VICTORIA Transport Policy INSTITUTE
EFFICIENCY • EQUITY • CLARITY

www.vtpi.org
Info@vtpi.org
250-508-5150

Local Funding Options for Public Transportation

8 March 2024

By
Todd Litman
Victoria Transport Policy Institute

Abstract

This report evaluates eighteen potential local funding options suitable to help finance public transit or other transportation projects and services. They are evaluated according to eight criteria, including potential revenue, predictability and sustainability, horizontal and vertical equity, travel impacts, strategic development objectives, public acceptance and ease of implementation. This is a somewhat larger set of options and more detailed and systematic evaluation than most previous studies. This research identified no new options that are particularly cost effective and easy to implement; each has disadvantages and constraints. As a result, its overall conclusion is that a variety of funding options should be used to help finance the local share of transportation improvements to ensure stability and distribute costs broadly.

A summary version of this report was published as:

"Evaluating Public Transportation Local Funding Options," *Journal of Public Transportation*, Vol. 17, No. 1, 2014, pp. 43-74

Contents

Introduction
High quality public transit can provide many economic, social and environmental benefits, including direct user benefits and various indirect and external benefits. Residents of communities with high quality transit tend to own fewer motor vehicles, drive less, and spend less on transport than they would in more automobile-oriented locations. Governments and businesses can save on roadway and parking facility costs. It can support economic development. Appropriate public transit investments can provide positive economic returns: under favorable conditions transit investments can provide savings and benefits that more than offset costs (Litman 2010). As a result, public transit service improvements are an important component of many jurisdictions' strategic transport plans (Buehler and Pucher 2010; ITF 2024).

Dedicated fuel taxes and vehicle fees finance highway programs, developers are required to build vehicle parking facilities, and freight provides good profits to most railroads; public transportation lacks such reliable funding options (Yusuf 2016). Although federal and state/provincial funds often help finance transit improvements, additional local funding is generally needed. Several previous studies identify and evaluate potential funding options for transport (AASHTO 2014; Freemark and Rennert 2023; Huang, et al 2010; Sakamoto 2010; Reich, Davis and Sneath 2012) and public transit (DeGood 2012; HDR 2015; IPIRG 2007; Pula, Shinkle and Rall 2015; Smith and Gihring 2015; TBoT 2010; TCRP 2009), but many only consider a limited set of options and evaluation criteria.

This report evaluates eighteen potential local funding options according to eight criteria, including potential revenue, predictability and sustainability, horizontal and vertical equity, travel impacts, strategic development objectives, public acceptance and ease of implementation. This is a somewhat larger set of options and evaluation criteria than considered in most previous studies. Much of this analysis can be applied to other types of transportation improvements besides public transit.

Literature Review
This section summarizes various publications on transportation and public transit funding options.

General Transportation Funding (not specific to transit)
Sustainable Urban Transport Financing from the Sidewalk to the Subway: Capital, Operations, and Maintenance Financing (Ardila-Gomez and Ortegon-Sanchez 2016) identifies an *underfunding trap* in which cities lack sustainable revenue to implement transportation improvements that will provide long-term savings and benefits. They evaluate 24 potential financing instruments based on their social, economic and environmental impacts, their ability to fund urban transport capital investments, operational expenses, and maintenance, and the "beneficiary pays" principle. They conclude that capital investments should be financed by a combination of grants from multiple levels of government, loans, public private partnerships repaid by user fees, and property taxes.

Transportation Revenue Options: Infrastructure, Emissions, and Congestion (Huang, et al 2010), summarizes results of an expert workshop on transportation funding. It considers three main funding categories: fuel taxes, congestion fees and VMT fees. It explores the financial and environmental advantages and disadvantages of each option and discusses various policy issues. It highlights the additional benefits of road tolls and vehicle-travel fees which can reduce traffic congestion and pollution emissions, in addition to raising revenues.

Financing Sustainable Urban Transport (Sakamoto 2010) provides guidance on urban transport finance, particularly in developing countries. It evaluates various funding options based on administrative levels, potential revenues, efficiency, equity, environmental objectives, stability, political acceptability and administrative ease. It also provides numerous examples and case studies from around the world.

Florida MPOAC Transportation Revenue Study (Reich, Davis and Sneath 2012) summarizes a detailed study which analyzed key state transportation funding issues, identified and evaluated potential sustainable funding sources. It recommends dedicated sales taxes, increased diesel taxes, gradually increase gasoline taxes and index them to inflation, redirect motor vehicle license and title fees to the state transportation funds, and conduct a study of VMT fees for possible future implementation.

Innovative Infrastructure Financing Mechanisms for Smart Growth (Tomalty 2007) describes and evaluates infrastructure (including but not limited to public transit improvements) funding options that support smart growth development. It includes examples from various cities. These include:

High Occupancy/Toll Lanes
Sector and Density Gradient Approach to Development Cost Charges
Parking Site Tax
Land Value Taxation
Standard Offer Contract
Storm Water Utility Fee Credits
TOD Policy Leveraging
Fuel Tax Transfer
Tax Increment Financing
Tax Base Sharing
Vehicle Registration Surcharges
Commuter Tax
Tax-Exempt Tax Revenue Bonds
Local Option Sales Tax
Grant Anticipation Revenue Vehicles

Transit Funding Studies

Local and Regional Funding Mechanisms for Public Transportation and its online *Regional Funding Database* (TCRP 2009) provides an extensive list of local and regional funding sources that are or could be used to support public transportation, plus guidance on factors to consider when evaluating and implementing these options. Table 1 summarizes the options identified. It evaluates based on revenue yield (adequacy and stability), cost efficiency, equity across demographic and income groups, degree to which beneficiaries pay, political and popular acceptability, and technical feasibility.

Table 1 **U.S. Local and Regional Public Transport Funding Options** (TCRP 2009)

Traditional Tax- and Fee-Based Transit Funding Sources	Common Business, Activity, and Related Funding Sources	Revenue Streams from Projects (Transportation and Others)	New "User" or "Market-Based" Funding Sources
General revenues Sales taxes (variable base of goods and services, motor fuels) Property taxes (real property, includes vehicles) Contract or purchase-of-service revenues (by public agencies and private organizations, etc.) Lease revenues Vehicle fees (title, registration, tags, inspection) Advertising revenues Concessions revenues	Employer/payroll taxes Vehicle rental and lease fees Parking fees Realty transfer tax and mortgage recording fees Corporate franchise taxes Room/occupancy taxes Business license fees Utility fees/taxes Income taxes Donations Other business taxes	Transit-oriented development/joint development Value capture/beneficiary charges Special assessment districts Community improvement districts/community facilities districts Impact fees Tax-increment financing districts Right-of-way leasing	Tolling (fixed, variable, and dynamic; bridge and roadway) Congestion pricing Emissions fees VMT fees

Various potential funding options are described in a Transit Cooperative Research Program (TCRP) report.

Steer Davies Gleave (2016) compiled a list of potential local public transit funding options including Tax Incremental Financing, Developer Funding, Asset Exploitation, Residential Value Capture, Employee Parking Levies, and Municipal Bonds. It provides case studies including Oxford Station, Hurontario LRT and Greater Manchester. AECOM (2012) provides critical analysis of both successful and unsuccessful transport funding programs, including congestion tolls, payroll taxes, parking taxes, HOT lanes, sale and fuel taxes, and tax increment financing. Table 2 summarizes current local public transit funding sources for various size U.S. cities.

Table 2 **U.S. Local Public Transportation Funding By System Size** (TCRP 2009)

Funding Source	Percent Capital Investment			Percent Operating Expenses		
City population	> 1m	200k to 1 m.	50k to 200k	> 1m	200k to 1 m.	50k to 200k
Fares and Earned Income	–	–	–	58.2%	30.2%	37.8%
Sales taxes	35.5%	38.9%	51.1%	18.8%	25.8%	28.3%
Other directly generated local funds	33.7%	–	–	–	–	–
Local general funds	–	42.5%	32.7%	11.1%	26.9%	21.3%
Other Local Dedicated Funds	18.4%	–	–	–	–	–
Local Property Taxes	–	–	9.7%	–	–	–
Other local sources	–	8.2%				

Note: dashes indicate minor contribution.

The *Guide to Transportation Funding Options* (UTCM 2010), by the Texas Transportation Institute University Transportation Center for Mobility describes the following transit funding options:

General fund expenditures	Tollway revenues	Realty/mortgage transfer fees
Vehicle registration fees	Cigarette tax	Corporate franchise taxes
Employer/payroll taxes	Parking fees and fines	Hotel/motel taxes
Concessions	Property taxes	Utility fees
General sales taxes	Fares and fair related income	Public Private Partnerships (PPP)
Lottery and/or casino revenues	Contracts or purchase of service	Tax-increment Financing Districts
Vehicle leasing and rental fees	Lease revenues	Transportation Development Districts
Advertising	Concessions/rental income	

Primer on Transit Funding (APTA 2012) describes U.S. transit funding sources including federal and state grant programs, general funds, fuel taxes, rental car sales taxes, vehicle registration fees (levies), bond proceeds, sales tax, and interest income. *Financing Capital Investment: A Primer for the Transit Practitioner* (Transtech Management 2003), identifies and evaluates transit capital project financing options, primarily U.S. federal and state grants, and borrowing strategies, but also new revenue options. TransLink, the Vancouver, Canada regional transportation agency, is evaluating new funding options (Cayo 2012). Table 3 summarizes the options identified.

Table 3 **Potential Translink Funding Options** (TransLink 2012)

User Fees and Taxes	Beneficiary Fees	Other Taxes and Financing Tools	Direct Government Grants
Transit fares Gas taxes Road and parking pricing Transportation Improvement Fee Vehicle-km travelled fee Flat levy (e.g. Hydro Levy)	Land value capture levy Property tax Employer/Payroll tax Development charges	Carbon tax Debt instruments Regional sales tax Vehicle sales tax	Provincial grant program Federal grants Federal-provincial national transit strategy program Social service

This table summarizes options for funding Vancouver region transportation improvements.

The report, *Sustainable Urban Transport Financing from the Sidewalk to the Subway : Capital, Operations, and Maintenance Financing* (Ardila-Gomez and Ortegon-Sanchez 2016), published by the World Bank, evaluates 24 potential urban transportation funding options in terms of their advantages, disadvantages and fairness (beneficiaries pay). The table below summarizes these options.

Table 4 **Potential Funding Options** (Ardila-Gomez and Ortegon-Sanchez 2016)

General benefit instruments	Direct benefit instruments	Indirect benefit instruments
General public beneficiaries	*Direct Beneficiaries (users, drivers, passengers)*	*Indirect beneficiaries (firms, land and property owners, developers)*
• Public transport subsidies Property taxes • National and international grants and loans • Climate-related financial instruments • Global Environment Facility (GEF) • Clean Technology Fund • Clean Development Mechanism (CDM) • Public–Private Partnerships (PPPs) for public transport	• Parking charges • Road pricing • Congestion charges • Fuel taxes and surcharges • Vehicle taxation • Farebox revenue • PPPs for urban roads	• Advertising • Employer contributions • Added value capture mechanisms • Land-value taxes/betterment levies • Tax increment financing • Special assessment • Transportation utility fees • Land asset management • Developer exactions • Development impact fees • Negotiated exactions • Joint developments • Air rights

This table evaluates various urban transportation funding options in terms of beneficiaries.

Finding Solutions to Fund Transit: Combining Accountability & New Resources For World-Class Public Transportation (IPIRG 2007) identified and evaluated various public transit funding options and evaluated them according to seven principles: market efficiency, low collection costs, reliability, diversity, "fare increases are self-defeating," budget accountability and community participation. It evaluates general sales taxes, dedicated gasoline taxes, car rental taxes, registration fees, tire taxes, weight-based vehicle registration fees, vehicle battery taxes, weigh-mile truck fees, road tolls, development impact fees, stormwater fees, real estate transfer taxes and parking taxes.

