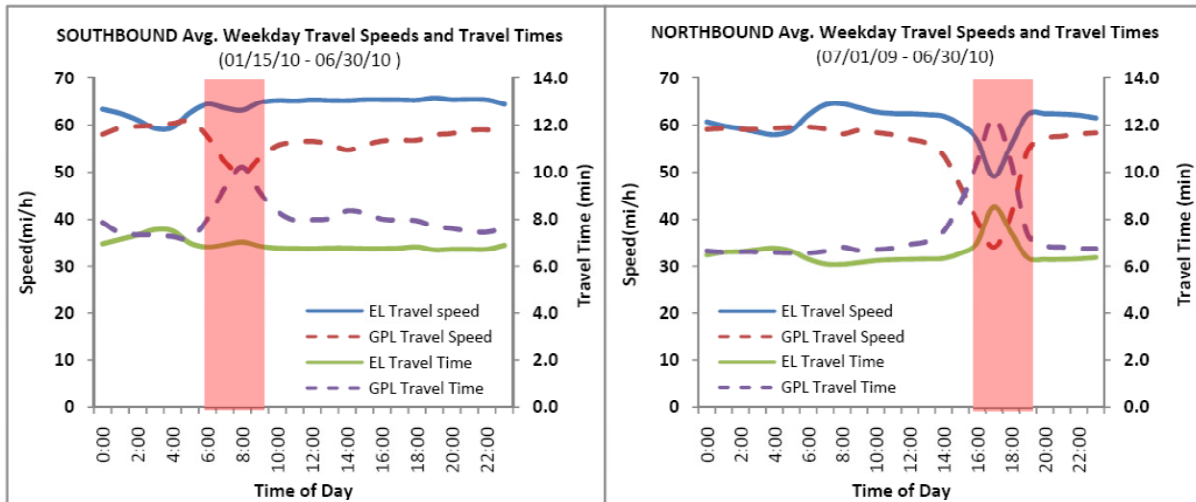
The potential benefits of Houston HOT Lanes are supported by evidence from the I95 HOT Lane scheme in Florida, which reported the following benefits in 2010 compared with 2008 (before the scheme):

Journey time savings and reliability³

- Actual travel times in the northbound HOT lanes decreased from 25 minutes (2008) to 8 minutes (2010)

- Travel speeds during the PM peak period (northbound) in the HOT lanes increased from 18 mph (2008) to 55 mph (2010); during the AM peak (southbound) speeds increased from 20 mph (2008) to 64 mph (2010)
- Vehicle speeds were above the 45 mph threshold 100% of the time in the AM peak (southbound) and 93% of the time in the PM peak (northbound).⁴ The federal requirement is 90%.

Figure 20: Average Travel Speeds and Travel Times for FY 2010



* EL: Express Lanes (HOT Lanes); GPL: General Purpose Lanes

Source: Florida Department of Transportation, District Six, 95 Express Phase 1 Fiscal Year 2010 Annual Report, January 21, 2011
Houston HOT Lane Network, Technical Memorandum #5, Texas Department of Transportation, Houston District

Increase in public transport patronage and reliability³

- Scheduled end to end travel times decreased by 7 minutes (southbound) and 10 minutes (northbound)
- On-time bus service performance increased from 76% (2008) to 81% (2010)
- Average weekday ridership increased 57% between 2008 and 2010
- 53% of new public transport riders along HOT lanes said their decision was influenced by HOT lanes
- 38% of new public transport riders on services along HOT lanes used to drive alone

Decrease in mode share and average vehicle occupancy³

- HOT lanes average vehicle occupancy declined between 2008 and 2010 from 2.20 to 1.36 (AM southbound) and from 1.95 to 1.50 (PM northbound)
- Average vehicle occupancy for the I-95 facility as a whole (Express and General Purpose Lanes) declined from 1.38 to 1.23 (AM southbound) and from 1.50 to 1.37 (PM northbound)
- despite the increased ridership on the 95 Express Bus Service, the public transport mode share in the HOT lanes decreased from 18.6% to 16.1% (AM southbound) and from 15.0% to 14.3% (PM northbound)

This decline in average vehicle occupancy and in public transit mode share on the HOT lanes can both be attributed to the influx of toll paying single occupant vehicles. Public transport ridership increases were more than offset by the larger volumes of toll paying single occupant vehicles. Nevertheless, it should be noted that the bus service did contribute to increased person throughput on the HOT lanes while person throughput from HOV2's and HOV3's decreased.³

Implementation and Administration

Drivers declare themselves at specific METRO HOT Lanes verification points along the corridor, where the lane briefly becomes two lanes and drivers must move to the appropriate lane (HOV 2+ or All Other Vehicles) and pass through. A comprehensive monitoring system to include Electronic Toll Collection, Automatic Number Plate Recognition, Automated Reversible Gate Operation and surveillance cameras will be in operation and used to capture toll violators and enforce the toll. Booths are located along the lane for active monitoring by enforcement officers to ensure single occupant motorists declare themselves to be METRO HOT Lanes users, whilst METRO Police will patrol the lanes to ticket single occupant violators.

An \$11 (C\$ 11.4) administration fee plus the outstanding toll will be issued to the registered owner of the violating vehicle for each toll violation incident. In lieu of administrative fees, customers have the option of opening a METRO HOT Lanes Toll Tag account and paying past tolls due.

If a single driver uses a HOV verification lane instead of all other vehicles lane, then it is considered a toll violation and METRO Police will issue a violation notice. As an option to avoid automatically sending violators to court, violators will be allowed to pay a \$75 (C\$ 77.5) administrative fee rather than the maximum court fine of \$250 (C\$ 258). However, if a SOV uses the METRO HOT Lanes when they are designated for HOV use only (closed to SOVs), it is considered an occupancy violation and METRO will issue a citation and court appearance. The current fine assessed by the court is \$170 (C\$ 176), although they can choose to set the maximum fine \$250 (C\$ 258).

The current HOV violation enforcement procedure could be applied to the future HOT operation, as on other similar HOT projects. However there are a number of concerns associated with the current HOV violation enforcement process:

- HOV violation fines do not represent a source of revenue
- Poor compliance with fines – 21% paid; 34% pending; 45% went to court (98% dismissed or not guilty)⁵

Utilizing toll revenue for enforcement should be a fundamental element of any operating agreement. The cost of enforcement should also be recovered through fines and administrative fees for failure to pay a toll. Effective enforcement involves a continuum of elements including presence of law enforcement, public education penalties that serve as a deterrence and simple enforcement operations (i.e. single toll).

Governance

In the early 1980s in Houston, HOV lanes were built to reduce congestion on transport corridors by providing an incentive for people to carpool and use public transport. Access rules changed several times over the years with the minimum HOV2 requirement changed to minimum HOV3 in 1988 due to high levels of congestion on the facility. After HOV3 was implemented, the raised occupancy restrictions resulted in the HOV lane being underutilized during peak hours. In 2000, Houston's QuickRide program was introduced on the facility to allow HOV2 vehicles access (for a fee) to the HOV3 lane without overwhelming the system to improve efficiency of the lanes. In 2006, METRO announced HOT lane projects were being developed to allow solo drivers to use the HOV lanes by paying a toll. In 2007, the Federal Transit Administration published its policy on HOV to HOT conversions. In 2011, METRO authorised a plan to convert 83 miles of HOV lanes into HOT lanes, on five of its existing HOV corridors. HOT lanes are operated by METRO in agreement with the Texas Department of Transport and remain a non-profit public asset.

Equity and Distributional Implications

Analysis of the previous QuickRide project raised some equity concerns about the ability or interest of low-income individuals to enrol in the program. Although no drivers were worse off as a result of the program and once enrolled it was a benefit to most drivers, income was a significant indicator of whether an individual enrolled in the program. This raises some equity concerns that lower income drivers are less likely to sign up to pay to use the new lanes.

Overall Economic Efficiency

The evidence suggests that HOT lane projects can deliver substantial net positive efficiency gains after taking into account the additional project capital and operating costs. This is because HOT lanes contribute to a more efficient use of the transport network by improving the efficiency of often underutilised HOV facilities. The I95 scheme in Florida has shown the benefits of HOT Lanes with improved public transport services as a result of improved journey time and travel conditions on the freeway whilst increasing vehicle throughput during peak periods.

Evidence from several implemented projects suggests that HOT Lanes can generate overall economic efficiency gains. Analysis of the Houston QuickRide program found that the incremental benefits of QuickRide exceeded incremental costs for the time period considered. A similar research paper that used the same methodology to examine the benefits and costs of the SR-91 Express Lanes (HOT Lanes) in Los Angeles found similar results. The differences between the benefits and costs were dramatically different for the two projects, indicative of the relative size of the two projects and the number of travellers impacted. On SR-91, tens of thousands of travellers were impacted on a daily basis whereas QuickRide's impact was limited to approximately 400 travellers per day. However, the benefit-cost ratios of the two projects were similar, both between 1.5 and 1.7⁶.

References

¹ <http://www.95express.com/>

² http://ntl.bts.gov/lib/jpodocs/repts_te/13668_files/chapter_1.htm

³ http://www.sunguide.org/sunguide/images/uploads/tmc_reports/2010_Miami_95_Express_UPA_Phase_1_Transit_Evaluation_Report_-_FINAL_Jan_2011.pdf

⁴ http://www.sunguide.org/sunguide/images/uploads/tmc_reports/95X_P1_UPA_Eval_FY_10_Annual_Report_01_21_2011__FINAL_-_Doc_ID4256.00_.pdf

⁵ Houston HOT Lane Network, Technical Memorandum #5, Texas Department of Transportation, Houston District

⁶ http://ascelibrary.org/teo/resource/1/jtpedi/v132/i3/p183_s1?isAuthorized=no

10. Overview of State and Local Sales Taxes for Dedicated Infrastructure Funding

Introduction

Two case studies have been highlighted to show how state or local sales taxes have been used to fund specific infrastructure projects. These are the Georgia Special-Purpose Local-Option Sales Tax (SPLOST) and Los Angeles Metro's Measure R. This overview presents these case studies and concludes with a general overview of the behavioural impacts, equity and distributional implications and overall economic efficiency implications of sales taxes.

Revenue Tool #1: Georgia Special-Purpose Local-Option Sales Tax (SPLOST)

Location: Georgia, United States

Proponent: State of Georgia

The purpose of SPLOST is to fund the capital portion of public infrastructure such as parks, schools, roads, bridges, and other public facilities including courthouses and jails.

Revenue Potential

The state of Georgia currently collects a 4% sales tax. In addition to this, other separate sales taxes may be collected at the county level or by eligible municipalities:

- **Special Purpose Local Option Sales Tax (SPLOST):** this sales tax dates back to 1985 and is normally a one percent county sales tax that is approved by voter referenda and used to fund specific capital outlay projects. The revenue is allocated exclusively to the county where it is collected. Total revenue from this type of local sales tax in Georgia was just over \$1.2 billion in 2009.
- **Local Option Sales Tax (LOST):** this type of local sales tax is also approved by voter referenda and dates back to 1978. Unlike the SPLOST, the LOST is not devoted to a specific capital project but is used instead to reduce local property taxes. Total revenue from this type of local sales tax in Georgia was just over \$1.3 billion in 2009.
- **Homestead-Option Sales Tax (HOST)** is local sales tax levied by counties that do not levy a LOST. It is used primarily to fund the homestead exemption under property taxes. Only two counties (DeKalb and Rockdale) in Georgia currently use a HOST.
- **Educational Local Option Sales Tax (ELOST):** this dates back to 1997 and is a variant of SPLOST – it is intended to fund county and independent school districts, but control of the tax lies at the county level (rather than with school authorities). Total revenue from this type of local sales tax in Georgia was just over \$1.3 billion in 2009.
- **Municipal-Option Sales Tax (MOST):** The City of Atlanta charges a city sales tax of 1% to repair its sewers and storm drains. The original rationale for this tax is that it allows visitors and business people who use the City's water and sewer infrastructure but do not pay City water/sewer bills to contribute to the maintenance and upgrading the water infrastructure. More recently, MOST revenues have also been used to fund MARTA.

The SPLOST can only be levied for specific capital infrastructure projects and cannot be used for maintenance and operations costs. A proposed SPLOST must include a list of the county and municipal projects being funded, the estimated cost of each project and the time period of the SPLOST. If a general obligation debt in the form of bonds is required then details of the principal amount, purpose, issuing local government, applicable rates and annual principal payments must also be specified.

Originally, SPLOST only applied to projects undertaken by county governments. In 2004, eligible municipalities were expanded to those which offer any 3 out of 12 services specified in the law (e.g. fire protection or solid waste management).

Transportation SPLOST (T-SPLOST)

The rationale for T-SPLOST is to raise the necessary revenue to help fund major transportation projects in Georgia under the framework of the Transportation Investment Act (TIA). The July 2012 T-SPLOST referendum proposed a 10-year, 1% statewide local sales tax (applied to all sales including food) of which 75% would go to funding the approved list of transportation projects released by each of Georgia's 12 regions and the remainder would go to county governments to fund transportation projects of their choice. The 1% sales tax was projected to generate \$16 - 19 billion in revenues over 10 years.

The July T-SPLOST referendum was approved by voters in only 3 of the state's 12 regions: Central Savannah River, River Valley and Heart of Georgia. It failed to gain voter approval in the 9 other regions, including the metro Atlanta region.

There were two features of interest in the T-SPLOST process as set out under TIA

- the funds collected in each region were to be spent in the same region
- the regional projects submitted for voter approval in the referendum were selected by elected leaders of local governments who formed Regional Roundtables, resulting in a project list for each region

Some state and federal funding will continue to be available to local counties, but counties located in those regions where voters failed to approve T-SPLOST will have to assume 30% of project funding, while the counties located in the three regions where the referendum passed will assume only 10% of the costs.

One other example of a local sales tax dedicated to transportation funding is the MARTA sales tax described below, which is used to fund the MARTA operating deficit.

Metropolitan Atlanta Rapid Transit Authority (MARTA) Sales Tax

In addition to fare revenue, the Metropolitan Atlanta Rapid Transit Authority (MARTA) is funded by a 1% sales tax in Fulton and DeKalb counties. (MARTA does not receive any funding from the state of Georgia.) Declining sales tax revenue combined with an existing budget shortfall has led to the elimination of numerous bus routes and a reduction in rail service frequency. According to recent economic forecasts, MARTA is projected to lose hundreds of millions in sales tax revenues over the next decade, thereby exacerbating the projected \$1.2 billion budget shortfall over this period. The MARTA sales tax was due to decrease to 0.5% in 2032; however a 15-year extension has been approved to 2047. The MARTA sales tax is not considered a SPLOST

Revenue Impacts

As an example, Hall County has a population of approximately 200,000 people and has a history of approving SPLOST referendums. The revenue generated by the five SPLOST programs approved in the county is as follows:

- SPLOST I (1985-1988): \$25 million for road, street and bridge improvements.
- SPLOST II (1988-1991): \$35 million for detention center, civic center and farmers market.

- SPLOST III (1994-1999): \$78.2 million for courthouse expansion, health department, water and wastewater projects.
- SPLOST IV (1999-2004): \$117.6 million for road, sewer, water, parks, emergency services and municipal projects.
- SPLOST V (2004-2009): \$139.7 million of which \$37.9 million went to road and street improvements.
- SPLOST VI (2009-2015): expected to be \$240 million.

Therefore, over a period of 30 years, SPLOST will have raised over \$635 million. For the SPLOST VI period, this translates into \$40 million per year.

Governance, Implementation and Administration

SPLOST is authorized under the “special districts” provision of the Constitution of the State of Georgia. This allows for the creation of special districts for the provision of local government services, where fees, assessments and taxes may be levied to pay for the costs of these services. Legislation specific to SPLOST is located in the Official Code of Georgia Annotated (OCGA).