Surmounting the Fiscal Cliff Identifying Stable Funding Solutions for Public Transportation Systems (Freemark and Rennert (2023) examines the fiscal problems facing U.S. public transit agencies, particularly as a result of the COVID pandemic, and ways to address them through more diverse funding options (sales taxes, property taxes, income taxes, plus driving and parking fees), strategies to increase ridership and revenues, and service efficiencies.

Thinking Outside the Farebox: Creative Approaches to Financing Transit Projects (DeGood 2012) discussed various benefits from high quality public transport, and provides guidance on ways to finance transit improvements in the U.S. funding options, including various federal and state grants, bonds and loan programs, plus local funding options, particularly dedicated funds from general sales and property taxes. It evaluates local funding options based on their potential revenue, reliability, equity and political feasibility. These include:

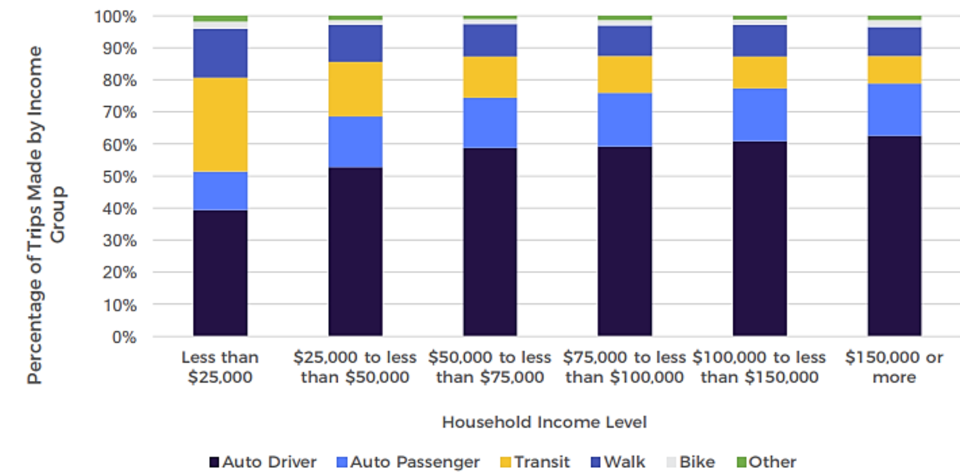
- Tax Increment
- Special Assessment District
- Development Contributions
- Sales Tax
- Road tolls
- Vehicle Registration Tax
- Parking Fees
- Fuel Taxes
- Land Sales

Financing Transit Systems Through Value Capture: An Annotated Bibliography (Smith and Gihring 2015) summarizes the findings of numerous studies concerning the impacts transit service has on nearby property values, and the feasibility of capturing a portion of the incremental value to finance transit improvements.

The report, *What Do Americans Think about Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year Five of a National Survey* (Weinstein Agrawal and Nixon 2015) found that most survey respondents want good public transit service in their communities and nearly two-thirds support spending gas tax revenues on transit, but few support raising gas tax or transit fares, and few respondents are well-informed about how transit is funded, with only half knowing that fares do not cover the full cost of transit.

The Vancouver, Canada region's *Mobility Pricing Independent Commission* (2017), comprised of 14 community leaders, is using stakeholders engagement and detailed analysis of transport trends and costs by income class to evaluate the travel impacts and social equity effects of various decongestion fees and investment options. The results will be used to develop recommendations transportation pricing and congestion reduction policies.

Figure 1 **2011 Primary trip mode by household income level** (MPIC 2017)



Automobile mode share, annual vehicle travel and peak-period trips tend to increase with income. Lowest income seldom drive during peak periods. This indicates that road user fees and congestion pricing are less regressive than financing roads and parking through general taxes or through building rents.

The Move Ahead: Funding "The Big Move" (TBoT 2010) describes and evaluates potential options for funding The Big Move, a 25-year, $50 billion regional transportation infrastructure program. Each option is evaluated based on technical feasibility, projected revenue generation, predictability, sustainability and durability of the revenue, administrative cost and complexity, impact on consumer behavior (i.e. extent that they reduce peak-period trips), and social equity and fairness. The report, *Making the Move: Choices and Consequences* (TISAP 2013) evaluates potential benefits from transit investments, evaluates potential funding options, and recommends various funding packages (including increased fuel and corporate taxes, and dedication of sales taxes), plus various implementation strategies to insure that investments maximize benefits and gain public support.

Putting Wheels on the Bus: Unlocking the Potential of Public Transit in Canada to Cut Carbon Emissions (ED & Équiterre 2024) argues that federal and provincial governments should provide options for long term, reliable operating funding for public transit. It suggest that the federal government should provide 40% of the additional funding required to achieve transportation and emission reduction targets.

Table 5 **Summary of Toronto Revenue Options Analysis** (Irwin and Bevan 2010)

Source	Net Revenue	Basis of Estimate	Policy Advantages	Implementation Issues
1. Tolls on major roadways	$1 – 2 B/year	10 – 20 ¢/km	Relieves congestion and reduces road expansion costs. Revenue grows with demand. Encourages transit use.	Traffic diversion concerns. "Double taxation" concerns. Much better transit required first. Social equity concerns.
2. Regional gas/diesel fuel tax	$1 – 2 B/year	10 – 20 ¢/litre	Can marginally reduce auto use but not focusing on hot spots. Encourages energy-efficient, and transit use. Easy to administer.	Sales leakage to nearby areas. Declines as fuel-efficiency increases. Best introduced when gas prices are low.
3. Commercial parking levy	$1 – 2 B/year	$1.00 – 2.00/day per space	Reduces auto use to commercial areas. Encourages more use of transit and active transportation Administratively straightforward	Employment leakage to surrounding areas. A version, the Commercial Concentration Tax, was previously rejected.
4. Regional sales tax	$1 – 2 B/year	1 – 2% in addition to the HST	Administratively stable, reliable source	No direct incentive for more sustainable travel. Sales leakage. Political opposition.
5. High Occupancy Toll (HOT) lanes or express lanes on GTHA freeways	$400 –800 M/yr. for Express Lanes $200 – 400 M/yr. for HOT Lanes	10 – 20¢/km for single-occupant vehicles (HOT Lanes) or for all vehicles (Express Lanes)	Encourages car-pooling. Increases person-carrying capacity and average speed on major highways.	Relatively small revenue versus infrastructure and enforcement costs
6.Dedciate a portion of gas/diesel HST revenue to GTHA transit	$400 – 600 M/year	May 2010 report of $895 M additional gas tax revenue anticipated from 2010/11 HST	Same as above for Regional Gas/Diesel Fuel tax. Would be timely if dedicated as of July 1, 2010 or shortly thereafter.	As above except province wide application of HST avoids fuel sales leakage to surrounding areas
7. Congestion levy on private vehicles entering central area during peak periods	$250 – $500 M/yr	$5 – 10/vehicle entry-charge at cordon	Reduces Central Area Congestion. Encourages more use of transit and active transportation. Improves mobility in Central Area	May reduce Central Area employment. Congestion & parking spillover. Implemen-tation and enforcement costs.
8. Vehicle registration fee (varies with vehicle GHG emission levels)	$200 – 400 M/year	$100 – 200/year per vehicle	Stable, reliable source. Encourages low-emission vehicles. Easy to administer	Does not moderate amount of use of the vehicle
9. Value capture levy (higher property taxes in areas served by high quality transit)	$50 – 100 M/year	N/A	Encourages compact development and increased transit use. May reduce land speculation. Easy to administer	Uncertainty in estimating value increases. Higher rents. May force out small business and low income residents
10. Utility bill levy	$50 – 100 M/year	$20 – 40/year per household	Stable, reliable source. Easy to administer	No direct incentive for more sustainable driver behaviour
11. Employer payroll tax in areas within walking distance of rapid transit	$40 – $80 M/year	$100 – 200/year per full time employee	Stable, reliable source. Partially borne by incoming workers who benefit from improved transit. Administratively straightforward	Higher costs, potential loss of jobs in taxation zones. Benefits to local employees may not compensate for lower wages.
12. Additional federal funding (national transit strategy)	$1 – 2 B/year	25 – 50% of transit capital costs 25 – 50% of net transit operating costs	Administratively straightforward. Provides relatively reliable funding plus a stable policy framework from the federal and provincial governments	Difficult in context of large federal/provincial deficits. Could stop, as in 1998. No direct incentive for more sustainable transport activity.

This table summarizes options for funding Toronto region transportation improvements.

Evaluation Criteria

This section describes the eight criteria used to evaluate funding options.

Potential Revenue

This refers to the amount of money that an option can be expected to generate, based on various assumption about how it is implemented. Some funding options have natural constraints, for example, there are limits to the amount of money transit agencies can generate through advertizing and station rents, but in most cases maximum potential revenues reflect assumptions about how an option is implemented and what is politically acceptable.

Predictability and Stability

Funding predictability and stability are desirable for planning and budgeting purposes. Some funding options fluctuate from year-to-year, while others are more predictable and stable. These evaluations are based on a general understanding of funding options, which may be modified in a particular situation. For example, sales tax revenues may be more predictable and stable in areas with diversified retail markets than where markets are more specialized.

Equity Analysis

One of the most common issues raised in public consultations is a desire that transport funding be *equitable*, that is, the distribution of costs and benefits should be considered fair and appropriate. Transport equity can be defined and measured in various ways that may lead to different conclusions concerning what is equitable (Litman 2002). There are two major categories:

- *Horizontal equity* refers to the distribution of impacts between people with similar wealth, needs and abilities. It assumes that similar people should generally be treated equally, and implies that people should "get what they pay for and pay for what they get" unless subsidies are specifically justified.
- *Vertical equity* refers to the distribution of impacts between people who differ in wealth, ability or need. It generally assumes that costs should be smaller and benefits greater for people who are physically, economically or socially disadvantaged. Policies that do this are called *progressive* and those that impose higher costs on disadvantaged people are called *regressive*.

Equity analysis can consider various types of impacts, and group people in various ways. For example, road pricing is generally considered regressive, since a given toll represents a larger portion of income to lower-income than to higher income motorists. However, lower-income people tend to drive less than wealthier people, particularly on major urban highways that are candidates for tolling, and rely more on alternative modes. As a result, road pricing tends to be less regressive than other roadway funding options (such as general taxes), and may be progressive overall if it leads to improvements to alternative modes, such as faster bus service, or increased cycling facility investments (Schweitzer and Taylor 2008). Transit fares can be structured to achieve horizontal and vertical equity goals (Lotshaw and Hovenkotter 2019)

Horizontal equity requires that program costs be borne by beneficiaries. Public transit service improvements can provide various benefits to users (called *internal* benefits) and non-users (called *external* benefits). Some benefits result from the service improvements themselves, others only result if they reduce automobile travel or stimulate more compact development (Banister and Thurstain-Goodwin 2011; CTOD 2011; Litman 2011; EDRG 2007). These include benefits to:

- Transit users from improved convenience and comfort, financial savings, increased safety, and improved public fitness and health.

- Motorists from reduced traffic and parking congestion, improved mobility for non-drivers which reduces chauffeuring burdens, improved traffic safety, and emission reductions.
- Taxpayer from road and parking facility cost savings, improved safety, and increased public health.
- Businesses from congestion reductions, parking cost savings, improved employee safety and fitness, and because high quality transit tends to support regional economic development.
- Benefits to residents (regardless of how they travel), including parking cost savings, improved mobility for non-drivers, increased safety, reduced pollution and improved public fitness.

Table 6 summarizes the distribution (also called the *incidence*) of transit benefits. Some are concentrated, benefiting certain people, businesses and jurisdictions. Others are more widely dispersed. Most people and businesses experience some savings and benefits. Under favorable conditions, high quality transit can provide financial savings and economic benefits that offset costs, providing positive return on investments (Litman 2010). This suggests that various funding sources can be justified on a beneficiary-pays basis, including funding from people who do not currently use public transit but gain savings and benefits.

Table 6 **Distribution of Transit Benefits**

	Transit Users	Motorists	Taxpayers	Businesses	Residents
Improved convenience and comfort	✓				
Congestion reductions		✓		✓	
Roadway cost savings			✓		
Parking cost savings	✓		✓	✓	✓
User savings and affordability	✓				
Improved mobility for non-drivers	✓	✓			✓
Improved traffic safety	✓	✓	✓	✓	✓
Energy conservation	✓				
Emission reductions		✓			✓
Improved public health	✓		✓	✓	✓

High quality public transport can provide a variety of widely distributed benefits.

Travel Impacts
This refers to the effects an option has on how and how much people travel, and whether this supports or contradicts strategic transport planning objectives, such as objectives to reduced automobile travel and increased use of alternative modes. These are estimated based on our understanding of price impacts on travel activity.

Strategic Development Objectives
This refers to the effects an option has on the type and location of development in a community, and whether this supports or contradicts strategic planning objectives such as objectives to encourage more compact, accessible development and discourage sprawl. These are estimated based on our understanding of tax and price impacts on development patterns.

Public Acceptability
Another important issue for this analysis is the degree of public acceptability of each funding option (Agrawal 2015; Weinstein and Nixon 2015). The Victoria transit funding research project included surveys and focus groups that investigated public preferences concerning funding options (Earthvoice Strategies 2012; Quay Communications 2012). Such preferences can vary significantly depending on the group surveyed, existing tax

conditions, and exactly how funding options are designed and implemented. For example, the public acceptability of a fuel tax increase may depend on existing fuel tax levels, when they were last raised, and exactly how revenues are used. Although past experiences can provide useful guidance for future studies and surveys, the results are not necessarily transferable to other times and places.

Ease of Implementation

This refers to a revenue option's *transition* (initial implementation) and *transaction* (ongoing collection) costs. These are estimated based on assumptions about how it will be implemented and what is required to do this.

There are other possible factors to consider. For example, some researchers have argued that external subsidies encourage transit system operators to be less efficient, however, the study, "Operating Subsidies and Transit Efficiency: Applying New Metrics to Old Problems" (Funk, Higgins and Newmark 2023) found that performance efficiency indicators (per capita transit ridership and cost recover) actually increase with subsidies indicating that properly-designed external funding can increase overall system efficiency.

Analysis

This section describes and evaluates eighteen potential public transit funding options.

Fare Increases

In most urban transit systems, current adult fares average $2 to $3 per trip or $50 to $80 for a monthly pass, with discounted (*concession*) fares for youths, seniors and people with disabilities. It is possible to increase all fares, selected categories, or change price structures, for example, to include higher fares for longer-distance trips or for special services such as light rail or express commuter buses.

Potential Revenue

The price elasticity of transit ridership with respect to fares is usually –0.2 to –0.5 in the short run (first year), and increases to –0.6 to –0.9 over the long run (five to ten years) (Litman 2004b; McCollom and Pratt 2004; Wardman and Shires 2011). This suggests that a 10% fare increase typically increases revenue 5-8% over the short run and 1-4% over the long-run. As a result, rising fare increases revenue, but less than proportionately (raising fares 10% provides less than 10% increased revenue), and revenue gains tend to decline over time. These impacts tend to vary depending on the types of riders and types of services. Transit dependent users and peak period travel tend to be less price-sensitive than discretionary travelers (people who could travel by automobile) and off-peak travel.

Predictability and Stability

As previously described, the additional revenues from fare increases can be difficult to predict with precision and tend to decline over time.

Horizontal Equity

Since transit services are subsidized, fare increases can be considered horizontally equitable (users pay for the services they receive). However, automobile travel imposes significant external costs, particularly under urban-peak travel conditions, including road and parking subsidies, traffic congestion, accident risks and pollution damages imposed on others (Litman 2009; TC 2008). Under urban-peak travel conditions, transit subsidies are often smaller than the subsidies that would be required to accommodate additional automobile travel on the same corridor. Described differently, to the degree that shifting travel from automobile to public transport is considered a sacrifice that benefits other people, fare increases can be considered horizontally inequitable because they double-charge transit users.

Vertical Equity

Since public transit provides basic mobility and many users are lower-income, fare increases tend to be regressive and vertically inequitable. This regressivity varies depending on specific factors, such as transit user incomes and price structures.

Travel Impacts

Fare increases tend to reduce public transit travel and shift travel to automobile (Litman 2004b; McCollom and Pratt 2004; Wardman and Shires 2011). They therefore tend to contradict planning objectives to reduce automobile travel.

Strategic Development Objectives

Transit fare increases may reduce the relative attractiveness of transit-oriented locations, such as downtowns and transit station areas.

Public Acceptance
Although there is general support for the user pay principle, surveys and focus groups indicate opposition to significant fare increases due to vertical equity concerns (a desire to keep public transit affordable to lower-income users), and a desire to encourage public transit travel.

Ease of Implementation
Fare increases are easy to implement.

Legal Status
Most public transit agencies or local governments have the legal ability to increase fares.

Examples
Most transit agencies regularly increase fares. The report, *A Fare Framework: How Transit Agencies Can Set Fare Policy Based on Strategic Goals* (Lotshaw and Hovenkotter 2019) describes how transit fares can be structured to achieve equity objectives.

Discounted Bulk Transit Passes

Public transit agencies can sell transit passes to a group, such as all students at a college or university, all employees at a worksite or all residents of a neighborhood. They are often designed to be revenue neutral - the additional transit service costs are at least offset by the additional revenues. For example, if standard monthly passes are priced at $80 and used for 40 average monthly trips, the transit agency can sell $40 discounted passes to a group of students that average 20 monthly trips or $20 to a group of residents that average 10 monthly trips.

Potential Revenue

Potential revenues depend on the scope of these programs, which could add hundreds, thousands or tens of thousands of new users. However, this also tends to increase transit service costs.

Predictability and Stability

Contracts for such services tend to be for one or more years, so transit agencies can generally plan for the additional revenue and ridership on an annual basis.

Horizontal Equity

Such passes tend to create cross-subsidies from those participants who seldom or never ride transit to those who ride more than average, although they may benefit from reduced congestion and accident risk.

Vertical Equity

Since physically and economically disadvantaged people tend to ride transit more than average and benefit most from financial savings, and since such programs tend to increase total transit service (for example, allowing increased frequency), this strategy tends to support vertical equity objectives.

Travel Impacts

This tends to increase transit ridership and reduced automobile travel, although impacts will vary depending on specific circumstances.

Strategic Development Objectives

This can increase the attractiveness of transit-oriented locations.

Public Acceptance

There is often high public acceptance of such programs, since they make transit more affordable and encourage transit ridership. U-Pass programs often receive high levels of student support, but neighborhood programs tend to receive less.

Ease of Implementation

Once a price structure is established implementation is relatively easy.

Legal Status

Most transit agencies have the legal ability to negotiate discounted fares for particular groups.

Examples

Many colleges and universities have U-Pass programs which provide transit passes to all students and sometimes staff at a campus (Brown, Hess and Shoup 2003). TransLink's *Employer Pass Program* offers a 15% discount to transit passes purchased through employers. Boulder, Colorado offers such a pass to residential neighborhoods, called the *Neighborhood Eco Pass* (Boulder 2013).

Property Taxes

Most municipal governments collect property taxes. In many jurisdictions a portion of property taxes are dedicated to public transit.

Potential Revenue

It is possible to increase property taxes by virtually any amount, but large tax increases are politically difficult and there are many demands on these tax revenues.

Predictability and Stability

Property taxes are relatively stable.

Horizontal Equity

To the degree that public transit improvements increase nearby property values or provide other savings and benefits to nearby residents and businesses (congestion reductions, parking cost savings, household savings, emission reductions, etc.), property tax funding can be considered horizontally equitable.

Vertical Equity

Property ownership tends to increase with income, and lower-income residents tend to qualify for various property tax discounts and exemptions, so this tax tends to be relatively progressive with respect to income. However, even poor people bear a portion of these taxes through rents, and property taxes are burdensome to some lower-income home owners.

Travel Impacts

Property taxes have few direct travel impacts.

Strategic Development Objectives

Large property tax differences may cause development to shift between jurisdictions, but transit taxes are relatively small and usually applied region-wide so impacts are likely to be minimal.

Public Acceptance

Although property taxes are widely used to finance public transit, and tend to be considered a default funding source (the source used if other options are infeasible), there may be resistance to significant increases in this tax.

Ease of Implementation

Since transit property taxes are already collected in most jurisdictions they are relatively easy to increase.

Legal Status

In some jurisdictions, state/provincial legislation or voter approval is required to raise property tax rates.

Examples

Many transit agencies rely on property taxes (TCRP 2009; UTCM 2010).

Regional Sales Taxes

Many jurisdictions (particularly in the U.S.) rely significantly on sales taxes to finance public transit. Variations include special taxes on particular transactions such as hotel room and vehicle rentals.

Potential Revenue

A regional general sales tax could generate virtually any amount of revenue. Revenues from taxes on sales of particular products tend to be modest.

Predictability and Stability

Moderately stable. Sales taxes tend to fluctuate more than property taxes.

Horizontal Equity

To the degree that public transit benefits consumers, sales taxes can be considered horizontally equitable, although the relationship is indirect (people and businesses that benefit most do not necessarily pay more sales taxes).

Vertical Equity

Sales taxes are regressive, and so tend to be vertically inequitable.

Travel Impacts

Sales taxes do not directly affect travel activity.

Strategic Development Objectives

Large sales tax differences may cause development to shift between jurisdictions, but transit taxes are relatively small and usually applied region-wide so impacts are likely to be minimal.

Public Acceptance

Mixed. Although there tends to be opposition to most tax increases, sales taxes are among the most often applied to fund transportation programs, including public transit improvements indicating a moderate degree of public acceptance.

Ease of Implementation

In jurisdictions that already apply sales taxes, there is minimal cost to increasing such taxes to fund public transit. Where no sales taxes is currently applied, implementation costs would be moderate.

Legal Status

In many jurisdictions, state/provincial legislation or voter approval is required to raise sales tax rates.

Examples

Sales taxes are the most common dedicated source of transit funding in the U.S. (IPIRG 2007). According to the Federal Transit Administration's *National Transit Database*, after federal funds, sales taxes comprised the largest source of revenues for capital spending (38%) and the second largest source of operating expenses (27%) after fares (32%). In November 2016, 71% of Los Angeles County voters approved *Measure M* (http://theplan.metro.net) a 0.5% sales tax increase to generate $870 million annually to expand transit and bike networks. The agency produced a report, *LA County's Measure M Lessons Learned* (METRO 2017), which provides advice for building public support for such a program.

Income Taxes

An additional tax on income, dedicated to public transportation.

Potential Revenue

This tax can generate virtually any amount of revenue.

Predictability and Stability

This tax tends to be relatively predicable and stable

Horizontal Equity

To the degree that all residents benefit from public transit, it can be considered equitable, but since higher income households pay more but tend to use public transit less than lower income households, it may be considered unfair. This could be considered an equitable tax for funding higher quality transit services, such as commuter rail, since higher income residents are more likely to use such services.

Vertical Equity

Income taxes are generally considered among the most progressive (vertically equitable) tax options.

Travel Impacts

Income taxes do not generally affect travel activity.