SPLOST must be passed by a county commission, which is usually a group of three or more elected officials tasked with administering the county government in local government. However, Georgia is the only US state which permits a sole commissioner to govern individual counties, and this occurs in several counties within the state, most notably in Bartow (part of Metro Atlanta) and Walker (part of Metro Chattanooga). SPLOST is usually passed with the agreement of the city councils within the county, and voted upon in a county-wide referendum, usually held during the next scheduled election.

Under the original law as it applies to county governments, SPLOST expires after a period of five years and must be voted upon again if it is determined that funds are still required via this method.

The Georgia Department of Revenue collects SPLOST levies, as it does with all other state sales taxes. The Department retains 1% of the gross revenue in order to cover its administrative expenses. The remainder of the revenue is allocated to the county or qualified municipalities by either an intergovernmental agreement, or by a population-based formula.

Equity and Distributional Implications

Sales taxes are considered to be regressive because they impose a greater burden on poorer households. Sales taxes generally account for a higher percentage of low-income household budgets. This is particularly the case when sales taxes are applied to essential goods. Regarding T-SPLOST, concerns have arisen regarding the equity impacts of imposing an additional 1% sales tax during the current economic climate, especially in the counties under the jurisdiction of MARTA, which are already subject to the 1% MARTA sales tax. However, these effects may be mitigated through the use of sales tax rebates and tax exemptions on necessities, both of which are used by federal and provincial governments in Canada.

Revenue Tool #2: Measure R

Location: Los Angeles County, California, USA

Proponent: Metro (Los Angeles County Metropolitan Transportation Authority)

Policy Objectives and Motivation of Revenue Tool

The purpose of Measure R is to help finance new transportation projects and programs, as well as accelerating the delivery of those already underway. These projects include rail and bus rapid transit, commuter rail improvements, Metro Rail system improvements, highway projects, and other locally-sponsored transportation improvements.

Revenue Potential

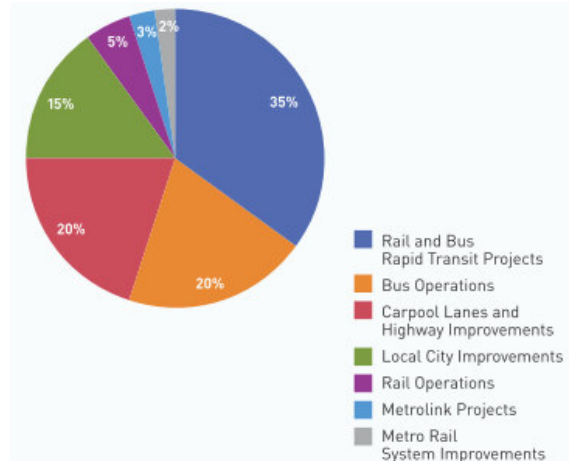
Measure R is a 0.5% sales tax collected by Metro and applied across the Los Angeles County, which has a population of almost 10 million people (the most populous county in the US and more populous than 42 of the US states). The county includes 88 incorporated cities, including the major cities of Los Angeles, Long Beach and Glendale. Measure R is collected in addition to two other transportation sales taxes in Los Angeles County, Proposition A and Proposition C.

Proposition A & Proposition C

Proposition A & Proposition C are also 0.5% transportation taxes, approved in 1980 and 1990 respectively. Prop. A is applied to most retail sales and 25% of the tax is returned to cities in the County for transportation. The balance is allocated 35% for rail development and 40% for discretionary purposes (almost all of which is used to fund bus services). Prop. C revenues are allocated as follows: 20% to the cities for transportation; 40% restricted for the construction and operation of bus transit and rail systems; 5% to expand security; 10% for commuter rail, transit centers, P&R and freeway bus stops; and 25% for transit improvements to freeways and state highways.

The Measure R Expenditure Plan allocates the revenues to seven transportation categories as follows:

Figure 21: Measure R Expenditure Plan Allocation



Source: Metro

Specific projects to be funded broadly fall under five categories (not an exhaustive list – top two projects by category and funding level):

Rail and Rapid Transit Expansion <ul style="list-style-type: none"> Westside Subway Expansion (\$4.07 billion) Eastside Transit Corridor Phase 2 (\$1.27 billion) 	Public Transportation <ul style="list-style-type: none"> Funding allocated for several programs to cities based on population, including improved services for seniors and disabled users
Street Improvements <ul style="list-style-type: none"> Highway 101 Park & Ride (\$2.1 million) Funding allocated for several other programs to cities based on population 	Quality of Life (environmental and noise mitigation) <ul style="list-style-type: none"> Alameda Corridor East Grade Separations Phase II (\$400 million) County-wide Soundwall Construction (\$250 million)
Traffic Reduction <ul style="list-style-type: none"> I-405, I-110, I-105, SR-91 Ramp/Interchange Improvements (\$906 million) SR-710 Project Gap Closure (\$780 million) 	

Revenue Impacts

Measure R does not fully fund all of these transportation projects; the Expenditure Plan details the level of contribution towards specific projects and identifies additional funding sources.

Measure R is expected to raise \$40 billion in new local sales tax revenues over a 30-year period. By the end of June 2010, after its first year of implementation, Measure R has collected over \$551 million in sales tax revenues.

A large proportion of Metro funding is provided from the Proposition A, Proposition C and Measure R local sales taxes. In 2010, these three sales taxes combined to generate over \$1.68 billion in sales tax receipts. The approved Metro budget for FY12 assumes that all sales tax revenue will grow by 2.6% over the FY11 budget. In FY12, Measure R, Proposition A and Proposition C are each projected to raise over \$605 million. Together, these sales taxes will combine to generate over \$1.8 billion, or 40% of Metro's total available resources (\$4.5 billion). Measure R alone will therefore generate approximately 13.5% of the total available resources for FY12.

Figure 22: Measure R Proposed Rail and Rapid Transit Expansion and Proposed Highway Improvements



Source: Metro

Governance, Implementation and Administration

Measure R was put to the Los Angeles County electorate in November 2008 and was approved by voters with a 67% vote. (A two-thirds majority is required by the state of California to raise taxes.) This ballot measure created an ordinance called “Traffic Relief and Rail Expansion Ordinance”. This ordinance included the Expenditure Plan for Measure R, which detailed the level of expenditure required for each of the major projects and programs proposed. The Measure R sales tax was applied as of July 2009.

The sales tax is imposed on all retailers in the incorporated and unincorporated territory of the County on gross receipts of the retailer.

Under the ballot measure, Metro is required to comply with an annual independent audit and report to taxpayers. In addition, the County is subject to ongoing monitoring and a review of spending by a third-party taxpayer oversight committee.

Measure R also limits the administrative costs for collecting the tax revenues to 1.5% annually.

As regards local sales taxes in general, Van der Ploeg (2011) asserts that if local sales tax revenues are geared towards purposes that voters value, then they will support new tax measures. This assumption is supported by evidence which shows that between 2000 and 2010, almost 400 state and local referendums were held in the US (many regarding new sales taxes), and almost 75% of these were passed.

Behavioural Impacts

Behavioural Impacts and Economic distortions

Sales taxes do not have any direct impacts on travel behaviour, other than if they are applied to transit fares and result in increased fares.

More relevant to this case study are the economic distortions which can arise from reliance on sales taxes. These distortions arise from (i) changes in consumer behaviour in response to the tax and (ii) changes in the compliance behavior of retailers and other businesses that remit the tax as they seek to avoid or minimize their tax liabilities.

Changes in consumer behaviour can involve shifting spending to goods and services which are exempt or subject to lower tax rates; shifting the location of purchases to tax-exempt or to lower sales tax states; switching to online purchases (see below) and/or reducing spending on taxed goods and services. The greater the changes in behaviour described above, the higher the efficiency costs from the higher taxes (also known in the public finance literature as “deadweight losses” or “marginal excess burden”). These costs take the form of output (and productivity) losses as well as losses in economic welfare that may not be reflected in output, but are equally important in terms of overall well-being.

In terms of sales tax avoidance, there are many ways that businesses seek to reduce the impact of sales taxes on their operations and their customers, depending on the tax collection rules in place. These include:

- Invoices can be designed to reduce the taxable portion of a transaction (e.g. separating delivery charges from handling or other taxable charges).
- New facilities may be located in jurisdictions with no sales tax or broad exemptions for certain operations thus affecting site selection.
- Businesses operating in several jurisdictions can choose the best delivery location based on their tax liability.
- Reviewing company purchases and keeping proper records to determine tax payment errors or exemptions; some jurisdictions allow refunds up to four years after payment.

One area in which sales tax avoidance has become a key issue is online sales, which has accounted for an increasingly greater proportion of all sales as technology improves and internet use increases. The US Supreme Court has ruled that retailers who have no physical presence in a state can deliver goods to customers in that state without collecting the sales tax.

Equity and Distributional Implications

Sales taxes are considered to be regressive because they impose a greater burden on poorer households. Sales taxes generally account for a higher percentage of low-income household budgets. This is particularly the case when sales taxes are applied to essential goods. In terms of tax burden, the Los Angeles County Economic Development Corporation (LAEDC) estimates that the tax increase will cost each resident of the County an average of \$25 per year. However, these effects may be mitigated through the use of sales tax rebates and tax exemptions on necessities, both of which are used by federal and provincial governments in Canada.

Overall Economic Efficiency

Sales taxes are the most widely used source of dedicated local and regional funding for transit in the US. They have historically provided the highest yield per tax point and until recently were often seen to provide a stable source of revenue. However, recent declines in sales tax revenues during the recession have altered this perspective.

In terms of overall impacts on economic efficiency, an increase in sales tax creates no positive impacts on travel behaviour or improved network performance. Nor does it require any incremental capital or operating costs to collect; or arguably any additional compliance costs on the part of businesses remitting the tax.

However, the biggest advantage of sales taxes is that they tend to create the fewest economic distortions relative to other taxes. A 1997 study by the federal government found that the inefficiency costs per dollar of revenue collected from respective taxes ranged from \$0.17 for sales tax to \$0.27 for payroll taxes, \$0.56 for personal income taxes and \$1.55 for corporate income taxes. A subsequent report by the federal department of finance found a similar ranking in inefficiency costs across different tax tools, but the absolute level of inefficiency costs differed: ranging from \$0.13 in lost welfare per dollar of consumption tax revenue; \$0.15 for payroll taxes; \$0.32 for personal income taxes; \$0.37 for corporate income taxes; through to \$1.30 for sales taxes on capital goods.¹ It is important to note that these estimates are based on taxes applied at the federal and provincial levels in Canada. One would expect similar taxes applied to more circumscribed areas such as the GTHA would have significantly higher inefficiency costs.

References

Georgia SPLOST (various sources):

- <http://it3.ga.gov/Documents/TIA-FactSheet-10-28-2011.pdf>
- <http://www.itsmarta.com/new-economic-forecast.aspx>
- <http://www.gasplost.org/>
- <http://cordeledispatch.com/opinion/x803539975/What-is-a-T-SPLOST>
- <http://www.hallcounty.org/gov/splost.asp>
- <http://www.atlantaga.gov/index.aspx?page=755>
- http://en.wikipedia.org/wiki/Sales_taxes_in_the_United_States#cite_note-69
- <http://www.examiner.com/article/sen-bill-heath-explains-local-option-sales-taxes>

Measure R (from Metro website):

- <http://www.metro.net/projects/measurer>
- <http://www.metro.net/about/financebudget/taxes>
- http://www.metro.net/measureR/images/Measure_R_fact_sheet.pdf
- http://www.metro.net/about_us/finance/images/Adopted_Fiscal_Year_2012_Budget.pdf
- http://www.metro.net/measurer/documents/economic_impact.pdf

Other:

- https://canadawestfoundation.worldsecuresystems.com/pdf-docs/presentations/CVP_March_8_2011_sm.pdf
- http://economics.about.com/od/incometaxestaxcuts/p/sales_tax.htm
- Local and Regional Funding Mechanisms for Public Transportation, Transportation Research Board of the National Academies, 2009
- M. Baylor and L. Beausejour "Taxation and Economic Efficiency: Results from a Canadian CGE Model" Department of Finance Working Paper 2004—10, November 2004.

¹ See M. Baylor and L. Beausejour "Taxation and Economic Efficiency: Results from a Canadian CGE Model" Department of Finance Working Paper 2004—10, November 2004, p.16.

11. Overview of Other Sales and Excise Taxes Dedicated to Transportation Funding (Canada, US)

Introduction

Three case studies have been highlighted to show how other sales and excise taxes have been used to fund infrastructure projects; these are the Motor Vehicle Sales Tax (MVST) in Minnesota, and the Rental Vehicle Tax and Hotel Occupancy Tax in Allegheny County, Pennsylvania. This overview presents these case studies in detail.

Revenue Tool #1: Motor Vehicle Sales Tax

Location: Minnesota

Proponent: State of Minnesota

Policy Objectives and Motivation of Revenue Tool

The MVST was not originally intended to fund transportation projects at its outset in 1967. However, this changed following arguments that the MVST was a highway user tax like a gas tax and the revenue should be treated as such (i.e. dedicated to highways). From 1981, MVST revenues have been used to partly fund transportation and from 2012 all MVST revenues will be utilized as such. MVST has therefore become a key funding source for transportation in Minnesota.

Revenue Potential

The MVST is a 6.5% tax applied to sales of new and used vehicles in Minnesota instead of the general sales tax. However, for certain types of vehicles the tax is a flat rate in lieu of the MVST. For vehicles older than 10 years and with a resale value of less than \$3,000, a tax of \$10 is applied. For collector vehicles, a tax of \$90 is applied.

The use of MVST for transportation was enacted into law in 1981, with a portion of the funding going to highways and transit. This followed many years of debate over the role of MVST since its conception in 1967 and was a recommendation of the legislature's Select Committee on Transportation in 1980. Over the next 11 years, the amount allocated to transportation has changed frequently and in 1992 allocations to transportation ceased. In 2000 and 2001, two separate changes in tax policy led to the re-allocation of MVST revenues to transportation:

- 2000 Legislature: this placed caps on registration taxes for passenger vehicles which reduced the revenue collected – the deficit in highway funds was supplemented by MVST
- 2001 Legislature: this prohibited the use of property tax levies for metro transit operations – MVST therefore replaced this loss in revenue.

The 2003 Legislature increased the percentage of MVST to transit but without an overall increase in the allocation to transportation. This meant that there was a reduction in MVST going towards highways through the Highway User Tax Distribution (HUTD) fund. This was proposed in order to reconcile budget cuts for bus services throughout the state, and to reduce local responsibility for the Hiawatha Line (LRT) operating costs in Minneapolis.

In 2008, a phase-in period began whereby 100% of MVST revenue must be allocated to transportation by FY2012. This began with a 63.75% dedication in FY2008 and has steadily increased since. No more than 60% of the revenue can be allocated to the HUTD fund, and no less than 40% to transit. This was modified in 2009 by shifting additional funding from highways to transit for FY2010 and FY2011, in order to address deficits in transit funding. In FY2012 this ratio will return to the 60/40 split, with 36% of the transit funding going to the metropolitan area and 4% to the remainder of the state. **Table 6** shows the MVST phase-in allocation.

Table 6: MVST Phase-in Allocation

MVST Phase-In Allocation						
	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012+
HUTD fund	30.00%	38.25%	44.25%	47.5%	54.5%	60.00%
County state-aid highway fund	0.65					
Municipal state-aid highway fund	0.17					
Metropolitan transit	21.50	24.00	27.75	31.5	35.25	36.00
Greater Minnesota transit	1.43	1.50	1.75	4.75	4.00	4.00
General fund	46.25	36.25	26.25	16.25	6.25	0.00

Note: Percentage allocations for transit in fiscal years 2010-11 include dollar caps not discussed here.

Source: Research Department of the Minnesota House of Representatives

Revenue Impacts

The additional revenue for transportation is estimated to be \$252 million in FY2012 (the first year where 100% of MVST revenue will go to transportation). This represents a decrease from the 2006 estimate of \$285 million – the reason for this is said to be decreased MVST collections.