Strategic Development Objectives

Income taxes do not generally affect development patterns unless they are high enough to encourage some households to move outside the urban boundaries.

Public Acceptance

Income taxes have mixed public acceptance.

Ease of Implementation

Implementation is relatively easy and in jurisdictions where income taxes are already collected, but may require significant new administrative effort if there is no existing system.

Legal Status

The ability of individual jurisdictions to collect income taxes varies widely.

Examples

In 2016, Indianapolis Region voters approved a referendum that authorizes the city to impose an income tax of up to 0.25 percent—25 cents per $100 of income—to help fund the Marion County Transit Plan. For a resident earning $50,000 a year, that 0.25 percent equals an additional $125 in annual income taxes (Orr 2016). The plan calls for $390 million in improvements to improve reginal bus service—extending hours of operation, increasing the number of bus routes that run at 15-minute frequencies, plus the operational costs of three Bus Rapid Transit lines.

The City of Cincinnati (2016) levies a two percent (2%) per annum tax on municipal taxable income to finance general municipal operations, maintenance, new and facilities and other capital improvements, including public transit services.

Fuel Taxes

Special fuel tax can be collected in a jurisdiction to fund public transit. In some cases a portion of existing fuel tax revenue is dedicated to public transit programs without increasing fuel tax rates.

Potential Revenue

Assuming residents average 500 gallons of annual fuel consumption, each cent per gallon of taxes generates $5 per capita. Although fuel price increases reduce demand (a 10% price increase typically reduces fuel consumption 2-4% in the medium-run), a few cents per gallon to fund transit generally have minimal impact (Litman 2013; Wardman and Shires 2011).

Predictability and Stability

Fuel tax revenue is moderately stable. It tends to fluctuate more than property taxes.

Horizontal Equity

To the degree that motorists benefit from public transit improvements, due to reduced traffic and parking congestion, and reduced need to chauffeur non-drivers, and to the degree that automobile travel imposes external costs on non-drivers, fuel taxes can be considered to increase horizontal equity.

Vertical Equity

Fuel taxes are regressive, but this regressivity is reduced if public transit improvements provide more convenient and affordable alternative to driving. Described differently, of all possible fuel tax uses, transit improvements are relatively progressive if they improve affordable mobility options.

Travel Impacts

Fuel tax increases tend to reduce automobile travel and encourage use of alternative modes, although typical transit funding taxes are small and so would have minimal impact. Travel impacts depend on whether the transit tax is in addition to, or a portion of, existing fuel taxes.

Strategic Development Objectives

Fuel tax increases tend to encourage more compact, multi-modal land development, although the effects of this are likely to be minimal.

Public Acceptance

In general, fuel tax increases tend to be unpopular. However, surveys and focus groups indicate moderate support to fuel tax increases that are dedicated to transportation improvements.

Ease of Implementation

Implementation is relatively easy and in jurisdictions where fuel taxes are already collected.

Legal Status

Fuel tax increases often require state or provincial approval.

Examples

At least twelve U.S. states have local option transit gasoline taxes (TCRP 2009). Such taxes are common in Canada. In Metro Vancouver, 15¢ per litre fuel tax is dedicated to transit. In Ontario, two cents per litre of the provincial gas tax is devoted to public transit, and Calgary and Edmonton receive 5¢ of the provincial gas tax collected in each city for road and transit funding (TBoT 2010).

Vehicle Levy
An additional fee for registering vehicles in the region.

Potential Revenue
Although vehicle levies can be any size, most are $20-60 annual per vehicle, only a portion of which is dedicated to public transit, so their total transit revenue is small to moderate. High levies can motivate some motorists to register their vehicles in other jurisdictions.

Predictability and Stability
Stable.

Horizontal Equity
As previously discussed, to the degree that motorists benefit from public transit improvements, due to reduced traffic and parking congestion, and reduced need to chauffeur non-drivers, and to the degree that automobile travel imposes external costs on non-drivers, a vehicle levy can be considered to increase horizontal equity. However, since vehicle fees do not reflect use (fees are the same for vehicles driven high and low annual mileage), this fee poorly reflects the external costs imposed by a particular vehicle.

Vertical Equity
This fee tends to be regressive, particularly because lower-income motorists tend to drive their vehicles lower annual mileage and so pay more per kilometer than higher income motorists on average.

Travel Impacts
Higher vehicle fees may marginally reduce vehicle ownership and use, but impacts are likely to be small.

Strategic Development Objectives
No significant impacts.

Public Acceptance
According to survey and focus group responses, vehicle levies have less public acceptance than other transportation-related revenue options.

Ease of Implementation
Where vehicle registration fees are already collected an additional levy to fund transportation or public transit programs is easy to apply. Implementation costs are much higher if a special fee collection system must be established.

Legal Status
In most jurisdictions this would require state/provincial legislation and support.

Examples
In the United States, 33 states and 27 local jurisdictions have vehicle registration fees which help finance transportation improvements, which often includes public transport (IPIRG 2007). Toronto, Montreal, Quebec City, Gatineau, Trois-Rivières, Saguenay, Sherbrooke, and Saint-Jérome all use a vehicle registration fee to help finance public transport (TBoT 2010). In Montreal and Quebec City, $30 from the provincially-levied license/vehicle registration revenue is devoted to funding transit operations. Toronto collects $60 annually per vehicle registration.

Utility Levy
Apply a special transit levy to all utility accounts in the region.

Potential Revenue
Small. Although such a levy could be any size, they are usually $10-40 annual per meter, or $5-20 per capita.

Predictability and Stability
Stable.

Horizontal Equity
Similar to a property tax, a utility levy charges residents.

Vertical Equity
A utility levy is likely to be relatively regressive, since it is a flat fee per household.

Travel Impacts
No significant impacts.

Strategic Development Objectives
No significant impacts.

Public Acceptance
According to survey and focus group responses, utility levies have low public acceptance. It had the greatest level of opposition of all options presented.

Ease of Implementation
Relatively easy to implement.

Legal Status
Would generally require state/provincial legislation.

Examples (TCRP 2009)
Some jurisdictions have local government utility taxes. TransLink receives a hydro levy of $1.90 per month from each BC Hydro account within the service region. The hydro levy generates approximately $18 million per year in revenue (TBoT 2010).

Employee Levy
A levy paid by employers (often only larger employers) located in a transit service area.

Potential Revenue
Small to moderate potential revenues, depending on the number of employees covered and the level of the levy.

Predictability and Stability
Stable.

Horizontal Equity
Can be considered fair to the degree that commuters create traffic congestion and create demand for public transit.

Vertical Equity
The ultimate incidence of this fee is difficult to predict. It may substitute for wages, reduce total employment, or shift employment location if a large levy is applied just in the urban core.

Travel Impacts
Travel impacts are likely to be small.

Strategic Development Objectives
If applied only in an urban core it may discourage downtown employment and encourage sprawl.

Public Acceptance
Uncertain.

Ease of Implementation
Would probably involve moderate implementation costs, similar to other business taxes and fees.

Legal Status
May require state/provincial legislation.

Examples (TBoT 2010; TCRP 2009)
New Jersey imposes a “Corporate Transit Fee” which taxes businesses that earn more than $1 million in profits (Solomon 2024).

In France, the *Versement Transport* (Transport Levy) taxes employers with more than nine staff to help finance local public transport services. A special 0.6% payroll tax is collected from most employers in the Portland and Eugene Oregon regions to help finance public transport services.

Road Tolls (Decongestion Pricing)

Tolls are fees for driving on a particular road, bridge, or in a particular area. *Decongestion pricing* refers to tolls that are higher during peak periods to reduce traffic congestion. A variation is High Occupancy Tolls (HOT) lanes, which are free for use by high occupant vehicles (buses and carpools), but tolled for low-occupant vehicles.

Potential Revenue

Although revenues are theoretically large if widely applied, most proposals only toll a minor portion of roads and vehicle travel, resulting in modest total revenues.

Predictability and Stability

Once established, revenues would probably be moderately stable, but may decline over the long run as travelers take tolls into account when making longer-term decisions (such as where to live).

Horizontal Equity

Tolls are generally considered vertically equitable, because they charge users directly for the congestion and roadway costs they impose, but they are often criticized as unfair if only applied on a few roadways.

Vertical Equity

Tolls are often criticized as regressive, since a given toll represents a higher portion of income for poorer than wealthier motorists, but overall regressivity depends on the incomes of actual road users, the quality of travel options on that corridor, and how revenues are used. Tolls are often progressive compared with other funding options, such as using general taxes to finance roads and public transit services (Kitchen 2019).

Travel Impacts

Road tolls tend to reduce affected automobile travel, particularly if implemented with public transit improvements. Congestion pricing can be effective at reducing traffic congestion,

Strategic Development Objectives

Mixed. If applied only in central areas tolls may encourage more dispersed development, but if applied broadly and implemented with improvements to other modes, they may encourage compact development.

Public Acceptance

There is often public opposition to tolls, particularly on existing roadways, although surveys indicate some acceptance if revenues are used to support popular road and public transport improvements.

Ease of Implementation

Although there are many possible ways to implement road tolls, including new technologies that reduce costs, implementation tends to be expensive, particularly if implemented by a single region.

Legal Status

Road tolling usually requires state/provincial legislation.

Examples (TBoT 2010; TCRP 2009)

London, Singapore and Stockholm apply congestion tolls for driving on urban roads during peak periods (Wolfe 2019). In 2019 New York City approved the first US urban decongestion pricing program, which will charge motorists to enter the most congested parts of Manhattan (Hu 2019; Schaller 2018). It is expected to raise approximately $1bn annually. Although economists advocate this as a way to reduce traffic problems, much of its political support comes from its ability to finance public transit improvements.

Vehicle-Km Tax

A form of road pricing that charges motorists per kilometre travelled. Could vary by vehicle type, such as higher fees for higher polluting vehicles.

Potential Revenue

Potentially large.

Predictability and Stability

Moderate. Similar to fuel taxes.

Horizontal Equity

Similar to fuel taxes. To the degree that motorists benefit from public transit improvements, and to the degree that automobile travel imposes external costs on non-drivers, vehicle-kilometer fees can be considered to increase horizontal equity.

Vertical Equity

Is likely to be regressive. However, to the degree that public transit improvements reduce the need to drive, this regressivity is reduced.

Travel Impacts

Vehicle-kilometer fees tend to reduce automobile travel and encourage use of alternative modes, including public transit.

Strategic Development Objectives

Vehicle-kilometer fees tend to encourage more compact, multi-modal land development.

Public Acceptance

In general, vehicle-kilometer fees tend to be unpopular. However, survey and focus group responses indicate moderate support for this option.

Ease of Implementation

Has high implementation costs since it would require a special system to measure annual vehicle travel in a region.

Legal Status

Would generally require federal state or provincial legislation and support.

Examples (Huang, et al, 2010; TBoT 2010)

Vehicle-kilometer fees have been proposed in many jurisdictions, but so far have only been implemented for freight trucks in Germany. Since 2005, all trucks have been charged a VKT of €0.09 to €0.14 per kilometer based on the truck's emissions levels and number of axles.

Parking Sales Taxes
A special tax on parking transactions (when motorists pay directly for parking).

Potential Revenue
Small to moderate. Only a minor portion (probably 5-10%) of parking activity is priced. It could encourage more businesses to provide free parking to employees and customers.

Predictability and Stability
Moderate to low stability.

Horizontal Equity
As with other vehicle use fees, it can be considered horizontally equitable to the degree that transit improvements benefit motorists and to the degree that motor vehicle travel imposes external costs.

Vertical Equity
Since this fee only applies when parking is priced, it is probably less regressive than other vehicle fees.

Travel Impacts
By marginally increasing parking fees it may slightly reduce vehicle trips, but by increasing the value to users of parking subsidies and reducing commercial parking profitability, it may reduce the total portion of parking that is priced (Litman 2013; Wardman and Shire 2011).