Table 7 shows the additional revenue from the MVST phase-in period.

Table 7: MVST Phase-in Additional Revenues

Additional Revenue from MVST Phase-In						
(amounts in millions)						
	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
HUTD Fund	32	54.2	71.8	108.1	152.3	162.8
Metropolitan Transit	17.9	32.1	49.1	70.2	84.3	90.1
Greater Minnesota Transit	1.3	2.2	15.2	13.2	15	16
General fund	-51.3	-88.5	-136.1	-191.5	-251.6	-269.0

Note: Amounts are actual for fiscal years 2008-10 and estimated for subsequent fiscal years based on the Nov. 2010 forecast

Source: Research Department of the Minnesota House of Representatives.

<http://www.house.leg.state.mn.us/hrd/pubs/ss/ssmvst.pdf>

Governance, Implementation and Administration

The MVST is enacted under Minnesota Statute 297B.02. After a prolonged period of adjustments to the allocation for transportation, the 2005 Legislature proposed a constitutional amendment to dedicate all MVST revenue to transportation. This was subsequently approved by voters at the 2006 general election.

MVST revenues are collected by auto dealers at the time of sale or, in the case of private sales, when the vehicle is registered. The additional costs for administering this tax (borne by state) and the costs for complying with the tax (borne by dealers and consumers) are potentially significant. There are no material capital costs associated with implementing this tax.

Other Examples of Motor Vehicle Sales Taxes

In Canada, both new and used vehicles are subject to the broad-based federal and provincial sales taxes. In the US, vehicle sales taxes are dedicated to transportation funding in the following states: CT, IA, KS, MD, MI, MN, MO, NC, NE, OK, SD, VA.

Revenue Tool #2: Rental Vehicle Taxation

Location: Allegheny County, Pennsylvania

Proponent: Allegheny County

Policy Objectives and Motivation of Revenue Tool

The rental vehicle tax (together with the County's alcoholic beverage tax) fully funds the operating subsidy of the Port Authority transit operations and provides a local match sufficient to leverage all state funds available, as well as funding debt service payments related to Port Authority capital projects.

Revenue Potential

The rental vehicle tax was introduced in 2008 and is a \$2 per day (or part of any day) charge applied to vehicle rentals within the County. This includes cars, trucks, vans, trailers or semi-trailers as well as auto sharing services such as Zipcar.

Allegheny County has a population of over 1.2 million, the second most populous county in the state, and contains the Pittsburgh metropolitan area. The rental vehicle tax is applied on top of several other sales taxes:

- 6% state sales tax;
- 2% state vehicle rental tax;
- 1% County Regional Asset District tax; and
- \$2 per day state vehicle rental fee.

Certain exemptions to the tax apply. If a company has less than five vehicles for rental purposes, then it is not deemed to be a rental company and is exempt from the tax. Similarly, if the products to be transported are classed as commercial freight, then the tax is not applied.

Revenue Impacts

The 2012 Comprehensive Fiscal Plan for Allegheny County indicates that the adopted budget for 2011 included \$5.481 million in operating revenue from the rental vehicle tax, while the proposed 2012 figure shows an increase to \$6.169 million.

Governance, Implementation and Administration

In December 2007, council passed *Ordinance No 55-07-OR/3546-07* to amend and supplement the Allegheny County Code of Ordinances, Division 1, "Administrative Code", and created Article 808.B "Rental Vehicle Taxation". This was subsequently approved by the chief executive to take effect in January 2008.

The \$2 daily tax is collected by the rental company at the point of sale and remitted to the County. A monthly return must be completed by the rental companies. This form may be mailed by the tax collector but it is the company's responsibility to obtain the form – it is also available at the tax office, courthouse or online. The form must be submitted even if no tax is due for a specific monthly period and submission should occur within 15 days of the prior month. The monthly return form requires the following information:

- Name and address of rental company;
- Federal employee identification number of rental company;
- Total vehicle rentals and total rental days for that month; and
- Total tax due.

Rental companies are liable for the full amount due if they fail to collect or remit the proper amount. An audit may be requested to verify records kept by the rental company. Penalties are applicable for late payments or violations.

The additional costs for administering this tax (borne by the County) and the costs for complying with the tax (borne by car rental dealers) are significant. There are no material capital costs associated with implementing this tax.

Other Examples of Car Rental Fees

In Canada, municipalities and transit agencies do not have the authority to levy car rental fees. Provincial governments do have such authority, but we do not have any evidence to suggest that they have relied on any such fees (over and above the provincial sales taxes, GST or HST that is usually applicable).

In the US, the first excise tax on a car rental was imposed in Oregon in 1976. Since then, at least 80 car rental taxes were introduced across 39 US states as of 2006, in many cases to fund the construction of sports and cultural facilities. Of the eighty instances, only about 20 were dedicated to specific or general transportation needs.¹ The fees either take the form of an ad valorem tax, usually between 1% and 2% of the value of the rental (which may include other taxes), or a fixed fee per rental day, which typically fall in the range of \$1/day to \$4/day. The fixed fees represent a price increase several times greater in magnitude than the 1-2% ad valorem tax.

Revenue Tool #3: Hotel Occupancy Tax

Location: Allegheny County, Pennsylvania

Proponent: Allegheny County

Policy Objectives and Motivation of Revenue Tool

The purpose of the tax is to raise revenues to fund convention-marketing activities in support of local tourism and business sectors, including transportation requirements to support local tourism. Some states expressly prohibit the use of proceeds from occupancy taxes in order to fund public transportation for the general public (e.g. Texas).

Revenue Potential

The hotel occupancy tax is levied at 7% of the purchase price of a room or other accommodation rented. A room is classified as the entire area rented by an occupant, inter alia for sleeping accommodations. A hotel is classified as an establishment which has sleeping quarters available to the public for periods less than 30 days.

A number of exemptions to the tax exist and these are detailed below:

- Ambassadors, ministers and consular officers of foreign governments;
- Occupancy by the United States government;
- Federal Credit Unions, Pennsylvania Credit Unions, Agricultural and Electric Co-operatives;
- Public Authorities under the Municipal Authorities Act;
- Hospitals, nursing homes, convalescent homes, mental institutions, other care facilities;
- Educational institutions providing accommodation (e.g. university used for a conference); and
- Private club which restricts accommodations to its own employees/members.

In addition, after 30 consecutive days of occupation, a person becomes a “permanent resident” and is thereafter exempt from the tax.

Revenue Impacts

Table 8 shows the revenues generated by the tax over the past ten years. This shows a relatively steady increase in revenues, although they dropped by about 10% from 2008 to 2009, likely due to the impact of the recession. This confirms that hotel fees are likely to be sensitive to the business cycle (i.e. pro-cyclical).

Table 8: Revenues Generated by Hotel Occupancy Tax

Year	Revenue (\$M)
2001	15.9
2002	15.9
2003	15.9
2004	17.1
2005	17.9
2006	20.2
2007	22.7
2008	24.6
2009	22.3
2010	24.6

Source: Allegheny County

The revenues generated provide funding support for a variety of convention-related purposes. This has included a convention center, visitor bureaus, and the sports and exhibition authority.

Governance, Implementation and Administration

All hotel operators are required to submit an Application for Registration to the County Treasurer. This registration should be made within 30 days of commencing business. The application requires the following information:

- Ownership structure;
- Business address;
- Mailing address;
- Room rates; and
- Number of rooms available for transient occupancy.

Hotels with more than 15 rooms remit revenue on monthly basis; if the hotel has less than 15 rooms it is required to remit revenue on a quarterly basis. In both cases, returns are due on the 20th day of the month following the remittance period.

The additional costs for administering this tax (borne by the County) and the costs for complying with the tax (borne by hotel owners) are potentially significant. There are no material capital costs associated with implementing this tax.

Other Examples of Hotel Occupancy Taxes

In Canada, municipalities and transit agencies do not generally have the authority to levy hotel occupancy taxes. Provincial governments do have such authority and supplementary hotel taxes (i.e. over and above provincial sales taxes) are currently levied in British Columbia, Alberta, Quebec, Nova Scotia and Newfoundland.² In the case of British Columbia, the province has authorized the collection of an additional 2% room tax (levied on the value of hotel bills). These funds are collected by the Province and then remitted to individual municipalities, each of which is required to direct the proceeds to specific uses. For example, the City of Vancouver is required to spend the proceeds of the 2% tax in its area on (a) convention centre marketing and other tourism promotion and (b) the

tourism industry's contribution to the expansion of the Vancouver Convention and Exhibition Centre.³ Other BC municipalities in receipt of their hotel occupancy tax funds also appear to be required to direct the proceeds at tourism marketing programs.

It is also worth noting that in 2004 hotel owners in Ottawa, Kingston and Toronto voluntarily introduced a 3% Destination Marketing Fee on the room-only portion of their guest bill. The charge is collected by participating hotels and remitted to the local tourism promotion agency in order to support destination marketing activities. According to the Ontario Tourism Competitiveness Study (2009), "the DMF has had a very positive impact on the industry in areas where it is used. In Ottawa we heard that, since 2004, when the DMF was introduced, hotel occupancy rates have risen with each year as a result of significantly increased marketing."⁴

Behavioural Impacts

Room rental taxes are not expected to have any impact on vehicle usage or related costs in terms of road congestion, even though they may discourage tourism and business trips to the taxed destination. This is also true for the vehicle sales tax and car rental fees, although marginal reductions in vehicle kilometres could materialize in the event of small reductions in demand for either cars or car rentals.

The behavioural effects of these excise taxes will include some unintended (from a policy perspective) effects, which in turn will generate inefficiency costs. To the extent that vehicle sales taxes are passed on to higher vehicle prices, this will tend to reduce the market demand for vehicles, which can take the form of fewer vehicle purchases or delayed purchases.⁵ In fact, delayed purchases could likely lead to older average cars and hence, higher emissions. Car rental fees are also expected to reduce the demand for car rentals, shifting purchases to lower-value rentals, which may well be smaller, lower-emission vehicles. Potentially the most important inefficiency costs are associated with shifting purchases to non-taxed or lower-taxed jurisdictions, which is likely when excise taxes apply to limited urban areas rather than province- or nationwide.

As regards excise taxes which affect tourism and business travel to a region, these taxes could make the taxed region less attractive as a travel destination. This effect may be material for relatively price-sensitive segments of the tourist market, such as the convention business.

None of the three excise types of excise taxes would be expected to have any impact on transportation network performance.

Equity and Distributional Implications

In terms of horizontal equity (i.e. the extent to which those who pay the tax are also the beneficiaries), these excise taxes rate poorly, because the revenue generated is not usually destined to benefit the users in any direct way (some hotel occupancy taxes are an exception). Nor can it be argued that these taxes are designed to recover the full cost of transportation infrastructure usage (including externalities), because hotel room rentals and vehicle purchases are only very loosely related to usage, if at all. There is a somewhat stronger relationship in the case of car rental fees, but the fee does not depend on vehicle kilometres driven. Moreover, other sales taxes already apply to car rentals. Hence, it cannot easily be argued that car rentals generate externalities that users do not take into account when they make their purchase.

In terms of vertical equity (i.e. the extent to which the tax represents a similar share of higher income household budgets as it does for lower income budgets), these taxes appear to rank relatively well, because the goods and services subject to these taxes are not essential goods. Moreover, when the excise taxes take the form of ad valorem taxes (i.e. taxes based on a percent of the sales price), users pay more when they purchase higher end

goods and services. However, there are many instances where fixed-fee charges are applied, in which case users purchasing lower-end hotel room or car rentals pay a higher proportion of their payment in taxes. These fixed fee charges are clearly regressive taxes, although they tend to represent a very small portion of users' overall spending. Vehicle sales taxes are ad valorem taxes and as such are unlikely to be regressive.

There do not appear to be any particular geographic implications for these local excise taxes. Yet, to the extent that these taxes are borne by tourists or business travellers, it would mean that the charge targets users who do not have a say (i.e. a vote) in the same way that residents do.

Overall Economic Efficiency

These three types of excise taxes are likely to entail much higher efficiency costs than broad-based and country- or province-wide consumer sales taxes, because they are typically applied to a narrow consumption base (i.e. to very small parts of overall consumer spending) and often to restricted geographic areas. This means that consumers can easily change their consumption patterns in response to these excise taxes, including the value and types of goods and services purchased as well as the locations where they are purchased. These changes in consumption patterns create inefficiency costs, because they lead consumers to move away from the type, value and location of the goods and services they would have purchased without the taxes. The greater the displacement in consumption patterns, the higher the inefficiency costs.

Compared to a broad-based sales tax, these types of excise taxes provide ample room for consumers to shift their spending to other items or services which are taxed at lower rates. It is these types of changes in behaviour that create the economic distortions and generate inefficiency costs associated with taxation. These inefficiencies are further exacerbated when the tax is imposed on a limited geographic area which allows residents and visitors to avoid the tax by shifting their purchases to the area outside the taxed jurisdiction.

In one egregious example of these inefficiency costs, a \$4/day car rental fee was imposed on the Missouri side of Kansas City which lies in the eastern part of the city, but not in the state of Kansas which covers the western half of the City. According to Gale and Rueben, this fee represented a 14% tax on an average \$30/day rental at the time in 2005 and it led consumers who lived in the zip codes closest to the taxed car rental locations to reduce their demand for rentals by between 41% and 50% and the demand for car rental days by between 69% and 86%.⁶ This dramatic change in behaviour attests to the high level of consumer sensitivity to a relatively high tax rate, applied to a narrow tax base and applied only to one part of a wider urban geographical area.

In terms of the size of the inefficiency effects, we look to the results of one of the seminal papers in this area, whose results have held up well over time (Ballard, Shoven and Whalley, 1985).⁷ According to this paper, the inefficiency costs range from \$0.38 per dollar of revenue generated (when all consumption taxes are considered, including both broad-based and commodity-specific taxes) to \$0.12 per revenue dollar when alcohol, gasoline and tobacco taxes are excluded. With the exception of the MVST, we think the inefficiency costs of these types of taxes would likely be at the high end of the range above (and could well exceed the top end of the range), because they are applied to restricted geographic areas. In addition, we would need to add the costs of administering any excise tax, which are not included in the above estimates and could add up to several cents per revenue dollar.

Of the three taxes, the Minnesota vehicle sales tax is a special case in that the general sales tax for Minnesota has historically been set at the same rate as the MVST, although it diverged slightly as of July 2009 when the state sales tax was raised to 6.875%, but the MVST remained unchanged. This means that there is much less room to avoid the MVST and hence, the adverse behavioural effects arising from the tax are mitigated considerably.

Of particular note is the fact that the MVST applies to both new and used vehicle purchases. This design feature is essential in order to mitigate adverse and unintended changes in consumption patterns.

References

MVST (from the Research Department of the Minnesota House of Representatives):

- <http://www.house.leg.state.mn.us/hrd/pubs/ss/mvst.pdf>
- <http://www.house.leg.state.mn.us/hrd/pubs/mvstrns.pdf>

Rental Vehicle Tax (various sources):

- <http://www.alleghenycounty.us/treasure/rentvehtax.pdf>
- <http://www.autorentalnews.com/News/Story/2010/08/Average-Total-Cost-of-Domestic-Car-Rental-for-Business-Travelers-Remains-Flat-in-June.aspx>
- http://www.pittsburghlive.com/x/pittsburghtrib/news/cityregion/s_547827.html
- http://www.alleghenycounty.us/budget/2012/FiscPlan2012_1.pdf

Hotel Occupancy Tax (from the Allegheny County Treasurer's Office):

- <http://www.alleghenycounty.us/treasure/hotel.aspx>
- <http://www.alleghenycounty.us/treasure/ACHotelRegs.pdf>

General

- "New Tools for New Times: A Sourcebook for the Financing, Funding and Delivery of Urban Infrastructure", Casey Vander Ploeg, Canada West Foundation, 2006.

¹ See Table 3 in William Gale and Kim Rueben "Taken for a Ride: Economic Effects of Car Rental Taxes" (2006), available at http://heartland.org/sites/all/modules/custom/heartland_migration/files/pdfs/19712.pdf

² See "What is the Destination Marketing Fund (DMF)?" in <http://www.hotelassociation.ca/site/news/faq.htm>.

³ See B.C. Reg. 74/2004 at http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/12_74_2004.

⁴ See http://www.mtc.gov.on.ca/en/publications/Discover_Ontario_en.pdf p. 8.

⁵ McCarthy "Market Price and Income Elasticities for New Vehicle Demands" Review of Economics and Statistics 78 (August 1996): 543-47 estimates a price elasticity of demand of just under unity (-0.87) using a multinomial logit model of new vehicle demands with 1989 US nationwide household survey data of new vehicle buyers collected by J.D Power and Associates. This means that a 10% increase in vehicle prices leads to 8.7% drop in market demand for all vehicles. The multinomial logit model used six categories of explanatory variables, including vehicle costs, physical characteristics and vehicle style, quality, manufacturer, consumer search activities and household socio-economic characteristics.

⁶ See Gale and Rueben "Taken for a Ride: The Economic Effects of Car Rental Excise Taxes" (2006), pp. 17-18; downloaded from http://heartland.org/sites/all/modules/custom/heartland_migration/files/pdfs/19712.pdf. These results are based on a regression analysis which controls for other influences on car rental demand. Specifically, "monthly rental behavior in each branch is modelled as a function of indicator variables for: the month of the year (to control for any seasonality in car rentals), the year (to control for economy-wide changes over time), the specific branch (to control for any unique characteristics of a specific branch), and whether the car rental tax applied to the branch in question in the month in question" (p. 17).

⁷ Ballard, Shoven and Whalley "General Equilibrium Computations of the Marginal Welfare Costs of Taxes in the US" American Economic Review, 75 (no.1):

12. Overview of Tax Increment Financing (TIF) (US)

Introduction

Tax Increment Financing (TIF) is a widely used tool in the U.S. TIF began in California in 1952 as a mechanism by which cities could raise money for development to secure funding match for projects. Since then, it has gained popularity and is now permitted in all states (except Arizona which repealed its TIF legislation) as well as in the District of Columbia. There are thousands of TIF districts currently in existence across the U.S.¹ TIFs are much less prevalent in Canada, but have been used recently in Ontario (e.g. Toronto-York-Spadina Subway Extension and the West Don Lands redevelopment project), Manitoba (e.g. for an 11-block section of downtown Winnipeg) and Alberta (e.g. the East Village redevelopment project in Calgary).

TIF can help make development of a marginal site more attractive, entice private sector investment, and provide a catalyst to achieve public policy objectives, including transit oriented development and placemaking. It helps redirects growth and development that would otherwise have gone elsewhere in the region to the TIF.

“TIF is a method to use future gains in taxes to finance current improvements (which theoretically will create the conditions for those future gains). When a development or public project is carried out, there is often an increase in the value of surrounding real estate, and perhaps new investment (new or rehabilitated buildings, for example).”²

TIF is often used as part of a wider package as a gap financing mechanism. However, it should not be considered a new source of funding by jurisdictions that already rely on a property tax base (e.g. municipalities).

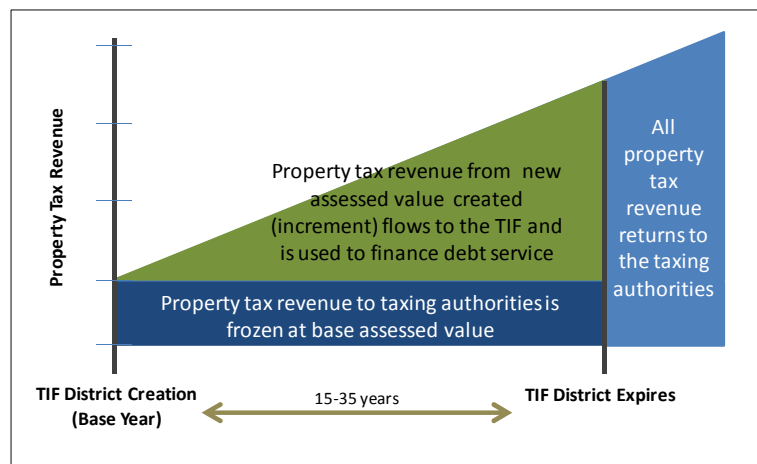
Policy Objectives

The principal purpose of a TIF is to encourage and support development in an area that suffers from blight or economic decline and has obstacles that discourage investment (such as an inadequate street network or lack of other necessary infrastructure) and/or which otherwise would not develop. TIF provides a mechanism to issue bonds and is used in areas in need of investment in public infrastructure improvements, environmental cleanup, or dealing with abandoned or derelict buildings.

Revenue Potential

This section presents three different TIF examples below.

Although the use of TIF varies widely and each state has its own enabling legislation and rules surrounding creation of TIF districts, it is ultimately a process whereby a portion of future tax revenue from a specific area is used to support and promote development within that area. Securing private sector development partner(s) is a crucial component for a successful TIF. Specific TIF district purpose, design, financing structure, and participating entities differ significantly from one TIF district to the next. Some general features and principles are described below.



Revenue Sources and Financing Instruments

- Property Tax – Once a TIF district is created, future annual property tax revenues for the life of the TIF are split between the original taxing jurisdictions and the new TIF district. The existing tax revenue based on the existing assessed value of property (including land, buildings and other tangible fixed assets subject to the property tax) at the time the district is created (i.e. the “base value”) continues to be directed to the original taxing authorities (city, county, school boards, etc.).

The new tax revenue – the increment – is directed to the TIF district. New tax revenue is generated from increased property value arising from the new development and the infrastructure project improvements. “Redevelopment is implemented usually by the private sector, under the auspices of a city board or a community redevelopment agency, which gets the use of the accruing tax revenue.”³

Once the TIF district expires, either because the set time frame has been reached, or because all improvements are made and paid for, the tax revenues return in full to the original taxing jurisdictions.

There is considerable variation among different states as to how this process works. In Massachusetts, for example, an alternate strategy is employed whereby the TIF district signs an agreement with the developer to not charge taxes on all or part of the increased value of a land parcel for a set number of years. In Illinois, all TIF revenue must be spent by the local government in the city of the TIF district, whereas in California, independent redevelopment agencies have been established to manage the TIF district. Some TIFs are required to provide a portion of their revenue to fund city-wide projects such as affordable housing.

- Other Taxes - Most states only include property tax revenues as part of TIF. However, other sources of incremental revenue, such as from sales tax, utility tax and earnings tax, is permitted in some states.⁴

Using the sales tax as an example, if the creation of a TIF district facilitated a significant level of retail development which previously did not exist, then all future sales tax revenues generated within the TIF district would be directed back to the district for the life of the district.

- Revenue Bonds – To facilitate an early start on improvement to support the development in a TIF district, the municipality may issue revenue bonds secured against future tax revenues generated within the TIF District. TIF bonds are sold as a means to provide up-front financing for land acquisition, environmental remediation, and public infrastructure improvements. Over a period of time, the tax revenues generated by development and improvements in the TIF are used to pay off the bonds.
- Complementary Special District Revenue – TIF districts are often used in conjunction with other special districts, such as special assessment districts, transportation districts, community improvement districts and business improvements districts. These are not TIF districts, but can be used to provide additional sources of financing for certain project costs. These districts are typically set up through a vote by residents or property owners within the district boundaries and they can mandate the collection of an additional sales tax, property tax or special assessment. The special district receives all the tax revenue resulting from the newly mandated tax (i.e. there is no “base value” retained by the existing tax jurisdictions).⁵
- Other - TIF districts in the U.S. are often the beneficiaries of federal and state grants and tax incentives. These additional sources of funds provide further support in achieving the objective in the TIF District.⁶

Eligible Costs

- TIF revenue is spent on various types of projects and activities, including operations and maintenance costs, as prescribed by the jurisdiction. Examples of eligible costs are as follows:
 - Professional services (architectural, engineering, planning, legal) such as in preparing studies and plans, including costs associated with district creation.
 - Marketing to prospective businesses, developers and investors.
 - Land acquisition.
 - Site preparation, rehabilitation/removal of existing buildings.
 - Capital projects and improvements (e.g. streets, sidewalks, parks, water and sewer as well as public transit facilities).
 - Financing charges.

Revenue Impacts

Example 1: Flats East Bank, Cleveland, Ohio ⁷

The city of Cleveland, Ohio has used TIF for a number of large scale developments – it currently has 10 TIF districts.

Project Overview

- 30 acre site (2 adjacent sites – 2 separate TIF districts, created in 2005/2006)
- Public/private development
- \$400M mixed use redevelopment plan – including commercial, retail, residential and recreational uses:
 - 550 housing units
 - 270,000 sf of retail
 - 350-400,000 sf office
 - 2,000 parking spaces
 - Park
- \$103M public infrastructure improvements:
 - Roads
 - Utilities
 - Parking
 - Environmental remediation

Financing Package

TIF + Parking Bond Proceeds – to be repaid from tax increment and public parking revenues	\$50,875,000
Infrastructure Bond Proceeds – to be repaid by Northwest Ohio Regional Sewer District	\$8,850,000
Infrastructure Bond Proceeds – to be repaid by the city of Cleveland	\$10,280,000
Cleveland Public power – upfront funding	\$3,400,000
Cleveland Water Department – upfront funding	\$740,000
Clean Ohio revitalization Fund – brownfield grant for portion of site	\$3,000,000
Department of Commerce National Oceanic and Atmospheric Administration – grant for acquisition of land to be dedicated as park	\$1,450,000
US Department of Transportation – grant for bulkhead repair and boardwalk construction	\$4,550,000
Cleveland 2005 G.O. grant	\$1,000,000
Stat of Ohio 2006 Capital Budget – grant	\$1,000,000
Cuyahoga County Brownfield Redevelopment Fund – brownfield remediation load (45 percent forgivable)	\$4,000,000
Cleveland Development Advisors – load repaid with project revenue	\$3,500,000
Cleveland Core City Fund – loan repaid with project revenue	\$6,000,000
Other Grant Funds – Federal, State and Local sources in process	\$4,000,000

	Total	\$102,645,000
--	-------	---------------

Example 2: Westwood Station, Westwood, Massachusetts⁸

Project Overview

- 145 acre site adjacent to a transit station – Westwood transit (15 minute commute to downtown Boston) and Amtrak station (express service to New York, Washington D.C. and Providence)
- TIF created in 2007
- New roadways, utilities, stormwater management and other infrastructure to facilitate a mixed-use transit-oriented “Smart Growth” project
- High density, mixed use development plan:
 - 1.34 million sf retail
 - 1.49 million sf office
 - 2 hotels – 330 rooms
 - 1000 residential units
 - Open space
- Public infrastructure improvements
 - Roads
 - Utilities
 - School
 - Parks

Financing Package

- TIF being used to offset public infrastructure costs – TIF provides for about 20 percent of the infrastructure costs
- TIF will pay debt service on about \$20M of infrastructure over a 20-year period.
- TIF amount distributed over 20 years – \$39 M
- Project is eligible for a 5% state investment tax credit, which amounts to \$4.1M, based on a developer investment of \$82M

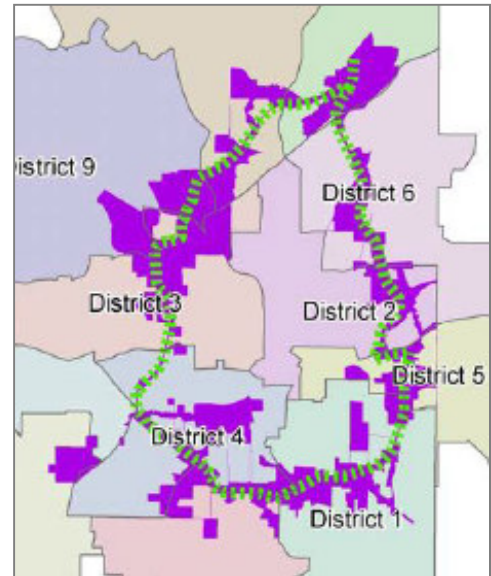
TIF funds for Infrastructure Improvements:	
Regional road improvements	\$28,968,000
Local road improvements, including utilities (sewer)	\$36,925,000
Sound attenuation and other neighbourhood improvements	\$2,168,000
Transit related costs	\$5,220,000
Aquifer water management and recharge	\$4,155,000
Power and utility capacity upgrade	\$11,532,338
Municipal and school facilities and equipment	\$10,400,000
Parks, landscaping and recreation	\$11,000,000
Total	\$110,368,338

Example 3: Beltline Tax Allocation District, Atlanta, Georgia

Figure 23: Beltline Tax Allocation District, Atlanta, Georgia

Project Overview

- City-wide TIF district (called a TAD) – 22-mile loop of partially abandoned railroad tracks and contiguous land approximately 6,500 acres in total (8 percent of the total city land area).
- Beltline TAD is city of Atlanta's 6th TAD district – it was approved in 2005.
- 25 year project includes:
 - New public transit route
 - 1,300 acres of parks and green space
 - 33 miles of trails connecting 40 parks
 - Environmental clean-up
 - Neighbourhood and historic preservation
 - Streetscape
 - 5,600 units of affordable housing
- Expected to encourage sustainable development patterns along the Beltline– several are underway



Source: Tax Increment Finance Best Practices Reference Guide, Council of Development Finance Agencies and International Council of Shopping Centers, 2007, pages 72-73. <http://www.atlantada.com/buildDev/beltline.jsp>

Financing Package

- \$1.66B in TIF bond proceeds over 25 years (seven separate bond issues anticipated)

Workforce housing	\$240,000,000
Land Acquisition	\$426,000,000
Greenway design & construction	\$53,000,000
Park design & construction	120,000,000
Transit construction	530,000,000
Transportation improvements	75,000,000
Public school projects	88,000,000
Brownfields and infrastructure	100,000,000
Administration and project management	32,000,000
Total	\$1,664,000,000

- Total project costs estimated at \$2.8B
- Other funding for improvements (such as federal grants) – \$471-\$971M
- Balance of funding from private, deferral, philanthropic and other local sources
- \$78M in bond issues (2008 & 2009)
- Anticipated Taxable Value of Beltline TAD – \$476.9M

Behavioural Impacts

TIF does not have a direct impact on travel behaviour or network performance. However, the spending of TIF proceeds indirectly support a change in travel behaviour through transit oriented development and transit- and pedestrian-oriented public realm. TIF provides the ability to affect and direct changes to land use and public infrastructure within a specific area, especially in order to achieve broader policy goals.

In addition to behavioural impacts, we list below relative advantages and disadvantages of TIF that have been debated extensively in recent years.

Advantages:

- Creates funding for targeted public infrastructure improvements
- Directs public infrastructure investment to support public policy objectives
- Attracts new development and supports redevelopment in areas where there is blight or economic decline and/or where there are obstacles to development
- Creates increased property value and additional tax revenues to taxing jurisdictions in the long term

Disadvantages:

- Can fail to bring new investment over and above what would have occurred in without TIF – it is difficult to prove whether development would have occurred without TIF; however if this is the case then this money could have been used to fund other public services (e.g. emergency services, schools, parks).
- Can serve narrow private interests – in the current economic climate, municipalities may be over-eager to bring in high profile development initiatives with the promise of jobs and economic activity; the level of public benefits may not always be justified by the level of subsidy offered.
- Can direct investment away from other areas in need – there is often a lack of clear criteria to guide the use of TIF and these loose definitions may serve to attract investment away from areas outside the designated TIF district.
- Can create additional costs if growth is less than anticipated – if a bond is issued but future development fails to materialize, then local government may have to use its non-TIF tax revenue as a bailout.
- May result in additional operating and maintenance costs for municipalities (e.g. road maintenance, public transit services)
- Can lead to misallocation of funds – as TIF budgets may not subject to same municipal budget rules, there is the potential for the misallocation TIF funds (e.g. some states allow funds to be shifted between TIF districts, creating the potential for directing funds for special interests).
- Process can lack transparency.
- Can have little accountability for results – TIF spending may receive less public scrutiny than other spending by local governments.
- May not be able to generate the predicted tax revenues, and the resulting lack of funds can threaten efforts to revitalize the designated area.
- May merely accelerate development that would have occurred anyway.
- Other taxing authorities (such as school boards) resent the freezing of their property taxes at a time when they are experiencing growth in demand as a result of the revitalization.
- Targeting funds to a designated area can be at the expense of development in other areas on the periphery of the district or in other parts of the municipality.