Strategic Development Objectives
Because this fee primarily applies in downtowns and other major commercial centers, it may discourage compact development.

Public Acceptance
There is often public opposition to parking fees. Survey and focus group responses indicate moderate support for this option.

Ease of Implementation
Implementation costs are likely to be small to moderate. It may require new accounting requirements for commercial parking operators.

Legal Status
Requires provincial or state legislation and support.

Examples (Litman 2012; TBoT 2010)
Many U.S. jurisdictions levy a parking surcharge. Chicago, Illinois assesses a flat parking surcharge, rather than a percentage charge, on daily, weekly and monthly parking, with charges ranging from $0.75-$2 for daily parking, $3.75 to $10 for weekly and $15 to $40 for monthly parking. TransLink has permission to collect a 7% parking surcharge to off-street parking transactions, but found it too administratively burdensome to collect.

Parking Levy
A special property tax on non-residential parking spaces throughout the region.

Potential Revenue
Potential revenue is large. Assuming that there are one to two qualifying parking spaces per capita, a $50 per space annual tax could generate $100 annually per capita.

Predictability and Stability
Relatively stable, although revenues may decline slightly over time if property owners reduce their parking supply.

Horizontal Equity
Like a fuel tax, this can be considered fair to the degree that motorists benefit from public transit improvements, or to the degree that parking facilities or automobile travel impose currently uncompensated external costs.

Vertical Equity
The ultimate incidence of this tax is difficult to predict, and will vary depending on specific conditions. It will mainly be borne by commercial property owners (residential parking is exempt), and so may marginally increase retail prices, increase parking pricing, and reduce wages. Costs may be reduced if property owners are allowed to reduce their parking supply. To the degree that public transit improvements reduce the need to drive, any regressivity is further reduced.

Travel Impacts
This tax may reduce parking supply and encourage property owners to price parking, which can reduce vehicle travel (Litman 2013; Wardman and Shire 2011). Travel impacts therefore depend on its magnitude, how it is applied, and the flexibility of local parking requirements.

Strategic Development Objectives
This tax encourages reduced parking supply and therefore more compact development.

Public Acceptance
Surveys and focus groups indicate relatively high support for parking taxes. Vancouver region experience indicates possible opposition from suburban businesses.

Ease of Implementation
This tax has relatively high implementation costs, since it requires adding a new field to property records, but once established, ongoing costs are likely to be modest.

Legal Status
May require state or provincial legislation.

Examples (IPIRG 2007; Litman 2012; WWF 2017)
Melbourne, Perth and Sydney, Australia all impose levies on city center non-residential parking spaces to encourage use of alternative modes and fund transport facilities and services. Since 2012, Nottingham, England has imposed a £379 annual levy on approximately 25,000 spaces, representing 42% of total spaces. In its first three years the levy generated £25.3 million, which is dedicated to improving the city's transport infrastructure. The levy has helped increase public transport mode share to over 40%, and reduce carbon emissions by 33%. Local authorities in England may charge employers for the parking they provided for staff via a Workplace Parking Levy, but only one community implemented this option (Burchell, et al. 2019).

Expanded Parking Pricing

Expand where and when public parking is priced, such as metering currently unpriced on-street parking spaces in urban neighborhoods, and charging for off-street parking at public facilities such as for government employees, at schools and parks (Elmendorf and Shanske 2020). This is best implemented as part of a comprehensive parking management program that also includes better pricing systems, user information and enforcement practices.

Potential Revenue

Small to moderate. In most urban areas there are many unpriced publically-owned parking facilities that could be priced, although motorists will avoid using priced parking if possible. Currently only 1-2% of non-residential parking activity is priced, which probably averages $20-40 annual per capita. If this can be tripled to 3-6% it would generate an additional $40-80 annual per capita.

Predictability and Stability

Relatively stable.

Horizontal Equity

Like a fuel tax, this can be considered fair, since these valuable spaces are currently provided free to motorists, and to the degree that automobile travel imposes currently uncompensated external costs, and to the degree that motorists benefit from public transit improvements.

Vertical Equity

Mixed. Lower-income households tend to own fewer vehicles and drive less than higher-income households, so overall impacts will vary depending on specific conditions, including lower-income vehicle ownership rates, and the quality and price of transport and parking options.

Travel Impacts

Parking pricing encourages people to reduce their vehicle ownership and use.

Strategic Development Objectives

Mixed. If implemented as part of an integrated parking management program efficient parking pricing can reduce the total number of parking spaces needed in an area, and total vehicle travel, supporting more compact development. However, if parking is priced in a few major commercial areas it may favor suburban commercial areas, encouraging sprawl.

Public Acceptance

Mixed. Motorists and businesses often oppose parking pricing, although the concept of user paid parking is gaining support as a way to reduce parking problems and generate local revenues.

Ease of Implementation

Parking pricing tends to have relatively high implementation costs to install and operate pricing systems, plus additional transaction costs to motorists.

Legal Status

Many jurisdictions already price public parking.

Examples (Litman 2012; TCRP 2009)

Many communities price a portion of on-street and publically-owned off-street parking spaces.

Development or Transportation Impact Fees

A fee on new development to help fund infrastructure costs, and allow existing development fees to be used for public transit infrastructure investments (MRSC 2010). Transportation or traffic impact fees are similar charges specifically intended to finance transport system improvements, which are sometimes limited to roadway expansion projects.

Potential Revenue

Small to moderate. Since it only applies to new development it depends on the amount of development occurring in the region.

Predictability and Stability

Is highly variable depending on how it is applied and the amount of qualifying development that occurs.

Horizontal Equity

To the degree that new development increases demand for public transit, or that developers benefit from high quality transit service, it can be considered equitable.

Vertical Equity

Uncertain. Although wealthier people tend to purchase more new housing, this fee will increase the costs of all new development and so will tend to increase rents and reduce housing affordability.

Travel Impacts

If the charges discourage more compact, infill development they may increase sprawled development and therefore automobile travel.

Strategic Development Objectives

If the charges discourage more compact, infill development they may increase sprawled development.

Public Acceptance

Surveys and focus groups indicate relatively high support for development fees.

Ease of Implementation

Implementation costs are minimal since development fees are already collected in most jurisdictions.

Legal Status

Most municipalities governments and many region governments have a legal ability to collect such fees, although the use of such funds is often restricted to specific infrastructure, which may exclude public transit facilities and services.

Examples (IPIRG 2007; TCRP 2009)

Many jurisdictions collect development or traffic/transportation impact fees.

Land Value Capture

A special property tax imposed in areas with high quality public transit, intended to recover a portion of the increased land values provided by transit and to help finance the service improvements (AECOM 2015; Suzuki, et al. 2015; Page, Bishop and Wong 2016; Smith and Gihring 2015; Vadali 2014). Sometimes called a *transit benefit district tax* (TRILLIUM Business Strategies 2009). Sclar, Lönnroth and Wolmar (2016) discuss various practical obstacles to efficient application of this funding option.

Potential Revenue

Moderate to large over the long-run.

Predictability and Stability

Difficult to predict, but stable once development occurs.

Horizontal Equity

Is considered horizontally equitable to the degree that high quality public transit provides an extra increase in land values and development revenues.

Vertical Equity

Vertical equity impacts depend on how the tax is structured and development conditions. It tends to capture value from developers and property owners, but some of the tax may be passed on to residents, and it can reduce housing affordability in transit-oriented developments, which is regressive.

Travel Impacts

Depends on details. If such a tax discourages development around transit stations it could reduce transit ridership and transit-oriented development.

Strategic Development Objectives

Mixed. May discourage some transit-oriented development, but it could encourage more concentrated development near transit stations.

Public Acceptance

Surveys and focus groups indicate relatively high support for land value capture.

Ease of Implementation

May require special analysis and legislation to determine the most appropriate tax structure.

Legal Status

In some jurisdictions, state or provincial legislation and support would be required.

Examples (TBoT 2010)

Land value capture in the form of transit benefit districts is used in some U.S. cities including Miami, Florida; Los Angeles, California; and Denver, Colorado. It is used in many major cities such as Hong Kong (Suzuki, et al. 2015).

Station Rents
Collect revenues from public-private developments on publically-owned land in or near transit stations.

Potential Revenue
Probably small. It depends on BC Transit's ability to obtain and develop land around transit stations, and the demand for such building space.

Predictability and Stability
Revenues are difficult to predict, but once established may be relatively stable.

Horizontal Equity
Is considered horizontally equitable to the degree that it captures the value of proximity to high quality public transit.

Vertical Equity
Vertical equity impacts depend on development conditions. It can be an opportunity for a community to raise additional revenue from businesses and higher income residents, but if rents are structured to maximize revenue it may reduce housing affordability in accessible locations (i.e., lower-priced housing in transit-oriented developments) which is regressive.

Travel Impacts
Uncertain. If this increases transit-oriented development it may help reduce total vehicle travel.

Strategic Development Objectives
Uncertain. It may increase or discourage transit-oriented development, depending on how development and rents are structured.

Public Acceptance
Surveys and focus group responses indicate relatively high support for station rents.

Ease of Implementation
Some station development may be relatively easy, but maximizing this revenue option may involve some effort and risks.

Legal Status
Most transit agencies have the legal ability to develop stations, but may require state or provincial approval to condemn land for station development.

Examples
Larger transit agencies with significant space in terminal and station facilities may enter into concession agreements (an income-generating strategy similar to leasing) with a variety of commercial and retail enterprises (TCRP 2009). TransLink has established a Real Estate Division is responsible for acquiring, managing and disposing of TransLink's properties in a manner that optimizes revenue, reduces capital costs and supports TransLink's strategic development goals, which includes station-area development (TransLink 2011).

Station Air Rights
Sell the rights to build over transit stations (Tompkins 2010).

Potential Revenue
Depends on demand for such development. There are generally few sites where such development is feasible, so total potential revenues are probably modest.

Predictability and Stability
Uncertain. Depends on demand for such development.

Horizontal Equity
Is considered horizontally equitable to the degree that it captures the value of proximity to high quality public transit.

Vertical Equity
Vertical equity impacts depend on specific conditions. It can raise revenue from businesses and higher income residents, but if structured to maximize revenue it may reduce housing affordability in accessible locations (i.e., lower-priced housing in transit-oriented developments) which is regressive.

Travel Impacts
Uncertain. If this increases transit-oriented development it may help reduce total vehicle travel.

Strategic Development Objectives
Uncertain. It may increase or discourage transit-oriented development, depending on how development and rents are structured.

Public Acceptance
Surveys and focus groups indicate relatively high support for revenue-generating station area development.

Ease of Implementation
Some station air rights development may be relatively easy, but maximizing this revenue option may involve some effort and risks.

Legal Status
Most transit agencies probably have the legal right sell or rent station-area air rights.

Examples (Tompkins 2010)
The Toronto Transit Commission has investigated options for selling air rights at the York Mills subway station, the Eglinton/Yonge bus terminal, the Sheppard/Yonge station bus terminal and land adjoining the Spadina station (Hall 2002).

Advertising
Most transit agencies collect revenues from transit vehicle, stop and station advertising.

Potential Revenue
Although expanding transit service and increasing transit ridership should allow more advertising, even doubling or tripling of revenue would provide relatively small additional revenue.

Predictability and Stability
Relatively unstable.

Horizontal Equity
No clear impact.

Vertical Equity
No clear impact.

Travel Impacts
No clear impact.

Strategic Development Objectives
No clear impact.

Public Acceptance
Surveys and focus groups indicate relatively high support for advertising. However, there may be public opposition to particular advertising methods or materials.

Ease of Implementation
Since most transit agencies already sell advertising, expansion is relatively easy.