Governance, Implementation and Administration

Creation of a TIF district can be a lengthy process, especially if public input is part of the process, sometimes taking many years. TIF boundaries can change over time. TIF project plans and financing plans may need to be revisited and revised at various points during the life of the district.

TIF districts can be governed by an appointed board of directors (i.e. representatives of the taxing authority, property owner, developer) with oversight from the municipality.

Depending on the size and rate of growth of a TIF district, administration can vary from a consulting service, to a staff of one or more. TIF districts are often combined with redevelopment authorities and other overlay districts, which can share administrative support. The cost to administer a TIF district is generally considered an eligible TIF expense. Administration requirements can include maintaining TIF records, coordinating board meetings, preparing annual reports, and government and public relations.

Equity and Distributional Implications

By redirecting investment to blighted areas, TIF can improve vertical equity. However, this can be viewed as compromising horizontal equity if it redirects investment away from other areas in need. TIF can also be viewed as serving narrow private interests.

Some taxing entities, such as school boards, are exempted from participating in TIF districts, as they resent the freezing of their property tax revenues at a time when they may be experiencing growth in demand as a result of the revitalization and new development.

Overall Economic Efficiency

This revenue tool can generate efficiency gains if the TIF zone attracts increased investment which is not completely offset by any reduced investment in other areas of the region outside the designated TIF district.

TIF does not have any direct impacts on travel behaviour, but the new infrastructure in the TIF zone may generate additional economic welfare (i.e. consumer surplus) for residents and visitors to the redevelopment zone. However, these welfare gains may be offset by the administrative costs of setting up and operating a TIF over its lifetime as well as any economic distortions arising from the TIF implementation, such as the displacement of investment and economic activity from other parts of the region.

Overall, the potential exists for TIF zones to generate efficiency gains and improve social welfare, provided these are implemented effectively.

References

¹ Rob Kerth, Fortier Group, and Phineas Baxandall, Ph.D, U.S. PIRC Education Fund, Tax Increment Financing: The Need for Increased Transparency and Accountability in Local Economic Development Subsidies, U.S. PIRG Education Fund, Fall 2011.

² http://en.wikipedia.org/wiki/Tax_increment_financing

³ Enid Slack, Municipal Finance and the Pattern of Urban Growth, C.D. Howe Institute Commentary, No. 160, February 2002.

⁴ Tax Increment Finance Best Practices Reference Guide, Council of Development Finance Agencies and International Council of Shopping Centers, 2007.

⁵ Tax Increment Finance Best Practices Reference Guide, Council of Development Finance Agencies and International Council of Shopping Centers, 2007, page 27.

⁶ Enid Slack, Municipal Finance and the Pattern of Urban Growth, C.D. Howe Institute Commentary, No. 160, February 2002, page 20.

⁷ Tax Increment Finance Best Practices Reference Guide, Council of Development Finance Agencies and International Council of Shopping Centers, 2007, pages 55-57.

⁸ Tax Increment Finance Best Practices Reference Guide, Council of Development Finance Agencies and International Council of Shopping Centers, 2007, pages 62-63

13. Road Space Rationing (Sao Paulo, Brazil)

Introduction

Policy Objectives and Motivation of Revenue Tool

Road space rationing is a common travel demand management (TDM) practice used in Latin American cities (e.g. Mexico City) to address the external costs of peak period vehicle travel. These costs include air pollution, traffic congestion, and more recently, oil consumption. Road space rationing artificially restricts demand by imposing a direct restriction on the number of vehicles permitted in the designated zone.

In Sao Paulo, traffic congestion is a major issue, largely attributable to the rapid economic growth and urbanization that has been experienced in the city and surrounding areas. Currently, Sao Paulo is the largest metropolis in the world which utilizes road space rationing, with a fleet of over 7 million private vehicles. Combined with insufficient infrastructure, a large population and low fuel prices, this means that Sao Paulo is one of the most polluted and congested cities in the southern hemisphere.

Revenue Potential

The *Rodizio de veiculos de Sao Paulo* (“rotating municipal vehicles”) or “Operation Time Peak” road space rationing system was introduced by the municipality of Sao Paulo in 1997, initially as a tool by which to improve air quality, with the focus since shifting towards reducing congestion. (In 1996, the state government’s environmental authority introduced a similar road space rationing scheme as a contingency measure to tackle problems of local air quality during the winter. The scheme covered the city of Sao Paulo and nine other municipalities in the region, but it was phased out in 1998, despite the positive environmental outcomes).

Under the municipal scheme, the restriction of vehicles into the “Expanded Center” (see **Figure 1**) is applied during peak weekday travel periods; 7am-10am and 5pm-8pm. For the first two years of operation (1996-1998), the restriction applied to the entire Sao Paulo metropolitan region; however, this was subsequently reduced to the demarcated boundaries of the Expanded Center (a 152 sq km area).

Vehicles subject to restricted travel into the Expanded Center are determined based upon the last digit of their licence plate, under the following guidance in **Table 9**:

Table 9: Licence Plate Restrictions by Weekday

Day	Digits Restricted
Monday	1 & 2
Tuesday	3 & 4
Wednesday	5 & 6
Thursday	7 & 8
Friday	9 & 0

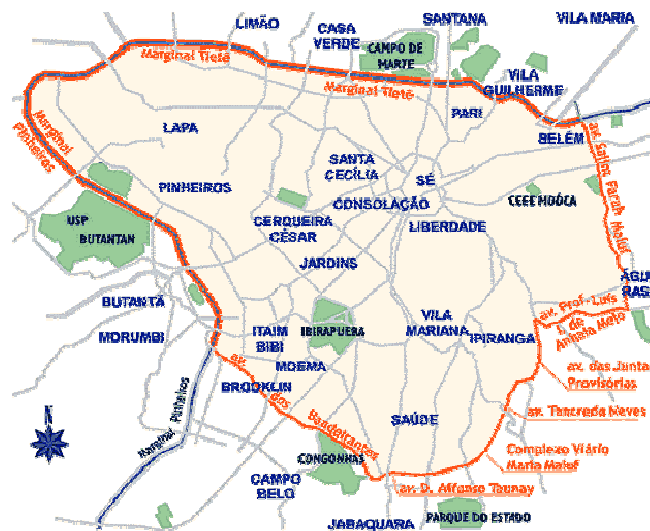
Source: City of Sao Paulo

Both automobiles and trucks are subject to the restrictions. Vehicles which perform essential services, such as public buses, school buses, and ambulances are exempted. Trucks transporting perishable goods and vehicles with disabled drivers or passengers are also exempted.

The restriction does not apply on weekends and during some public holiday periods. However, in these instances, trucks may still be prohibited from entering the Expanded Center. Residents are notified of these periods in advance through local media outlets. Furthermore, the City has the authority to lift the restriction at its discretion; such instances include periods of transit strike or disaster situations.

The restriction applies to all vehicles except public transit, school buses, emergency services, perishable goods vehicles, and disabled drivers.

Figure 24: Expanded Center, Sao Paulo



Revenue Impacts

The road space rationing program is not designed to be a revenue generating tool. The only revenues derived from the program are from non-compliance fines (R\$85; C\$47). Nevertheless, it is worth noting that 1.46 million trips are made into the Expanded Center every day by private vehicles and that the compliance rate for vehicles in the morning peak period has been observed at 90%.

Sao Paulo Toll Roads:

More applicable to revenue generation is that Sao Paulo has the highest concentration of toll roads in Brazil. Since 1996, the state has privatized most of its highway infrastructure, with companies contracted to manage sections of the highway grid, which totals some 3,500km. All road concessions are tolled in order to pay for the investment; the toll pricing is set by the State Secretary for Transportation and varies from \$C1-4/trip. The system of highways in Sao Paulo uses an electronic toll collection (*Sem Parar/Via-Facil*) system which generates approximately R\$120 million (C\$67 million) per month.

Behavioural Impacts

Road space rationing systems may have had some initial success in reducing road trips and congestion, including through a shift to public transit and an increase in car-pooling. However, these benefits have been offset over time in part through important adverse behavioural effects. Most importantly, the following behaviour has been observed not just in Sao Paulo but in other Latin American cities, including Mexico City:

- Higher-income households will often purchase an additional car with a different last digit on the licence plate in order to circumvent the rotation system on certain days. Since new cars are relatively expensive in Latin America, these additional cars are often older, higher-emission vehicles, and therefore undermine the pollution-reduction objectives as well as the decongestion benefits of the road rationing scheme.

In addition, the implementation of road space rationing was not accompanied by any new investments in public transit to support the desired mode shift. In fact, the scheme has been described as “an isolated measure that was not part of a more general strategy or transport policy” (see 6th bullet in the reference section below).

A 1998 survey by Sao Paulo local authorities estimated that there was an overall reduction in congestion of 18% within the restricted area, with a greater reduction in the morning peak (37%) and evening peak (24%). This was accompanied by an increase in average speeds in certain main corridors within the city centre by up to 24% during the evening peak.

However, these initial findings were soon offset by an increase in the overall private vehicle fleet in Sao Paulo, which went from 3.5 million vehicles in 1997 to 5 million in 2003 and is now estimated to be over 7 million. It is estimated that 1000 new vehicles are registered in the Sao Paulo area every day, driven in large part by the rapid economic growth and urbanization of the region.

By 2004, congestion levels were considered similar to or worse than the levels prevailing at the start of the scheme. In the same year, the state environmental agency reported a modest improvement in air quality in the metropolitan region of Sao Paulo, largely attributable to fleet renewal and cleaner fuel technologies in newer cars.

Governance, Implementation and Administration

The system was established by municipal law in October 1997. This followed a similar strategy implemented by the state in 1996 which was focused on reducing air pollution and external costs to public health in the winter, and which applied to the city of Sao Paulo and nine other municipalities in the metropolitan region.

Drivers who are caught violating the restriction are subject to a fine of R\$85 (C\$47) and four demerit points (at 21 points the licence is suspended). The enforcement of the restriction is through the use of 200 roadside cameras and traffic enforcement officers at entry points on boundary roads.

The local population and key stakeholders in Sao Paulo were not consulted prior to the implementation of the scheme.

Equity and Distributional Implications

Road space rationing is considered by transport economists to be an alternative to congestion pricing. It is sometimes considered to be more equitable across income groups because the restrictions (e.g. licence plate based) require all drivers to reduce auto travel at some point, while congestion pricing does not necessarily restrict those who can afford to pay the charge. However, this vertical equity is subverted in practice, because more affluent households can avoid the restrictions by purchasing a second car and are therefore better-positioned to avoid the restriction.

Overall Economic Efficiency

The potential decongestion and emission reduction benefits of road space rationing are partly undermined and offset through the increased incidence of second-car ownership. When the additional capital, operating and enforcement costs are taken into account (as well as the inefficiency costs associated with complying with and subverting the license plate restrictions), we believe that this scheme may well reduce economic efficiency.

In addition, as has been observed in Sao Paulo, any decongestion benefits of road space rationing can be offset or even outweighed by the impact of rapid economic growth, the associated higher living standards and a subsequent rise in car ownership. Road congestion can in turn be an important driver of mode shift in major cities, but this requires the available public transit services and public transit network capacity. In Sao Paulo, this condition does not always hold. The Metro system has only 74km of track to serve a major conurbation of 20 million people over an area of 8,000 sq km.

References

- <http://www.cidadedesapaulo.com/sp/br/transportes/rodizio-municipal-de-veiculos>
- <http://www.telogis.com/exclusion-zone-compliance-saves-time-money-and-the-planet/>
- http://pt.wikipedia.org/wiki/Rod%C3%ADzio_de_ve%C3%ADculos_de_S%C3%A3o_Paulo
(external Brazilian news source)
- <http://noticias.uol.com.br/ultnot/especial/2008/transito/2008/05/09/ult5848u3.jhtm>
- http://pt.wikipedia.org/wiki/Rod%C3%ADzio_de_ve%C3%ADculos_de_S%C3%A3o_Paulo
(external BBC Brasil news source)
- <http://www.epomm.eu/ecomm2004/workshops/anglais/Camara.pdf>
- http://www.ce.utexas.edu/prof/kockelman/public_html/TRB01BayBridgeCongestionPricing.pdf
- <https://www.dot.ny.gov/programs/repository/Tech%20Memo%20on%20License%20Plate%20Rationing.pdf?nd=nysdot>
- <http://www.guardian.co.uk/world/2008/jun/20/brazil>
- <http://www.tableaubordmontreal.com/comparons/activiteeconomique/pibpercapita.en.html?mode=print>
- <http://www.braanz.com/brazilian-news/259-sao-francisco-do-conde-has-the-highest-gdp-per-capita-in-brazil.html>
- http://www.businessresearch.eiu.com/sites/default/files/downloads/Public%20transport%20in%20Brazil_0.pdf
- http://www.toronto.ca/planning/pdf/cordon_count_2006.pdf
- http://www.itdp.org/documents/st_magazine/ITDP-st_magazine-16.pdf

14. Transit Fare Restructuring and Distance-Based Fares (Singapore)

Introduction

Until the late 1980s, public transit fares in Singapore consisted mainly of cash fares paid to the bus driver on boarding a bus. In 1990, an integrated ticketing system (ITS) was introduced to provide a common fare payment system on both rail and bus services, using a magnetic ticket termed the “farecard”, a stored value facility. For buses, the payment system under ITS remained largely manual, where a user would insert his farecard and select the relevant fare to receive a ticket for his ride. The fare structure was based on ticket type (adult, concession etc.) and the number of fare stages travelled.

In 2002, after three years of development, the Land Transport Authority (LTA), which is part of the Ministry of Transport, rolled out the Enhanced Integrated Fare System (EIFS)¹. The new system used contactless smartcards to replace the magnetic farecards. EIFS offered several enhancements including:

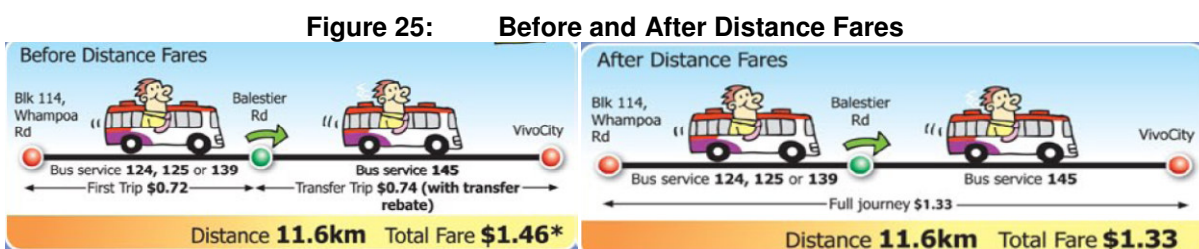
- smaller fare increments (1 cent) to provide greater flexibility for fare setting based on the distance travelled (number of fare stages).
- an extended fare structure to allow users to transfer between different transit networks (i.e. different operators) without having to buy separate tickets.

The fares in place in 2002 consisted of a flat rate (for any trip up to 3.2km) and rising fares on a per km basis up to a cap of 40 km. Hence, the fare structure already contained a distance-based component. However, the initial component would create a transfer penalty when compared to a similar-distanced journey without a transfer. A direct journey involves taking only one bus or train trip from start to destination (i.e. only one boarding and no transfers). An indirect journey involves at least one transfer (i.e. at least two boardings) between bus and/or rail services.

To facilitate trip transfers on a journey, a financial rebate of 25 cents (2006) was provided for journeys with transfers (up to three transfers). A flat fare applied to four or less fare stages travelled. For example:

- Direct Journey (16 fare stages) S\$1.43;
- In-direct journey (10 fare stages) S\$1.23 + (4 fare stages) S\$0.72 (- \$0.25 transfer rebate) = S\$1.70

In 2008, as part of the Singapore Government Land Transport Masterplan (2008)², a more integrated distance based fare system (Distance Fares) was proposed based on the distance (kilometres) travelled without incurring additional cost for transfers, thus offering greater choice and flexibility in how users plan their journey. Under this system, users travelling the same distance, pay the same fare for the same type of service, whether they travel direct or use multiple services. The new Distance Fares structure became operational in July 2010 and is more equitable as it corrects the penalty previously paid for transferring services.



Source: Singapore Land Transport Authority, PublicTransport@SG

http://www.publictransport.sg/content/publictransport/en/homepage/CommutersGuide/fares_ticketing.html

Distance Fares offer users more choices and flexibility to decide on the best route to reach their destination. A person who prefers a direct service despite a longer travel or waiting time can choose to wait for one, whilst another person who wants a quicker or shorter journey can choose to hop onto the first bus and make transfers along the way without paying more.

Objective

- To facilitate an integrated public transport system by removing fare penalties on transfers
- Increase public transport mode share from 59% in 2008 to 70% by 2020³
- To double 2008's 5.6 million daily public transport journeys by 2025²
- Provide choice and flexibility for users to choose the most efficient route (in terms of time and distance)

Revenue Potential

All users are charged a fare based on their total distance travelled (whether on the bus or train). The distance based fare scheme brings about a more integrated fare structure that allows commuters to make transfers without incurring additional costs. Fares are computed on a journey length basis, without a boarding charge being imposed for every transfer trip that makes up the journey.

The system operates with the use of smartcards (EZ Link or NETS Flashpay), where the user must 'tap in' and 'tap out' at entry and exit processors which capture information for fare calculation (bus service number, direction, entry and exit fare stages). At the entry processor, the maximum fare for the remaining trip is deducted from the card. At exit, the actual fare is calculated and the unused fare refunded onto the card. Therefore, it is important that users 'tap in' and 'tap out' when the card reader is on the correct display otherwise additional costs are incurred as the maximum fare is applied.

The system operates on the basic trunk and feeder buses, express bus services and Mass Rapid Transit (MRT) / Light Rail Transit (LRT) services. However, the new fare system does not apply to premium services including the premium bus service and night buses (which generally charge a flat rate for travel).

Operation restrictions as per the Singapore public transportation authority web site consist of:

- Within a single journey, a maximum of 5 transfers are allowed, with a 45 minute allowance between each transfer
- There is a 2 hour limit to complete a journey
- During a journey, the train network should only be entered and exited once
- The same bus service number should not be used more than once in a journey (regardless of the direction of the journey).

Ticket Types

Users can still pay by cash (on buses) or by using a single trip ticket (MRT/LRT), for which a higher fare applies and can check their fares from the fare tables available at bus stops and interchanges or on posters at MRT/LRT stations. There are a variety of stored value smartcards and concession passes available depending on whether the passenger is a child, student, adult, senior citizen, or tourist. Smartcards can be topped up at a variety of locations:

- Operators Ticket Offices or Passenger Services
- ATMs
- Online (EZ Link)
- Automatic Top (if registered)
- 7-Eleven and convenience stores (transaction fee charged)

Table 10: Distance Fares – Types of Tickets Prices

Ticket Type	Basic Card Cost/Deposit	Travel Value	Comment
Standard Ticket	S\$1.00 (C\$0.80) (refundable on return)	Variable depending on purchased fare	MRT/LRT only valid for use on day of purchase
Adult Stored Value Smartcard	S\$5.00 (C\$4.00) (non-refundable)	S\$10.00 (C\$8.00) (can top up to \$500 (C\$396))	EZ-Link or NETS
Concession Card	Nil	S\$5.00 (C\$4.00) (can top up)	EZ-Link or NETS
Tourist Pass	S\$10.00 (C\$8.00) (refundable on return within 5 days)	S\$8.00 (C\$6.30)	Unlimited MRT/LRT and bus travel for a day

Source: Singapore Land Transport Authority, PublicTransport@SG

http://www.publictransport.sg/content/publictransport/en/homepage/CommutersGuide/fares_ticketing.html

Fares are structured with a flat fare rate for any trip up to 3.2km, and then incremental fare increases per km for trips of longer distance up to 40.2km, where the fare rate is capped.

Discounts

- Senior citizens – 25% discount off adult fares and a flat fare for travel beyond 7.2 km.
- Children and students – 50% discount off adult fares and a flat fare for travel beyond 7.2km.
- Travel on non air conditioned buses (trunk only) – up to 23% discount depending on distance. The majority of buses (97%) are air-conditioned so this discount only applies to a small number of journeys.

Revenue Impacts

The EIFS cost S\$300 million (C\$236 million) to implement in 2002⁴. The government showed a strong commitment by providing significant funding for the upfront cost of developing the system¹, which in turn helped to secure support from the public transport operators. The new EIFS entry/exit processing system resulted in a significant reduction in fare leakage for bus operators, estimated to be in the region of S\$35 million (C\$27.5 million) annually¹.

Improvements to the card system delivered cost savings as the contactless smartcards are more reliable and durable than magnetic farecards with a failure rate of 1 in 25,000 transactions compared to 1 in 5,000 transactions for magnetic farecards.⁵ This means users spend less time and money replacing faulty cards. The operators also benefit from a substantial reduction in equipment maintenance and operating costs, with operating costs of only 5% to 9% of capital costs.⁵

The implementation of Distance Fares had two financial components. The cost of the system upgrades, hardware and software development including updating information at bus stops, websites and online portals was borne by the Government. However, the cost of removing the transfer penalty was largely absorbed by the operators, who covered about two-thirds of the costs of the transition. The remaining cost for the new system was distributed across all users in fare increases. The details of the financial impact are not available as the cost was covered by the private operators, so details were not released.

Overall, the operators have borne a permanent reduction in fare revenue since Distance Fares.

Financial savings⁶

After implementation of the scheme, analysis of 24 million journeys over a one week period showed that 68% of all adults saw average weekly fare savings under the new system, slightly above the 63% originally projected. For senior citizens, 74% now experience fare savings with 5% saving more than S\$2.30 (C\$1.80) a week.

Behavioural Impacts

More travel choice and flexibility⁶

If a commuter is able to shorten their travelling time or distance by making transfers, the new system provides the flexibility to do so, at no extra cost.

Changing travel patterns⁶

Based on data from the old fare system using prevailing travel patterns it was forecast that 63% of all users would experience fare savings. The actual figure was 68%, indicating that some users have already started to optimise their journeys by taking advantage of the flexibility offered by the new system to choose routes to save time or improve their ride comfort.

Improved network efficiency⁶

Users are now incentivised to choose the shortest distance possible, be it a direct or transfer journey, to get to their destination, thus making the most efficient use of the public transport network capacity, especially at peak times.

Implementation and Administration

In 1994, it was decided by the LTA that the magnetic farecard had to be replaced by 2002. By 1998, following laboratory tests and a field trial (with 1 million transactions testing the system), an automatic fare system (EIFS) was conceptualised and ready for construction. The roll out of the EIFS was helped by a comprehensive communications strategy that achieved buy-in from various stakeholders and ensured a smooth and successful implementation of the new ticketing system. Preparation for the launch of the EIFS began in 2000 with extensive media releases and public education. In April 2002, the EIFS was launched and run in parallel with the magnetic farecard to allow the public time to buy the new smartcard and familiarise themselves with the new system, with the switchover complete by December 2002.

For Distance Fares, the system of smartcards had been in operation since 2002 so the infrastructure was already in place but the operating system behind the new distance based fares needed to be implemented. The Singapore Government outlined the plan in the 2008 Land Transport Masterplan². The new system was approved by the Public Transport Council (PTC), an independent body responsible for the regulation of the public transport network. The system and operating costs for switching to Distance Fares was funded by the Government. However, the cost for the removal of the transfer penalty was largely covered by the operators and supported with a small rise in fares agreed by the PTC. As the transport operators are privately owned, the disclosure of this financial information is difficult to obtain.

To facilitate the transition towards the new fare structure, transfer fare penalties were progressively reduced over two years by increasing the transfer rebate, by S\$0.15 (C\$0.12) to S\$0.40 (C\$0.31) in 2008 and a further S\$0.10 (C\$0.08) in 2009 to S\$0.50 (C\$0.39).

In the lead up to the Distance Fares scheme being implemented, the LTA released several educational brochures and videos explaining the changes to the system and how it would impact users.

Governance

In 2008, the Singapore Government, as part of the LTA Masterplan, set out plans to enhance the integration and efficiency of the public transport system, with the removal of the transfer rebate and a full distance based fare

system. The government did not hold any public consultation into the system or seek customer support. To assist this transition towards distance based fares, the PTC agreed to reduce the transfer fare penalty progressively over the years before the change by increasing the transfer rebate, by 15 cents and 10 cents in 2008 and 2009 respectively. The new Distance Fares become operational in July 2010, at the same time the transfer rebate was removed.

October 2008	15 cents increase (to 40 cents) in the transfer rebate for adult EZ Link fares
April 2009	10 cents increase (to 50 cents) in transfer rebate for adult EZ Link fares
July 2010	Introduction of Distance Fares
October 2011	Increase in fares; Extension of senior citizen discounts

Equity and Distributional Implications

Distance based fares correct the inequity with the previous fare system where transfer journeys were more expensive than direct journeys of the same distance due to a transfer penalty, thus making Distance Fares a fairer system in terms of horizontal equity.

The new system is fairer as all users pay the same fare for the same distance travelled regardless of the number of transfers. Previously, users making transfer journeys were effectively paying more to keep the fares lower for commuters who take direct journeys. The transfer penalty has been removed so that all users pay the same fare for the same distance travelled.

In terms of vertical equity, a distance based fare system can be less equitable than a flat fare system. For example where low-income residential areas are located on the outskirts of a city, the poorest users may pay more to travel to the city centre as a result of the transition to distance-based fares. To alleviate this, low-income families including senior citizens who may need assistance with fare increases under Distance Fares, get Government assistance through various community-led initiatives and work support schemes under the Community Development Councils.

Overall Economic Efficiency

The removal of transfer penalties so all journeys of the same distance pay the same cost irrespective of the number of transfers provides an incentive to users to find the most efficient journey for their trip at no extra cost.

The interoperability of the smartcards used on public transport with other services vastly improves the efficiency of the public transport network as it enables people to reduce the transaction costs associated with a wide range of everyday purchases.

References

- ¹ http://www.ltaacademy.gov.sg/doc/J09Nov-p53Prakasam_E-Payment.pdf
- ² http://www.lta.gov.sg/ltmp/pdf/LTMP_Report.pdf
- ³ http://www.ptx2uitp.org/sites/default/files/showcase_pdf/107_singapore.pdf
- ⁴ http://www.lta.gov.sg/corp_info/doc/UTIP%20-%20EIFS%20Implementation.pdf
- ⁵ http://www.lta.gov.sg/corp_info/doc/UTIP%20-%20EIFS%20Implementation.pdf
- ⁶ http://www.thegovmonitor.com/world_news/asia/singapore-distance-fares-fairer-for-all-commuters-37101.html

15. TransLink Motor Fuel Tax (Metro Vancouver, BC)

Introduction

TransLink levies an additional tax on top of the federal and provincial excise taxes placed on gasoline and diesel sales in Metro Vancouver. The revenues collected have been used to fund transportation improvements within the jurisdiction of TransLink, which corresponds to the Metro Vancouver region. This motor fuel tax has increased several times since it was first introduced in 1999 and the recent decision to further increase the tax is borne out of a need to bridge the funding gap for major transportation projects.

In October 2011, TransLink’s \$1.4 billion “10 Year Transportation and Financial Plan” was approved by the Mayor’s Council on Regional Transportation. The purpose of the plan is to raise an additional \$70 million in annual revenue in order to help fund the Evergreen Line and other investments.

The proposed funding formula shown in **Figure 26** includes the increased Motor Fuel Tax, which is expected to generate an additional \$40 million annually, plus one of two other options. One option is a time-limited property tax levied in 2013 and 2014; the other option is a new long-term revenue source to be implemented in 2012 and replace the property tax portion of the funding package.

Figure 26: Proposed Funding Formula



Source: TransLink

Revenue Potential

As shown in **Figure 27**, Metro Vancouver encompasses 21 municipalities, Electoral Area A (part of the Greater Vancouver Regional District including several unincorporated areas) and the Tsawwassen First Nation; a total area of approximately 2,900 km². In addition to the TransLink motor fuel tax, all gasoline and diesel sold within Metro Vancouver includes the federal excise tax of \$0.10/litre, a provincial excise tax of \$0.1406/litre (including a carbon tax of \$0.0556/litre – to increase to \$0.0695 in July 2012) and 5% HST (HST of 12% applies to fuel but the 7% provincial portion is refunded at the point of sale). Drivers in Metro Vancouver are considered to pay one of the highest fuel taxes in major urban areas across Canada.¹

TransLink was formed in 1999 under the Greater Vancouver Transportation Authority (GVTA) Act, which in turn provided for the introduction of an \$0.08/litre motor fuel tax as well as other funding sources for the transportation

agency. In 2001 the Province agreed to a \$0.01/litre increase in motor fuel tax to help TransLink fund the operation of its Millennium Line, providing that TransLink matched this revenue with an increase in transit fares and property taxes. In 2002, the motor fuel tax was raised to \$0.11/litre. By 2003, the Province had a \$0.205/litre tax on fuel, of which TransLink received \$0.115/litre. In 2005, this share increased to \$0.12/litre. In 2007, the Province approved legislation which gave TransLink the authority to raise the motor fuel tax from \$0.12/litre to \$0.15/litre. Subsequently, in January 2010 the motor fuel tax was increased by \$0.03/litre to the present rate of \$0.15/litre. The new motor fuel tax rate of \$0.17/litre will be applied from April 2012 and as previously stated will form a key element of TransLink's 10 Year Transportation and Financial Plan.

Figure 27: Metro Vancouver



Source: Metro Vancouver

Revenue Impacts

Table 11 shows the revenues generated by the motor fuel tax from 2008 to 2012.

Table 11: Motor Fuel Tax Rates and Revenues

Year	Tax rate (cents/L)	Gross Revenue Generated (\$M, nominal)
2000	8	162.2
2001	9	184.9
2002	11	227.7
2003	11.5	242.7
2004	11.5	252.3
2005	12	254.6
2006	12	264.3

2007	12	267.6
2008	12	262.3
2009	12	259.8
2010	15	323.2
2011 (Budgeted)	15	324.3
2012 (Projected)	17	328.4

Source: TransLink

In 2008, the total motor fuel tax revenue for TransLink was \$262.3 million (29% of the total revenue of \$920 million, excluding provincial and federal grants for capital projects). By 2009, this figure had decreased to \$259.8 million (27% of the total revenue of \$970.4 million). This decrease in revenue from motor fuel tax was believed to be attributable to the recession at the time. In 2010, the total motor fuel tax revenue was up to \$323.2 million due in large part to the increase in motor fuel tax from \$0.12/litre to \$0.15/litre.