Legal Status
Already widely used.

Examples (TCRP 2009)
Most public transit agencies generate revenue from advertising.

Options Summary

Table 7 summarizes the funding options evaluated in this study.

Table 7 **Potential Public Transport Funding Options**

Name	Description	Advantages	Disadvantages
Fare increases	Increase fares or change fare structure to increase revenues.	Widely applied. Is a user fee (considered equitable).	Discourage transit use. Is regressive.
Discounted bulk passes	Discounted passes sold to groups based on their ridership.	Increases revenue and transit ridership.	Increases transit service costs and so may provide little net revenue.
Property taxes	Increase local property taxes	Widely applied. Distributes burden widely.	Supports no other objectives. Is considered regressive.
Sales taxes	A special local sales tax.	Distributes burden widely.	Supports no other objectives. Is regressive.
Income tax	Special income tax for transit or transportation.	Progressive with respect to income. Relatively stable.	May be difficult to implement.
Fuel taxes	An additional fuel tax in the region.	Widely applied. Reduces vehicle traffic and fuel use.	Is considered regressive.
Vehicle fees	An additional fee for vehicles registered in the region.	Applied in some jurisdictions. Charges motorists for costs.	Does not affect vehicle use.
Utility levy	A levy to all utility accounts in the region.	Easy to apply. Distributes burden widely.	Is small, regressive and support no other objectives.
Employee levy	A levy on employees in a designated area or jurisdiction.	Charges for commuters.	Requires administration. Encourage sprawl if in city centers.
Road tolls	Tolls on some roads or bridges.	Reduces traffic congestion.	Costly to implement. Can encourage sprawl if only applied in city centers.
Vehicle-Km tax	Distance-based fees on vehicles registered in the region.	Reduces vehicle traffic.	Costly to implement.
Parking taxes	Special tax on commercial parking transactions.	Is applied in other cities.	Discourages parking pricing and downtown development.
Parking levy	Special property tax on parking spaces throughout the region.	Large potential. Distributes burden widely. Supports strategic goals.	Costly to implement. Opposed by suburban property owners.
Expanded parking pricing	Increase when and where public parking facilities (e.g. on-street parking) are priced.	Moderate to large potential. Distributes burden widely. Reduces parking & traffic problems.	Requires parking meters and enforcement, and imposes transaction costs.
Development or transport impact fees	A fee on new development to help finance infrastructure, including transit improvements.	Charges beneficiaries.	Limited potential.
Land value capture	Special taxes on property that benefit from the transit service.	Large potential. Charges beneficiaries.	May be costly to implement. May discourage TOD.
Station rents	Collect rents from station public-private developments.	Charges beneficiaries.	Limited potential.
Station air rights	Sell the rights to build over transit stations.	Charges beneficiaries.	Limited potential.
Advertising	Additional advertising on vehicles and stations.	Already used.	Limited potential. Sometimes unattractive.

This table summarizes potential funding options identified in this study.

For more quantitative analysis, these evaluation criteria were rated on a seven-point scale from 3 (strongly supports objective) to -3 (strongly contradicts objective), as illustrated in Table 8. Of course, such ratings are subjective so other people or groups may reach different conclusions. In a typical planning process an advisory committee consisting of informed citizens, technical experts and elected officials would perform these ratings. In this exercise all ratings have the same weight, but they can be weighted to give some objectives more importance than others. Many of these impacts can vary significantly depending on how an option is implemented, local conditions and community preferences, so it is helpful to develop more specific descriptions of how an option would be applied in a particular geographic area.

Table 8 **Potential Local Public Transit Funding Options Summary Matrix**

Name	Potential Revenue	Stability	Horizontal Equity	Vertical Equity	Travel Impacts	Development Impacts	Public Acceptance	Ease to Implement
Fare increases	2	2	2	-3	-3	-2	-3	3
Discounted bulk passes	1	2	2	2	3	2	2	3
Property taxes	3	3	2	-1	0	-1	-2	3
Sales taxes	3	2	1	-2	0	0	-2	3
Fuel taxes	2	2	2	-1	3	2	-2	3
Vehicle levy	2	3	2	-2	0	0	-2	-1
Utility levy	1	3	2	-3	0	0	-3	2
Employee levy	2	3	3	2	0	-1	-2	-2
Road tolls	1	2	3	-2	3	1	-2	-3
Vehicle-Km tax	2	2	3	-2	3	1	-3	-3
Parking taxes	1	2	2	0	2	-2	-1	-1
Parking levy	3	2	2	1	2	2	-2	-3
Expanded parking pricing	2	2	3	1	3	-1	-1	-1
Development cost charges	1	1	2	0	0	-1	3	-1
Land value capture	3	3	2	0	0	-2	2	-2
Station rents	1	2	3	0	0	0	3	-1
Station air rights	1	2	3	0	0	0	3	-2
Advertising	1	1	3	0	0	0	3	3

This table summarizes the degree that the funding options support various planning objectives. Rating range from 3 (strongly supports objective) to -3 (strongly contradicts objective). 0 = no or mixed impacts. Although these results are somewhat subjective and may vary depending on community values and conditions, this illustrates a method for quantifying the advantages and disadvantages of various options that can be applied in other situations.

Conclusions

Public transit service improvements are an important component of many regions' transportation system improvement plans. High quality public transit services can provide various economic, social and environmental benefits, including direct user benefits and various indirect and external benefits. Current demographic and economic trends, including aging population, urbanization, plus concerns about inaffordability, health and environmental protection justify more support for high quality transit. Recent experience indicates that many citizens will support tax increases to improve public transit services.

Implementing transit improvements often requires additional funding. Although some federal, state or provincial funding may be available, significant new local funding is often needed. Based on a detailed review of existing literature, this study identified eighteen funding options, including some that are widely used and others considered innovative and only applied in a few jurisdictions.

These potential funding options were evaluated against eight criteria. Evaluation results can vary depending on perspective and assumptions. Equity analysis is particularly subjective depending on how equity is defined and impacts measured. From some perspectives, it is most equitable to generate transit funding from a narrowly defined group of beneficiaries, such as users of a new transit service, employers who generate commute trips, or owners of transit station area properties. However, high quality public transit tends to provide multiple, dispersed benefits, including external benefits to people who do not currently use the service but benefit from reduced traffic and parking congestion, improved safety, reduced need to chauffeur non-drivers, energy conservation and emission reductions, and increased regional economic development. Public transit improvements tend to provide a broader scope of benefits than highway expansions, so a wider range of funding options can be justified for horizontal equity (i.e., beneficiaries pay) sake.

Widely used public transit funding sources include fares, property taxes, sales taxes, fuel taxes, advertising and station rents. There is potential for increasing revenues from these options, although fare increases contradict other planning objectives. Fuel tax increases and expanded parking pricing (more frequently charging motorists for using public parking facilities, particularly on-street parking in urban neighborhoods) are particularly appropriate because they also encourage fuel conservation and more efficient transport, in addition to raising revenues. However, these taxes and fees are considered burdensome and regressive (their actual regressivity depends on the quality of transport options available, and so is reduced by public transit service improvements) and so should be implemented gradually.

The options that seem most acceptable to the public (development and transportation impact fees, station rents and advertising) tend to generate modest revenue. Economists are particularly enthusiastic about decongestion pricing, but it tends to be costly and politically difficult to implement, and total revenues are often modest since tolls are only collected on a small portion of total vehicle travel. However, New York City recently approved a decongestion pricing program which received political support largely as a transit funding option.

Three new revenue options with significant potential deserve more consideration: *parking levies* (special property taxes on non-residential parking spaces), *vehicle levies* (an additional fee on vehicles registered in the region) and *employee levies* (a levy on each employee, often only collected from larger employers). These could generate relatively large amounts of revenue, distribute costs broadly, and have a logical connection to transit improvements (high quality transit benefit motorists, businesses and employees). A parking levy applied to all non-residential parking spaces in a region would disperse the financial burden and support Strategic Development Objectives (reduce impervious surface and reduce excessive parking supply) by encouraging more compact development and more efficient parking pricing. These three options have moderate implementation costs, more than increasing existing transit funding options, but less than road tolls or vehicle-kilometer fees.

Where feasible, development and transportation impact fees, station rents and air rights can be used to generate funds, but their revenues will vary depending on future demand for transit-area development, and so are difficult to predict and are likely to be modest in most cases.

Land value capture taxes and levies should also be considered. They should be structured to avoid discouraging transit-oriented development (they should not be too high or geographically concentrated), and it may be best to defer their implementation for a few years until station-area demand rises sufficiently. It is particularly appropriate to create local area benefit districts around transit stations where modest special levies and parking meter revenues are used primarily to finance local improvements such as station amenities, streetscaping and special cleaning and security services, rather than financing system-wide transit services.

This research discovered no new funding options that are particularly cost effective and easy to implement. Each funding option has disadvantages and constraints. As a result, this study's overall conclusion is that a variety of funding options should be used to help finance the local share of public transit improvements to ensure stability (so total revenues are less vulnerable to fluctuations in a single economic sector or legal instrument) and distribute costs broadly. Public transit improvements often provide widely dispersed benefits that can justify widely dispersed funding sources. Even people who do not currently use public transit benefit from reduced congestion, increased public safety and health, improved mobility option for non-drivers, regional economic development, and improved environmental quality.

Additional research is recommended to better understand the impacts of these options. Revenue options that are implemented should be structured to maximize benefits and minimize problems. Taxes and levies should be designed to support other regional planning objectives, including increased transit ridership, reduced automobile traffic, economic development, energy conservation, compact development and greenspace preservation and affordability.

Bibliography

AASHTO (2014), *Illustrative Matrix of Surface Transportation Revenue Options*, American Association of State Highway and Transportation Officials (www.aashto.org); http://downloads.transportation.org/TranspoRevenueMatrix2014.pdf.

Judith Adeniyi, Christof Hertel and Dr. Jürgen Perschon (2013), *Financing Sustainable Transport in Africa*, European Institute for Sustainable Transport for the German Federal Environment Agency (Umweltbundesamt); at www.uba.de/uba-info-medien-e/4547.html.

Arturo Ardila-Gomez and Adriana Ortegon-Sanchez (2016), *Sustainable Urban Transport Financing from the Sidewalk to the Subway Capital, Operations, and Maintenance Financing*, World Bank Group (https://openknowledge.worldbank.org); at http://hdl.handle.net/10986/23521.

AECOM (2012), *Detailed Case Studies of Selected Revenue Tools*, Metrolinx (www.metrolinx.com); at http://bit.ly/1JnHzeZ.

AECOM (2015), *Value Capture Roadmap*, Consult Australia; at www.aecom.com/au/wp-content/uploads/2015/12/Value-Capture-Roadmap-2015.pdf.

APTA (2012), *Primer on Transit Funding*: FY 2004 Through FY 2012, American Public Transportation Association (www.apta.org); at www.apta.com/gap/policyresearch/Documents/Primer_SAFETEA_LU_Funding.pdf.

Arturo Ardila-Gomez and Adriana Ortegon-Sanchez (2016), *Sustainable Urban Transport Financing from the Sidewalk to the Subway : Capital, Operations, and Maintenance Financing*, World Bank (www.worldbank.org); at https://openknowledge.worldbank.org/handle/10986/23521.

BA Group (2011), *TDM Migration Funding*, World Parking Symposium (www.worldparkingsymposium.ca); at www.worldparkingsymposium.ca/parking-library/download/196/R.Bond%20Funding%20TDM%20Migration.pdf.

David Banister and Mark Thurstain-Goodwin (2011), "Quantification Of The Non-Transport Benefits Resulting From Rail Investment," *Journal of Transport Geography*, Vol. 19, Is. 2, March, pp. 212-223; earlier version at www.tsu.ox.ac.uk/pubs/1029-banister.pdf.