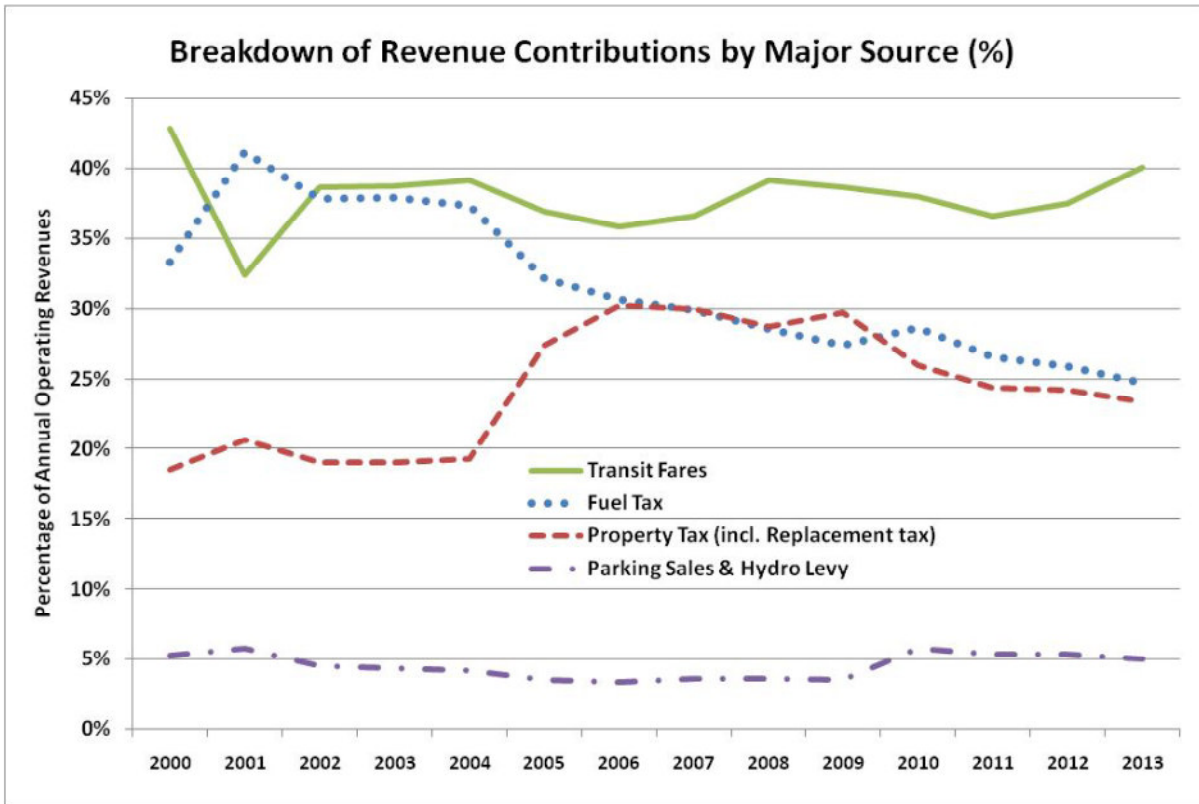
In 2011, TransLink expected to collect approximately \$324 million in motor fuel tax revenue, but the latest financial report from the agency indicates that fuel tax revenues are now expected to come in at \$298.5 million (\$26 million less or 8% short). According to a spokesperson for the agency, it is not clear whether the shortfall is due to a slower economy than originally anticipated, leakages in sales to neighboring areas where the fuel tax is not applied (as in part of the Fraser Valley and Washington State), drivers switching to vehicles with better fuel economy, and/or to some drivers switching to public transit.²

In 2012, the projected revenue from motor fuel tax is again projected to be about 27% of the total revenue generated, or \$328.4 million, but this may now prove to be optimistic in light of the 2011 revenue yield. By 2021, the outlook is for revenues of \$368.1 million to be generated by the motor fuel tax, which would mean an average annual increase in revenue of 1.3% per year.³

As stated, the motor fuel tax accounted for 27% of TransLink's total revenue for 2010. This is second in order of magnitude to transit fares (34%), and greater than property tax (23%). All other revenue sources accounted for less than 10% of the total respectively, including the parking sales tax (5%). In total, taxes account for over half of TransLink's total revenue (58% in 2010). However, despite the increase in the fuel tax rate since 1999, fuel tax revenues have steadily decreased as a percentage of TransLink's overall revenues.⁴ In 2001 it accounted for over 40% of the total but has since fallen to under 30%, as shown in **Figure 28**. Fuel tax revenues are projected to increase over the next 10 years, but continue to decline as a proportion of overall revenues.

TransLink estimates that a \$0.01/litre increase in the motor fuel tax generates approximately \$22 million in revenue. The revenue case for the motor fuel tax is strengthened by the low collection costs involved and limited opportunities for evasion, given the natural boundaries and topography of Metro Vancouver.⁵

Figure 28: Breakdown of Revenue Contributions by Major Source (%)



Source: TransLink "Backgrounder: History of Funding for TransLink", Mimeo., February 2011.

The 2006 Census shows that in Metro Vancouver (Greater Vancouver for statistical purposes), over 675,000 people drive as their primary mode of transportation to work. This provides a crude approximation of the number of potential drivers affected by the motor fuel tax, but it excludes drivers who do not reside in the region.

Behavioural Impacts

The extensive literature on the micro-economic adjustments in behaviour arising from fuel taxes indicates that drivers reduce their demand for fuel (in response to higher prices) by driving less and by switching to more fuel-efficient vehicles (e.g. in multi-vehicle households). In the short-term, both these effects are inelastic (e.g. the percentage reduction in vehicle kilometres driven resulting from the tax-induced fuel price increase is much smaller than the original percentage increase in fuel prices), because drivers have relatively limited discretion to alter their behaviour.⁶ The ability to re-organize and postpone their trips (incl. car-pooling), to switch to public transit or active modes of travel, to cancel their trips altogether and to purchase more fuel-efficient vehicles is very limited. Over the longer-term (typically 2-5 years), drivers have much more discretion to re-organize their travel commitments and they also have opportunities to change their vehicle purchases in order to manage their fuel consumption. As a result, the response in demand for fuel and for vehicle kilometres driven is several times greater than in the short-term.

There have not been any studies which have directly investigated the micro-economic impacts of the fuel taxes introduced in Metro Vancouver. However, a note by TransLink staff suggests that the elasticity of vehicle kilometres

driven with respect to fuel prices is -0.1 in the short-term and -0.3 in the long-term, based on a report by Goodwin et al (2004).⁷ Since average gasoline prices were \$1.15/litre in Vancouver in 2010, the \$0.15/litre tax represented approximately a 15% price increase. Using the above elasticities, this means that Vancouver drivers reduced their vehicle kilometres driven by 1.5% in the short-term and by 4.5% in the long-run. When adding in the effect of switching to more fuel-efficient vehicles, the note implies that fuel consumption has dropped by 3.75% in Metro Vancouver in the short-term and will drop by 9% over the long-term as a result of the \$0.15 cent hike. As a result of both reduced VKT and a more fuel-efficient fleet, fuel taxes contribute significantly to improved air quality, fewer GHG emissions. The VKT reduction will translate into fewer collisions and safer roads. The extent to which the VKT reduction actually leads to reduced congestion depends on the magnitude of the so-called “congestion feedback” effect – i.e. the initial reduction in VKTs could be partly offset as some drivers dissuaded by high congestion (prior to the fuel tax hike) take advantage of the congestion relief and increase their VKTs. A significant congestion feedback effect would also offset some of the environmental and safety benefits of the fuel tax hike.

In the long-term (i.e. 2-5 years and possibly longer), current and potential drivers may also alter the location decisions for their work, residence and other amenities, so as to optimize on travel costs.

Implementation and Administration

The TransLink fuel tax is collected by the Province on behalf of TransLink and then remitted to the agency. Since the Province already collects its own excise and fuel taxes across all its territory, there are no significant incremental costs to ring-fencing the revenue collected from points of sale in the Metro Vancouver region and remitting these revenues to TransLink. Nor have there been any obvious time delays in implementing the changes in fuel tax rates, even though changes in the provincial enabling legislation for TransLink were required to increase the tax rate to \$0.17 cents/litre (since the allowable fuel tax levy for TransLink had been capped at \$0.15 cents/Litre in the enabling legislation, the South Coast British Columbia Transportation Authority Act (the SCBCTA Act)).

It is important to note that the topography and natural boundaries of Metro Vancouver – ocean to the west and southwest and mountains to the North – are crucial in limiting tax avoidance by drivers in Metro Vancouver. Nevertheless, there appears to be some evidence of significant leakages of fuel tax revenue in the southeast part of Metro Vancouver, where it borders the Fraser Valley and Abbotsford in particular. There also appears to be some leakage to Washington State to the South and to the Squamish Lillooet Regional District to the North. While tax avoidance may be somewhat constrained by natural boundaries, the incentive to engage in such behaviour depends on the net monetary gains which can be realized (i.e. after taking into account the resource and time costs from any travel diversions required to purchase fuel outside of Metro Vancouver. At low tax rates (e.g. 5 cents/L) the resulting price differences may not be sufficient to encourage much tax evasion behaviour (other than by those who reside in or visit the lower-tax jurisdictions). At 20 cents/L, the incentives are much stronger and hence, leakages may be significant, particularly since the price differential is even larger than 20 cents/litre in Washington State. TransLink is currently assessing the importance of these leakages and their impact on fuel tax revenues.

Governance

The recent decision to increase the motor fuel tax to \$0.17 cents was agreed upon by the Mayor’s Council on Regional Transportation. Upon acceptance of this plan, the motor fuel tax increase was proposed to the Province. Subsequently, in October 2011 the Minister for Transportation introduced the necessary legislation under “Bill 11 – 2011 Greater Vancouver Transit Enhancement Act” and amendments to the SCBCTA Act and the Motor Fuel Tax Act.

Taxpayers can access information regarding the fuel tax rates in TransLink’s annual reports and strategic plan documents posted on the central website.

Equity and Distributional Implications

Fuel taxes are very closely aligned with the user-pay principle, because the amount of fuel consumed relates directly to the amount of driving and to the use of road infrastructure. This ensures horizontal equity (i.e. those who pay also benefit from how the revenues are spent), provided that the fuel tax revenues are used to maintain and upgrade the road infrastructure used by fuel tax payers and that the charge is broadly in line with the cost of road infrastructure usage.

It is often said that fuel taxes and other consumption taxes are regressive, because these taxes make up a higher share of income for low-income households than for high-income households. However, this view is misleading, because the progressivity of these taxes should be evaluated on a lifetime basis. As Hines (2007: 67) points out, “it would be a mistake to infer from the fact that affluent retirees might have little current income but significant current expenditures that excise taxes are regressive”. Seminal work by James Poterba (1991) showed that when the incidence of U.S. gasoline taxes is examined on a lifetime basis, these taxes are not regressive, but are in fact mildly progressive.⁸ Specifically, he found that fuel consumption rises more than proportionately with affluence for most of the range from low-expenditure to high-expenditure households. These results, which were confirmed in subsequent research, suggest that concerns about the regressivity of fuel taxes may have been overdone at best.

However, this does not preclude other distributional consequences of gas taxes. For example, fuel taxes may be borne disproportionately by households which are more reliant on personal vehicle travel, such as those in rural areas and suburban areas with fewer transit services. This can be an important consideration for large regions such as Metro Vancouver, where the availability of public transit services can vary significantly.

It is also worth noting that the revenue generated by the fuel tax in this case goes largely towards funding public transit improvements, which may benefit particularly less affluent households. The main project currently funded by the fuel tax is the proposed Evergreen Line Rapid Transit Program (Figure 29). This is a new 11km SkyTrain line connecting Coquitlam and Vancouver via Port Moody and Burnaby. The project will include upgrades to two stations, five new Rapid Transit stations, 28 additional SkyTrain vehicles, new bus loops, and community network integration and wayfinding upgrades. This project was originally scheduled to be operational by 2014 but has been delayed owing to a shortfall in funding TransLink’s \$400 million share (the project is funded jointly with the provincial and federal governments).

Figure 29: Proposed Evergreen Line



Source: BC Ministry of Transportation and Infrastructure

In addition to the Evergreen Line project, there will be a 7% increase in annual bus service by 2013, an 8% increase in transit boardings (30 million rides annually) and a 9% increase in total transit service hours by 2016/17. Funding for the Major Road Network under the responsibility of TransLink will also increase from \$10 million to \$20 million, while funding for the Bike Capital Program will increase from \$3 million to \$6 million.

Overall Economic Efficiency

The overall efficiency impact of the TransLink fuel tax may well be negative, despite the significant positive behavioural impacts, the improved transportation network performance and the absence of incremental implementation costs. This is due to the costs associated with the economic distortions from the fuel tax. According to a recent study of the micro-economic effects of raising US gasoline taxes, efficiency costs are in the range of \$0.15 to \$0.25 cents per dollar of revenue raised.⁹ The efficiency costs from the \$0.17 cent TransLink tax may well lie at the high end of this range for several reasons:

- Greater potential for tax avoidance (i.e. re-fuelling in adjacent areas outside Metro Vancouver) as compared to the US fuel taxes which are applied at the national (federal) level, with various tax rates also applied at the state level
- The overall rate of fuel taxes in Metro Vancouver – at approximately \$0.44 cents/litre – is four times higher than the average gasoline tax in the US (consisting of the federal tax plus the average state tax), which is \$0.41/ US gallon (or \$0.11/litre).¹⁰

References

TransLink sources:

- TransLink 10-Year Transportation and Financial Plan: <http://www.translink.ca/en/Be-Part-of-the-Plan/10-Year-Transportation-Plan.aspx>
- TransLink 2012 Supplemental Plan: <http://www.translink.ca/en/Be-Part-of-the-Plan/10-Year-Transportation-Plan/2012-Supplemental-Plan.aspx>
- TransLink 2012 Base Plan and Outlook: <http://www.translink.ca/en/Be-Part-of-the-Plan/10-Year-Transportation-Plan/2012-Base-Plan-and-Outlook.aspx>
- TransLink 2012 Supplemental Plan and Outlook: “Moving Forward 2012 Supplemental Plan and Outlook”, TransLink, October 7 2011
- TransLink 2009 Annual Report
- TransLink 2010 Annual Report
- “Motor Fuel Tax: Overview”, TransLink, January 2011

News articles:

- <http://www.cbc.ca/news/canada/british-columbia/story/2011/07/06/bc-translink-gas-tax.html>
- http://www2.news.gov.bc.ca/news_releases_2009-2013/2011TRAN0089-001314.htm
- <http://www.bcclocalnews.com/news/135702678.html>

Other:

- Ministry of Finance Tax Bulletin: “Tax Rates on Fuels: Clear Gasoline Tax Rates per Litre”, BC Ministry of Finance, July 2011
- Statistics Canada – 2006 Community Profile (Greater Vancouver)
- “New Tools for New Times: A Sourcebook for the Financing, Funding and Delivery of Urban Infrastructure”, Casey Vander Ploeg, Canada West Foundation, 2006
- http://economics.about.com/od/priceelasticityofdemand/a/gasoline_elast.htm
- Natural Resources Canada: http://www2.nrcan.gc.ca/eneene/sources/pripri/price_map_e.cfm

¹ According to Natural Resources Canada, retail prices for regular gasoline as of January 3 2012 were \$1.28/litre in Vancouver (including 44 cents in taxes in total). This compared to \$1.28/litre in Montreal (including 45.9 cents in taxes in total) and \$1.20/litre in Toronto (including 38.6 cents in taxes in total) for the same period. See http://www2.nrcan.gc.ca/eneene/sources/pripri/price_map_e.cfm for further fuel price and tax data across Canada.

² See <http://www.bclocalnews.com/news/135702678.html>

³ The 1.3% CAGR is calculated using 2011 budgeted revenue (\$324.1M) and the 2021 revenue outlook.

⁴ The lower relative importance of fuel tax revenues stems partly from the rise in property tax revenues, which grew from \$130.6 M in 2004 to \$216.8 M in 2005 and up to \$260.9 in 2006. See Globe and Mail "Vancouver's property tax changes over time" March 31, 2012, <http://www.theglobeandmail.com/news/national/british-columbia/vancouver-property-tax-changes-over-time/article2388115/?from=2388100>.

⁵ However, there are some opportunities to evade the higher Metro Vancouver fuel taxes by driving southeast in the Fraser Valley and also by driving south across the U.S. border into Washington State, where the price differential relative to Metro Vancouver may be even greater than the current \$0.17/L tax differential between Metro Vancouver and the rest of British Columbia.

⁶ This means that short-run elasticity values are between 0 and -1. For example, see Tae Hoon Oum, W.G. Waters II, and Jong-Say Yong (1992), "Concepts of Price Elasticities of Transport Demand and Recent Empirical Estimates" in *Journal of Transport Economics*, May, pp. 139-154; or the *Victoria Transport Policy Institute "Transportation Elasticities: How Prices and Other Factors Affect Travel Behaviour" 21 July 2011*.

⁷ See TransLink "Motor Fuel Tax: Overview", p. 2, which refers to the Goodwin et. al "Elasticities of Road Traffic and Fuel Consumption With Respect to Price and Income: A Review" *Transport Review* 24 (May 2004): 275-292.

⁸ This involved examining fuel consumption as a share of expenditure across expenditure deciles, because current expenditure is a better indicator than current income for the purpose of tracking lifetime income.

⁹ Bento et. al (2009) "Distributional and Efficiency Impacts of Increased US Gasoline Taxes" *American Economic Review* 99: 1-37.

¹⁰ Ibid.

16. TransLink Parking Sales Tax (Metro Vancouver, BC)

Introduction

TransLink collects the Parking Sales Tax in order to generate revenue to pay for transit and road maintenance and improvements in the Metro Vancouver area. The Parking Sales Tax forms one element of a wider suite of tax revenues dedicated to TransLink, including the Motor Fuel Tax, Property Tax, Replacement Tax and Hydro Levy, which together form a significant portion of TransLink's overall revenue. **Table 12** highlights the tax revenues collected by TransLink over the last four years.

Table 12: TransLink Tax Revenues 2008-2011

Tax	2008 Revenue (\$M)	2009 Revenue (\$M)	2010 Revenue (\$M)	2011 Revenue (\$M Budgeted)
Parking Sales Tax	Not Indicated	15.6	58.4	49.2
Motor Fuel Tax	262.3	259.8	323.2	324.3
Property Tax	255.7	264.1	271.8	279.2
Replacement Tax (1)	8.8	18.0	17.8	18.0
Hydro Levy	Not Indicated	18.2	18.6	Not Indicated
<i>Total Revenue (All Sources)</i>	<i>920.0</i>	<i>970.4</i>	<i>1199.7</i>	<i>1382.2</i>

Notes: (1) Replacement tax refers to a property tax introduced in 2008 as a replacement for the Parking Site Tax, a flat tax on parking stalls or land area used for parking which was repealed by the Province in 2008 (See "Backgrounder: History of Funding for TransLink", mimeo., February 2011, pp. 3-4).

Sources: 2009 and 2010 Annual Reports and 2012 Base Plan, TransLink

Revenue Potential

In 2006, TransLink implemented a Parking Site Tax set at \$1.02 annually per square metre of non-residential parking area (approximately \$25-40 per parking space). This was subsequently lowered to \$0.78 per square metre or approximately \$23.40 per stall. This tax was collected by a provincial agency, BC Assessment, using the existing property tax structure. The Parking Site Tax applied to non-residential facilities, with exemptions for on-street parking, most buildings already exempt from property taxes (e.g. schools and religious buildings), and TransLink-owned facilities. This tax was very unpopular with small business owners, restaurants, hotels, entertainment venues and other commercial organizations in Metro Vancouver. It was perceived to be unfair to small businesses, expensive to implement, and applied to too broad a range of parking facilities (including bike racks, warehouse and loading bays and truck turnarounds).

In 2007, the Province amended TransLink's charter to eliminate this tax and replace it with other revenue sources, including a Parking Sales Tax. This was agreed upon after a governance review panel recommended its elimination and was approved by the BC Transportation minister at the time. It was also a result of the strong criticism the Parking Site Tax had faced from businesses during its implementation period. The Parking Sales Tax is applied to all parking transactions within TransLink's service area (Metro Vancouver), including a total of 21 municipalities, Electoral Area A, and the Tsawwassen First Nation. Initially, the parking sales tax rate was set at 7%, but in 2010 it increased to 21% of the purchase price of the parking rights sold to the customer before HST – the 12% HST rate is applied on top of the sale price¹.

TransLink considers taxable parking to be a site, space or any other area in which a motor vehicle may, for a price or other consideration, be parked for any period of time. Examples of taxable parking include parking lots and parkades, commercial and municipally-owned sites (e.g. hospitals or universities), residential building sites where visitors are charged, and accommodations or other businesses (e.g. retailers) where there is a separate charge for parking.

The Parking Sales Tax is also applied to sales at ticket vending machines and is included in the purchase price. Where a receipt is issued, the parking sales tax must be specified as a separate item, or the receipt must indicate that the purchase price includes the tax.

TransLink “Tax Bulletin 105 – Motor Vehicle Parking” outlines a number of exemptions to the Parking Sales Tax:

- Residential parking in/near the building where the resident lives if used as the primary parking while in the residence;
- Metered street parking – including pay & display meters for multiple spaces;
- Parking sites used for vehicles that cannot safely be driven;
- Long-stay parking sites purchased for 28 consecutive days or more and used solely for business purposes;
- Parking sites purchased by a person in the leasing business solely to park inventory while not leased;
- Parking sites provided with the purchase of temporary accommodation if there is no separate charge for parking;
- Parking sites provided with the purchase or lease of space in buildings above or near the parking space if there is no separate charge for parking;
- First hour free parking – tax is charged only on the amount that customer is charged;
- Sales to other retailers – tax is not charged on rights sold to other resellers if they provide their Parking Tax registration number; and
- Sales to members of diplomatic and consular corps.

Revenue Impacts

The revenues generated by the Parking Sales Tax for 2009 to 2012 are shown in **Table 13**:

Table 13: Parking Sales Tax Revenues

Year	Revenue Generated (\$M)
2009	15.6
2010	58.4
2011 (Budgeted)	49.2
2012 (Projected)	50.0

Source: 2009 and 2010 Annual Reports & 2012 Base Plan, TransLink

In 2009, the Parking Sales Tax rate was set at just 7%. In 2010, the rate was tripled to 21% (the legislative maximum) with Parking Sales Tax revenue rising more than threefold. This contributed, along with higher fuel tax revenues, to a \$114.1 million increase in overall taxation revenues for TransLink from 2009 to 2010.

Between 2012 and 2014, forecasts assume a 1.5% increase on the price of paid parking, based on rises in fuel prices, a rise in the Consumer Price Index (CPI), and increase in population. By 2021, the outlook for parking sales tax revenues is \$57.1 million.

Behavioural Impacts

In TransLink's 2009 Annual Report, it is acknowledged that the tripling of the Parking Sales Tax rate, as well as the addition of HST to that rate, may have reduced parking demand. However, there is no empirical evidence available on actual behavioural impacts.

As previously stated, the original Parking Site Tax was not favourably received by the business community in Metro Vancouver, particularly small business owners. Similarly, the tripling of its replacement, the Parking Sales Tax, in 2010 led to significant reaction among businesses. Over 30 businesses, organizations and associations from a variety of sectors have formed a coalition called "Drive out the Tax" to campaign against the parking sales tax increase, while the Downtown Vancouver Business Improvement Association (DVBIA) has also voiced its opposition.

Elasticity of parking demand estimates range between -0.2 and -0.4, meaning that for every 10% increase in parking prices, parking demand in terms of vehicle trips is reduced by 2%-4% (VTPI "Parking Taxes" February 2011; see http://www.vtpi.org/parking_tax.pdf p. 14). Travellers may respond to the higher parking prices by paying the extra tax (i.e. no behavioural response), changing travel modes, destinations, parking location or the duration of their parking and by suppressing or re-organizing some of their trips. **Table 14** indicates the average monthly downtown parking rates between 2006 and 2010.

Table 14: Average Monthly Downtown Parking Rates in Vancouver

Year	Average Monthly Downtown Parking Rate (\$)	Increase in Monthly Parking Rate over Previous Year (%)
2006	194	-
2007	209	7.7
2008	218	4.3
2009	224	2.8
2010	300	33.9

Source: Various

The introduction of the 7% Parking Sales Tax in 2007 will have contributed to an increase in average monthly downtown parking rates by 7.7%. This is likely to have reduced parking demand by approximately 1.5%-3% relative to the previous year, based on the above elasticities. Between 2007 and 2009, when the Parking Sales Tax remained at 7%, the average monthly downtown parking rate increased by a total of \$15, or 7.2%. This is likely to have led to a 1.4%-2.9% overall reduction in parking demand. However, with the introduction of the 21% Parking Sales Tax in 2010, the impact on average monthly downtown parking rates appears to have been substantial, leading to a 33.9% increase from 2009 (or \$76), although other market factors may also have played a role in the increase. This significant increase in cost may have led to a 6.8%-13.6% reduction in parking demand in just a single year, based upon the range of demand elasticities noted above.

Governance, Implementation and Administration

In July 2010, the Province gave the rights to TransLink to administer, enforce and collect the Parking Sales Tax. This was passed under the South Coast British Columbia Transportation Authority (SCBCTA) Act, Section 169. The Parking Sales Tax had been one of the taxes included in Provincial Sales Tax (PST), which was eliminated in July 2010 with the introduction of HST. As such, the Province made the decision to grant TransLink the legislated rights

for administration. Under the SCBCTA Act, TransLink is now permitted to raise revenues by means of taxes, including property, fuel and parking taxes.

As required by Section 169 of the SCBCTA Act, TransLink has appointed an Administrator for the Parking Sales Tax. To sell parking rights, a Parking Tax Certificate must be issued by TransLink. The Administrator has the authority to approve or refuse the issuance of registration certificates. Key elements of the registration certificate are as follows:

- The vendor must display the certificate in a prominent place at their principal place of business;
- Vendors selling parking rights at more than one place of business must obtain a duplicate certificate for each place of business – however a vendor is not required to obtain a duplicate certificate in respect of a place of business that is only a parking site;
- If a vendor changes the address of the principal place of business, then the certificate must be immediately returned to the administrator for amendment;
- If the name or nature of a business changes, the certificate must be immediately returned to the administrator and an application for a new certificate must be made;
- If a vendor loses the certificate or it is destroyed, the vendor must immediately apply for a duplicate of the original;
- If a vendor sells parking rights at more than one place of business, and ceases to sell parking rights at a place of business, the duplicate certificate for that place of business is void and the duplicate must be destroyed; and
- If a vendor ceases to sell parking rights at all places of business, the certificate is void and the vendor must, on or before the 23 days after the last day of the month in which the vendor ceases to sell parking rights:
 - Advise the administrator of the particulars
 - Submit the original and all duplicates of the void certificate to the administrator
 - Deliver a final return of sales and remittance.

Parking Sales Tax must be remitted directly to TransLink and payment can be made in person or by mail by either cheque or money order. All businesses remit tax returns monthly, quarterly, semi-annually or annually, depending on the amount collected per year:

- Monthly only: more than \$12,000;
- Monthly or quarterly: \$6,000 to \$12,000;
- Quarterly or semi-annually: \$3,000 to \$6,000; or
- Annually: \$3,000 or less.

If a late payment is made, interest is charged on the amount payable at 3% above the prime lending rate, in accordance with BC Reg. 386/92, Interest rate Under Various Statutes Regulation. Further actions on non-payment may include a lien on property, seizing of assets, or court action. TransLink may also conduct a formal audit of financial records to ensure that parking taxes are being collected and remitted.

Equity and Distributional Implications

From a vertical equity perspective a parking sales tax is considered to be more equitable relative to automobile usage-based revenue tools, because such facilities are primarily used by higher-income motorists, except from some urban neighbourhoods where low-income motorists also pay for parking. However, there are also potential impacts on the local business community resulting in changes to their operating costs, costs to their employees and the costs borne by their customers. This was highlighted by the marked increase in average monthly downtown parking rates in 2010 following the introduction of the tripled tax rate of 21%. The impacts of such significant parking price increases could prompt some businesses to change locations in order to reduce the effect of parking taxes on their sales or their operating costs (especially if they cannot pass the full increase in costs onto their customers).

This case study already detailed the specific exemptions to the parking sales tax, as described under the Revenue Potential section. Some of the exemptions can be considered complementary measures in the sense that they are designed to mitigate or avoid impacting certain groups or market segments. Some exemptions are designed to avoid impacts on residential parking, such as the following exemption:

- Residential parking in/near the building where the resident lives if used as the primary parking while in the residence;

Other exemptions are designed to minimize the impact of the parking sales tax on businesses and their employees, such as the two following exemptions:

- Long-stay parking sites purchased for 28 consecutive days or more and used solely for business purposes;
- Parking sites provided with the purchase or lease of space in buildings above or near the parking space if there is no separate charge for parking;

There are no complementary measures to mitigate the impact on low-income households.

Overall Economic Efficiency

A parking sales tax can lead to modest changes in travel behaviour, depending on how important the taxable base of priced parking is compared to all non-residential parking in any given area of the city. However, these changes in travel behaviour tend to be at least partly offset by the capital and administrative costs of running the scheme as well as the compliance costs borne by users and the economic distortions which may arise from the tax (e.g. from shifts in the location of employment and other economic activity).

The impact of parking sales taxes, such as this TransLink example, is limited to parking which is subject to a charge. This type of parking is generally concentrated in certain higher-density areas of the city, such as the CBD. Since charged parking represents a modest share of overall parking supply, a parking sales tax must collect significantly greater revenue per charged parking space than a per-space parking levy in order to deliver the same overall revenue objective. However, there are also practical limits to how high a parking sales tax is feasible, without adversely affecting the business of commercial parking operators. If commercial parking operators cannot fully pass the increased sales tax through to higher prices (e.g. due soft market demand conditions), the tax will reduce the commercial viability of certain parking operations and could lead to a closing down in their facilities.

In terms of gauging policy success, TransLink has certainly achieved its revenue generation objective in a way which it clearly had not done with the original Parking Site Tax. It is less clear whether or not TransLink sought to achieve any other policy objectives with this revenue tool, such as a reduction in commuter vehicle trips in Metro Vancouver. If the latter was also an objective of the revenue tool, the extent to which this may have been achieved has yet to be determined.

References

TransLink sources:

- TransLink Tax Bulletin 105 – Motor Vehicle Tax
http://www.translink.ca/~media/documents/about_translink/parking_tax/105%20motor%20vehicle%20parking.ashx
- TransLink 2012 Base Plan and Outlook:
http://www.translink.ca/~media/Documents/bpotp/plans/10_year_plan/2012_Plans/2012_Base_Plan_and_Outlook.ashx
- 2009 and 2010 TransLink Annual Reports

News articles:

- <http://www.canada.com/vancouver/news/business/story.html?id=237a8d96-6856-40a5-9746-3703bf19d4a7>
- <http://www.metronews.ca/vancouver/local/article/416680--businesses-take-aim-at-transplant-parking-tax-hike>
- <http://www.canada.com/vancouver/news/story.html?id=8ca586da-c337-4696-9c0a-ac386180a0f8&k=40296>
- <http://www.cbc.ca/news/canada/british-columbia/story/2009/06/28/bc-colliers-parking-survey-vancouver-rates.html>
- <http://www.vancouver.sun.com/business/Vancouver+parking+rates+fourth+most+expensive+Canada+thanks/5098623/story.html>

Other:

- www.vtpi.org/parking_tax.pdf
- <http://www.driveoutthetax.com/>
- http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/221_2010#part3

¹ Following a referendum in August 2011, HST will no longer be applied in British Columbia after March 2013