Phineas Baxandall, (2007), *Finding Solutions To Fund Transit Combining Accountability & New Resources For World-Class Public Transportation*, U.S. PIRG (www.uspirg.org).

Boulder (2013), Neighborhood Eco (NECO) Pass, City of Boulder (www.bouldercolorado.gov); at www.bouldercolorado.gov/index.php?option=com_content&task=view&id=8835&Itemid=3002.

Jeffrey Brown, Daniel Baldwin Hess and Donald Shoup (2003), "Fare-Free Public Transit at Universities: An Evaluation," *Journal of Planning Education and Research*, Vol. 23 (www.sppsr.ucla.edu//dup/people/faculty/shoup/fare-free.pdf), pp. 69-82.

Ralph Buehler and John Pucher (2010), "Making Public Transport Financially Sustainable," *Transport Policy*, Vol. 18; at http://policy.rutgers.edu/faculty/pucher/Sustainable.pdf.

Jonathan Burchell, et al. (2019), "Implementation of the Workplace Parking Levy as a Transport Policy Instrument," *Journal of Transport Geography*, Vol. 80 (https://doi.org/10.1016/j.jtrangeo.2019.102543).

Cambridge Systematics (2006), *Future Financing Options to Meet Highway and Transit Needs*, NCHRP 102, Transportation Research Board (www.trb.org); at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_w102.pdf.

Don Cayo (2012), "Road Tolls Recommended For Metro – Extensive Levies Aimed At Raising Millions For Translink," *Vancouver Sun*; at https://bit.ly/3NZBICr.

CBC (2012), *GTA Regional Sales Tax*, Canadian Broadcasting (www.cbc.ca); at www.cbc.ca/news/canada/toronto/story/2012/04/18/gta-regional-sales-tax-toronto657.html.

City of Cincinnati (2016), *City of Cincinnati Income Tax Section 311-1 – Authority to Levy Tax; Effective Periods*; at www.cincinnati-oh.gov/finance/income-taxes/resources-references/income-tax-ordinance-effective-1-1-2016.

CNT (2012), *Average Annual Transportation Costs for the National Typical Household Ranked for Large Regions*, Center for Neighborhood Technology (www.cnt.org); at www.cnt.org/repository/2012-Fact-Sheet-Rankings.pdf.

CODATU (2009), *Who Pays What for Urban Transport? Handbook of Good Practices*, Cooperation for Urban Mobility in the Developing World (www.codatu.org); at www.codatu.org/wp-content/uploads/handbook_good_practices.pdf.

CSG (2008), *Financing Public Transportation*, Council of State Governments (www.csg.org); at www.csg.org/knowledgecenter/docs/TIA_PublicTrans_screen.pdf.

CTE (2007), *Election Resources and Issues*, Center for Transportation Excellence (www.cfte.org); at www.cfte.org/success/elections.asp.

CTOD (2011), *Transit and Regional Economic Development*, Center for Transit Oriented Development (www.ctod.org/portal); at http://reconnectingamerica.org/assets/Uploads/TransitandRegionalED2011.pdf.

CTS (2009), *Understanding the Impacts of Transitways: Demographic and Behavioral Differences Between Hiawatha Light-Rail and Other Transit Riders*, Center for Transportation Studies, University of Minnesota (www.cts.umn.edu); at www.cts.umn.edu/Research/Featured/Transitways.

Graham Currie (2011), "Agglomeration Economies: Understanding Benefits In Mass Transit Project Evaluation," *The Economics of Transport: Smarter Transport – Better Cities*, Metropolitan Transport Forum (www.mtf.org.au), pp. 68-76; at www.mtf.org.au/site/files/ul/data_text12/2299874.pdf.

Kevin DeGood (2012), *Thinking Outside the Farebox: Creative Approaches to Financing Transit Projects*, Transportation for America (http://t4america.org); at https://bit.ly/3uEWXT4.

Rodrigo Diaz and Daniel Bongardt (2013), *Financing Sustainable Urban Transport - International Review of National Urban transport Policies and Programmes*, Sustainable Transport in China (http://sustainabletransport.org), GIZ and Embarq; at https://bit.ly/3RpWVs0.

Earthvoice Strategies (2012), *Victoria Regional Rapid Transit Project: Survey of Public Transit Capital Funding Strategies in Canadian Peer Communities*, CRD Local Funding Options (www.lrtlocalfunding.ca).

ED & Équiterre (2024), *Putting Wheels on the Bus: Unlocking the Potential of Public Transit in Canada to Cut Carbon Emissions*, Environmental Defence (https://environmentaldefence.ca) and Équiterre; at http://tinyurl.com/22ay4y4f.

EDRG (2007), *Time is Money: The Economic Benefits of Transit Investment*, Economic Development Research Group for the Chicago RTA; at www.chicagometropolis2020.org/documents/TimeisMoney.pdf.

Chris Elmendorf and Darien Shanske (2020), *How to Solve the Transit Budget Crunch: Price the Private Use of Public Streets*, SPUR (www.spur.org); at https://bit.ly/3RsUa9a.

Marcus Enoch and Stephen Ison (2006), "Levying Charges on Private Parking: Lessons From Existing Practice," *World Transport Policy & Practice*, Vol. 12, No. 1 (http://ecoplan.org/wtpp/general/vol-12-1.pdf), pp. 5-14.

Christina D. Funk, Michael J. Higgins and Gregory L. Newmark (2023), "Operating Subsidies and Transit Efficiency: Applying New Metrics to Old Problems," *Transportation* (https://doi.org/10.1007/s11116-023-10441-w).

James Fletcher and Doug McArthur (2010), *Local Prosperity: Options for Municipal Revenue Growth in British Columbia*, Think City; at https://bit.ly/3OXGam9.

David J. Forkenbrock and Glen E. Weisbrod (2001), *Guidebook for Assessing the Social and Economic Effects of Transportation Projects*, NCHRP Report 456, Transportation Research Board, National Academy Press (www.trb.org); at http://gulliver.trb.org/publications/nchrp/nchrp_rpt_456-a.pdf.

Yonah Freemark and Lindiwe Rennert (2023), *Surmounting the Fiscal Cliff Identifying Stable Funding Solutions for Public Transportation Systems*, Urban Institute (ww.urban.org); at https://urbn.is/3QFuKa9.

Peter J. Haas and Katherine Estrada (2011), *Revisiting Factors Associated with the Success of Ballot Initiatives with a Substantial Rail Transit Component*, Mineta Transportation Institute (http://transweb.sjsu.edu); at http://transweb.sjsu.edu/PDFs/research/2911-Ballot-Initiatives-Rail-Transit.pdf.

Joseph Hall (2002), "TTC Explores Selling Station 'Air Rights," *Toronto Star*; at http://transit.toronto.on.ca/archives/data/200203200100.shtml.

Edward Huang, Henry Lee, Grant Lovellette and Jose Gomez-Ibanez (2010), *Transportation Revenue Options: Infrastructure, Emissions, and Congestion*, Belfer Center (www.belfercenter.org/enrp); at http://bit.ly/2juenxy.

Ryan Holeywell (2013), "To Toll or Not: Could the Feds Lift a Ban on Interstate Tolling?" *Governing Magazine* (www.governing.com); at www.governing.com/blogs/fedwatch/gov-could-feds-lift-ban-interstate-tolling.html.

HDR (2015), *Alternative Funding For Canadian Transit Systems*, Canadian Urban Transit Association (http://cutaactu.ca); at http://cutaactu.ca/sites/default/files/cuta_alternative_funding_report_may_2015.pdf.

Winnie Hu (2019), "Congestion Pricing: N.Y. Embraced It. Will Other Clogged Cities Follow?," *New York Times* (www.nytimes.com); at www.nytimes.com/2019/04/01/nyregion/new-york-congestion-pricing.html.

IPIRG (2007), *Finding Solutions To Fund Transit: Combining Accountability & New Resources For World-Class Public Transportation*, Illinois Public Interest Research Group (http://illinoispirg.org); at https://bit.ly/2VLP2k7.

ITF (2013), *Funding Urban Transportation: A Case Study Compendium*, International Transport Forum (www.internationaltransportforum.org); at www.internationaltransportforum.org/Pub/pdf/13Compendium.pdf.

ITF (2024), *The Future of Public Transport Funding*, International Transport Forum (https://www.itf-oecd.org); at https://www.itf-oecd.org/future-public-transport-funding?s=03.

Eric Jaffe (2013), *Raising Fares Is Not the Only Way to Fund Public Transportation*, Atlantic Cities (www.theatlanticcities.com); at https://bit.ly/2pgzOrf.

Matthew Kitchen (2019), *Fair and Efficient Congestion Pricing for Downtown Seattle*, EcoNorthwest; at https://bit.ly/32ifT9Q.

Adeel Lari, et al. (2009), *Value Capture for Transportation Finance*, Center for Transportation Studies University of Minnesota (www.cts.umn.edu); at www.cts.umn.edu/Research/Featured/ValueCapture/index.html.

David Levinson (2014), *How to Make Mass Transit Financially Sustainable Once and for All The Seven-Part Case For Operating Public Transportation As A Public Utility*, City Lab (www.citylab.com); at https://bit.ly/31gAo5E.

David Levinson and David King (2013), *The Case For (And Against) Public Subsidy For Public Transport*, Streets MN (http://streets.mn); at https://bit.ly/2Bi2KBL.

Todd Litman (2002), "Evaluating Transportation Equity," *World Transport Policy & Practice* (http://ecoplan.org/wtpp/wt_index.htm), Volume 8, No. 2, Summer, pp. 50-65; at www.vtpi.org/equity.pdf.

Todd Litman (2004), *Rail Transit in America: Comprehensive Evaluation of Benefits*, VTPI (www.vtpi.org); at www.vtpi.org/railben.pdf; summarized in "Impacts of Rail Transit on the Performance of a Transportation System," *Transportation Research Record 1930*, Transportation Research Board (www.trb.org), pp. 23-29.

Todd Litman (2004b), "Transit Price Elasticities and Cross-Elasticities," *Journal of Public Transportation*, Vol. 7, No. 2, (www.nctr.usf.edu/jpt/pdf/JPT 7-2 Litman.pdf), pp. 37-58; at www.vtpi.org/tranelas.pdf.

Todd Litman (2009), *Transport Cost and Benefit Analysis*, Victoria Transport Policy Institute (www.vtpi.org); at www.vtpi.org/tca.

Todd Litman (2010), *Raise My Taxes, Please! Evaluating Household Savings From High Quality Public Transit Service*, VTPI (www.vtpi.org); at www.vtpi.org/raisetaxes.pdf.

Todd Litman (2011), *Evaluating Public Transit Benefits and Costs*, Victoria Transport Policy Institute (www.vtpi.org); at www.vtpi.org/tranben.pdf.

Todd Litman (2012), *Parking Pricing Implementation Guidelines: How More Efficient Pricing Can Help Solve Parking Problems, Increase Revenue, And Achieve Other Planning Objectives*, Victoria Transport Policy Institute (www.vtpi.org); at www.vtpi.org/parkpricing.pdf.

Todd Litman (2013), *Transport Elasticities: Impacts on Travel Behaviour: Understanding Transport Demand To Support Sustainable Travel Behavior*, Technical Document #11, Sustainable Urban Transport Project (www.sutp.org) and GIZ (www.giz.de); at www.sutp.org/index.php/en-dn-tp. Also see, *Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior* at www.vtpi.org/elasticities.pdf.

Todd Litman (2014), "Evaluating Public Transportation Local Funding Options," *Journal of Public Transportation*, Vol. 17, No. 1, 2014, pp. 43-74; at http://www.nctr.usf.edu/wp-content/uploads/2014/03/JPT17.1.pdf.

Todd Litman (2015), *Eleven Reasons to Support Vancouver's Transportation Tax*, Victoria Transport Policy Institute (www.vtpi.org); at www.vtpi.org/VanTransitTax.pdf.

Stephanie Lotshaw and Kirk Hovenkotter (2019), *A Fare Framework: How Transit Agencies Can Set Fare Policy Based on Strategic Goals*, The Transit Center (https://transitcenter.org); at https://bit.ly/3nRJbZu.

Aisha Majid (2021), "Is There a Way to Pandemic-Proof Public Transportation Funding?," *City Monitor* (https://citymonitor.ai); at https://bit.ly/3coGzxQ.

Brian E. McCollom and Richard Pratt (2004), *Transit Pricing and Fares*, Chapter 12, TCRP Report 95, Transit Cooperative Research Program (www.tcrponline.org); at www.trb.org/publications/tcrp/tcrp_rpt_95c12.pdf.

METRO (2017), *LA County's Measure M Lessons Learned*, Los Angeles METRO (http://metro.net); at http://theplan.metro.net/wp-content/uploads/2018/05/report-theplan-lessons-learned-2018.pdf

Mobility Pricing Independent Commission (MPIC) (2017), *Moving Around Metro Vancouver: Exploring New Approaches to Reducing Congestion*, It's Time (www.itstimemv.ca), Mayors' Council on Regional Transportation and the TransLink Board of Directors; at http://bit.ly/2zIkyDk.

MRSC (2010), Transportation Impact Fees, Municipal Research and Service Center of Washington (www.mrsc.org); at www.mrsc.org/subjects/planning/transimpactfees.aspx.

Susan Orr (2016), "Marion County Votes For Higher Taxes To Pay For Expanded Transit," *Indianapolis Business Journal* (www.ibj.com), 8 November 2016; at https://bit.ly/3nRIWO4.

Sasha Page, Bill Bishop and Waiching Wong (2016), *Guide to Value Capture Financing for Public Transportation Projects*, TCRP Research Report 190, Transportation Cooperative Research Program (www.nap.edu); at www.nap.edu/catalog/23682/guide-to-value-capture-financing-for-public-transportation-projects.

John E. Petersen (2008), "Planning and Financing The Washington Metropolitan Area Transit Authority," *Managing And Financing Urban Public Transport Systems An International Perspective*, Local Government and Public Service Reform Initiative (http://lgi.osi.hu); at http://lgi.osi.hu/publications/2008/384/UT_A_416_WEB.pdf.

Kevin Pula, Douglas Shinkle and Jaime Rall (2015), *On Track: How States Fund and Support Public Transportation*, National Conference of State Legislatures (www.ncsl.org); at http://bit.ly/2e5B7S0.

Quay Communications Inc. (2012), *Victoria Regional Rapid Transit: Local Funding Options Focus Group Report*, CRD Local Funding Options (www.lrtlocalfunding.ca), Capital Regional District (www.crd.bc.ca); at http://bit.ly/2eVP8kp.

Stephen L. Reich, Janet L. Davis and Braden Sneath (2012), *Florida MPOAC Transportation Revenue Study*, Center for Urban Transportation Research for the Florida Metropolitan Planning Organization Advisory Council (www.mpoac.org); at www.mpoac.org/revenuestudy/RS_FINAL_REPORT.pdf.

Ko Sakamoto, Stefan Belka and Gerhard P. Metschies (2010), *Financing Sustainable Urban Transport*, GTZ Sourcebook Module, Sustainable Urban Transport Project (www.sutp.org) Asia and the German Technical Cooperation (www.gtz.de/en); at www2.gtz.de/urbanet/library/detail1.asp?number=8114.

K. Sakamoto, H. Dalkmann and D. Palmer (2010), *A Paradigm Shift Towards Sustainable Low-Carbon Transport: Financing the Vision ASAP*, Partnership on Sustainable Low-Carbon Transport (SLoCaT Partnership; www.slocat.net), Transportation Research Laboratory and the Institute for Transportation & Development Policy; at www.itdp.org/documents/A_Paradigm_Shift_toward_Sustainable_Transport.pdf.

Lisa Schweitzer and Brian Taylor (2008), "Just Pricing: The Distributional Effects Of Congestion Pricing And Sales Taxes," *Transportation*, Vol. 35, No. 6, pp. 797–812 (www.springerlink.com/content/l168327363227298); summarized in "Just Road Pricing," *Access 36* (www.uctc.net/access); Spring 2010, pp. 2-7; at www.uctc.net/access/36/access36.pdf.

Elliott D. Sclar, Måns Lönnroth and Christian Wolmar (2016), *Improving Urban Access: New Approaches to Funding Transport Investments*, Earthscan (www.routledge.com); http://bit.ly/2ngcMvt.

Bruce Schaller (2018), *Making Congestion Pricing Work*, Schaller Consulting (www.schallerconsult.com); at www.schallerconsult.com/rideservices/makingpricingwork.htm.

Jeffery J. Smith and Thomas A. Gihring (2015), *Financing Transit Systems Through Value Capture: An Annotated Bibliography*, Geonomy Society (www.progress.org/geonomy); also at www.vtpi.org/smith.pdf.

Nancy Solomon (2024), To save NJ Transit, Gov. Murphy wants to raise taxes on NJ's wealthiest companies, The Gothamist (https://gothamist.com); at http://tinyurl.com/25ez56fd.

Steer Davies Gleave (2016), *Funding and Financing Public Transport Infrastructure*, Campaign for Better Transport (http://cbtthoughtleadership.org.uk); at http://cbtthoughtleadership.org.uk/SDGFundingAndFinancingReport.pdf.

Hiroaki Suzuki, Jin Murakami, Yu-Hung Hong and Beth Tamayose (2015), *Financing Transit-Oriented Development with Land Values: Adapting Land Value Capture in Developing Countries*, World Bank (www.worldbank.org); at https://openknowledge.worldbank.org/handle/10986/21286.

TBoT (2010), *The Move Ahead: Funding "The Big Move"*, Toronto Board of Trade (www.bot.com); at http://bit.ly/2eEj8Cv.

TC (2008), *The Full Cost Investigation of Transportation in Canada*, Transport Canada (www.tc.gc.ca/pol/en/aca/fci/menu.htm).

TCRP (1998), *Funding Strategies for Public Transportation*, Report 31, Transit Cooperative Research Program (TCRP), at http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_31-1-a.pdf.

TCRP (2008), *Uses Of Fees Or Alternatives To Fund Transit*, Legal Research Digest 28, Transit Cooperative Research Program (TCRP), at http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_lrd_28.pdf.

TCRP (2009), *Local and Regional Funding Mechanisms for Public Transportation*, Report 129, Transit Cooperative Research Program (TCRP), at http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_129.pdf.

TISAP (2013), *Making the Move: Choices and Consequences*, Transit Investment Strategy Advisory Panel (www.transitpanel.ca); at www.transitpanel.ca/news/report-making-the-move-to-fund-transit.

Ray Tomalty (2007), *Innovative Transportation Infrastructure Mechanisms for Smart Growth*, Smart Growth BC (www.smartgrowth.bc.ca); at www.smartgrowth.bc.ca/Portals/0/Downloads/sgbc-infrastructure-report-web.pdf.

James Tompkins (2010), "'Air Rights' In Ottawa: Maximizing The Value Of Public Transit Infrastructure," *Journal of Public Transit in Ottawa* (www.transitottawa.ca), at http://transitottawa.netfirms.com/transitottawa.ca/JPTO_Vol1_W2010.pdf.

TransLink (2011), *Doing Business with Translink: Real Estate*, TransLink (www.translink.ca); at www.translink.ca/en/About-Us/Doing-Business-with-TransLink/Real-Estate.aspx.

TransLink (2012), *TransLink Funding Website* (https://bit.ly/3Pc5yEQ).

Transtech Management (2003), *Financing Capital Investment: A Primer for the Transit Practitioner*; TCRP Report 89, Transportation Research Board (www.trb.org); at http://pubsindex.trb.org/view.aspx?type=MO&id=644466.

TRB (2011), *Equity of Evolving Transportation Finance Mechanisms*, Special Report 303, Transportation Research Board (www.trb.org); at http://onlinepubs.trb.org/onlinepubs/sr/sr303.pdf.

Trillium Business Strategies (2009), *Land Value Capture as a Tool to Finance Public Transit Projects in Canada*, The Surface Policy Directorate Transport Canada (www.tc.gc.ca); at http://bit.ly/2dUxcUM.

UITP (2003), *The Financing of Public Transport Operations*, International Association of Public Transport (www.uitp.org); at www.uitp.org/mos/focus/Financingen.pdf.

UTCM (2010), *A Guide to Transportation Funding Options; Transit Funding – Summary of Funding Strategies*, University Transportation Center for Mobility, Texas Transportation Institute (http://utcm.tamu.edu); at http://utcm.tamu.edu/tfo/transit/summary.stm.

Sharada R. Vadali (2014), *Using the Economic Value Created by Transportation to Fund Transportation: A Synthesis of Highway Practice*, NCHRP 459, Transportation Research Board (www.trb.org); at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_459.pdf.

VRRT (2012), *Victoria Regional Rapid Transit Local Funding Options Backgrounder*, *Victoria Regional Rapid Transit Local Funding* (www.lrtlocalfunding.ca); at http://bit.ly/2bAnIAg.

VTPI (2012), *Regional Transit Local Funding Options: Draft Technical Analysis*, Victoria Regional Rapid Transit Local Funding Options (www.lrtlocalfunding.ca); at http://bit.ly/2f0ihJr.

Mark Wardman and Jeremy Shires (2011), *Price Elasticities of Travel Demand in Great Britain: A Meta-analysis*, Paper 11-3544, TRB Annual Meeting (www.trb.org); at http://trid.trb.org/view.aspx?id=1093095.

Asha Weinstein Agrawal and Hilary Nixon (2015), *What Do Americans Think About Federal Tax Options to Support Public Transit, Highways, and Local Streets and Roads? Results from Year Six of a National Survey*, Mineta Transportation Institute (http://transweb.sjsu.edu); at https://bit.ly/3P3sd6y.

Asha Weinstein Agrawal and Hilary Nixon (2015), *What Do Americans Think About Federal Tax Options To Support Public Transit, Highways, And Local Streets And Roads? Results From Year Five Of A National Survey*, Mineta Transportation Institute (http://transweb.sjsu.edu); at https://bit.ly/3yYOb54.

Dave Wetzel (2006), "Innovative Ways of Financing Public Transport," *World Transport Policy & Practices*, Vol. 12, No. 1 (www.ecoplan.org/wtpp), pp. 40-46.

Chuck Wolfe (2019), "What London and Stockholm can Teach Seattle about Congestion Pricing," *Crosscut* (https://crosscut.com); at https://crosscut.com/2019/06/what-london-and-stockholm-can-teach-seattle-about-congestion-pricing.

WWF (2017), *Workplace Parking Levy, Nottingham*, International Case Studies for Scotland's Climate Plan, World Wildlife Fund (www.wwf.org.uk); at https://bit.ly/2l5fB2m.

Shahid Yusuf (2016), *Developing a Common Narrative on Urban Accessibility: A Fiscal / Finance Perspective*, Brookings Institution (www.brookings.edu); at www.brookings.edu/wp-content/uploads/2017/01/financial-digital.pdf.

Acknowledgments

This paper is based on research sponsored by the Victoria Regional Transit Commission (VRTC) and the Capital Regional District (CRD). Thanks to my research partners Jan Pezarro and Mark Pezarro, and fellow Task Force members Robert Lapham, Jonathan Norgaard, Erinn Pinkerton and Marg Misek-Evans.

www.vtpi.org/tranfund.pdf