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CANADIAN CENTRE
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CCPA–BRITISH COLUMBIA 10th ANNIVERSARY

May 2007

Fair Fares

Enhancing BC's Transit Use and Affordability

By Stuart Murray

In Greater Vancouver, transit users currently pay 57 per cent of the cost of transit through transit fares, with the remainder paid through other sources, primarily property and fuel taxes.[1] It makes sense that transit would be heavily subsidized, because if transit users paid for the full cost of this service, fares would become prohibitive for many users and ridership would decline. In effect, we subsidize public transit to increase ridership.

Public transit is a necessity and a core piece of public infrastructure. We need public transit to connect residents with workplaces, and to allow people access to the services they need. Without affordable public transit, some people would not be able to get to work, making the economy worse from the perspective of both citizens and employers.

Increased ridership is desirable because of the benefits of reduced traffic congestion, lower costs, and greater road safety. We are living in a world of finite oil stocks and a potentially decreasing annual oil supply. It is also desirable that Canadians reduce their greenhouse gas emissions, as part of our duty as global citizens. For these reasons and more, it is desirable that we use public transit more and automobiles less.

This paper looks at the impacts of transit fares on transit users. First, we look at the impact of transit fares on those with low incomes. Part of the reason we subsidize public services is out of concern that people from different income groups are able to access workplaces and both public and private services. Second, we look at the effects of transit fares on the broader riding public. Since higher costs typically discourage use of a good or service, we consider the potential positive impacts lower fares would have on ridership.

Transit Reliance Among Vancouver's Poor

The impact of fares on low-income transit riders and on general ridership is an important issue. For many goods and services, we are expected to pay the full cost of what we consume. However, in the case of many public services, we provide access for free or at a reduced rate, and cover the remaining costs with revenues generated through our tax system. In general, we subsidize these services because we do not want to limit access to them based on income.

Owning and operating a car is an expensive proposition – too expensive for many low-income people. We know from Statistics Canada data that about half of all the households that don't own cars are in the poorest 20 per cent of households. Average household income in this group is just a bit above the Low Income Cut-Off for a large city.[2] One study found that for a variety of family sizes, operating a vehicle costs between $979 and $2,023 per year more than the cost of transit.[3] It is therefore no surprise that among poorer families automobile ownership is low and transit dependency is high.

Although people from all socio-economic backgrounds ride public transit, for those who cannot afford a car, transit use is more common. A recent survey by Statistics Canada found that for Vancouverites with a family income of less than $20,000, transit ridership is 23.1 per cent compared to 9.1 per cent for those with a family income over $80,000.[4]

The survey also found that in Vancouver, transit use is far more common among groups that are likely to have lower incomes, such as women, youth, and recent immigrants. While 10 per cent of men commute to work by transit, 16 per cent of women take transit. Among those aged 15 to 29 years of age, ridership is 17 per cent compared to about 10 to 13 per cent for those between the ages of 30 and 60. While only 11 per cent of the Canadian-born population uses transit to commute, ridership is higher for immigrants, particularly if they arrived in Canada more recently. Ridership is 11 per cent for those who immigrated more than 20 years ago, 15 per cent for those who immigrated 11 to 20 years ago, and 21 per cent for those who immigrated within the past 10 years.

This raises a big issue when we make decisions about transit fares. For those with lower incomes, transit fares are a larger percentage of their cost of living.

Table 1: Tansit Fares and the Low Income Cut-Off (LICO)

Family Size	Low Income Cut-Off	Annual Cost of Fare Passes			Fares as % of LICO		
		1-Zone	2-Zone	3-Zone	1-Zone	2-Zone	3-Zone
1 Person	$17,219	$828	$1,140	$1,560	4.8%	6.6%	9.1%
2 Persons	$20,956	$1,656	$2,280	$3,120	7.9%	10.9%	14.9%
3 Persons	$26,095	$2,136	$2,760	$3,600	8.2%	10.6%	13.8%
4 Persons	$32,556	$2,616	$3,240	$4,080	8.0%	10.0%	12.5%

Notes: The annual cost of fare passes is based on the cost of a 1-zone fare pass at $69 per month, a 2-zone fare pass at $95 per month, a 3-zone fare pass at $130 per month, and a concession fare of $40 per month. For a one- and two-person household we assume both residents are working adults, and for three- and four-person families we assume the remaining household members are school-aged children eligible for a concession fare.

Sources: Low Income Cut-Off data are 2005 after tax cut-offs (1992 base) for communities with over 500,000 residents. Data comes from *Low Income Cut-Offs for 2005 and Low Income Measures for 2004*, Statistics Canada, April 2006, Catalogue No. 75F0002MIE – No. 004. Transit fares are May 2007 data from TransLink's website.

Table 1 shows the cost of transit fares and the Low Income Cut-Off (LICO) for a variety of family sizes. Depending on how many zones are purchased, the annual cost of fare passes ranges from $828 to $1,560 per year, per individual. For households with more than one transit user, total costs can be very high – over $4,000 per year for households with four transit users traveling three zones.

Transit fare purchases range from about 5 to 15 per cent of the LICO. For households with more than one resident, transit fares cost about 8 per cent of income for one-zone travel. For those multi-resident households that must travel more than one zone, the cost is over 10 per cent for two-zone travel and between 13 per cent and 15 per cent for three-zone travel. Of course, for those households with incomes well below the LICO (such as anyone receiving social assistance), transit costs represent a much higher share of total income.

Because transit is such a large expense for those who have low incomes, fare increases take a substantial bite out of household income. For example, if a household is spending more than 10 per cent of income on transit, a 10 per cent fare increase would consume over 1 per cent of household income. For those getting by with very little, these small sums would be sorely missed. In some cases individuals may have to go without transit, and in the process pass up opportunities to fully participate in mainstream society (which is a definition of poverty).

Impact of Fares on Ridership

Changes in fares tend to have a different impact on those who are transit dependent (such as those with low incomes and those who do not drive cars) than on those who are discretionary riders (those who can choose to drive).

Lower-income transit riders tend to be a captive market, and therefore changes in fares do not tend to change their level of ridership very much.[5] Transit-dependent people do not generally choose between transit and other options, because they mostly ride transit, and ride as much as they can afford. Once their basic demand is satisfied, they make fewer trade-offs between transit and other options. This also shows that public transit, as the least expensive mode of travel (save walking or biking), has a kind of monopoly over the travel choices of those with limited incomes.

A reduction in transit fares would have the dual benefit of relieving hardship among the poor and increasing ridership among the broader public.

However, a fare reduction would increase the number of trips that transit-dependent people take if they could otherwise not have afforded to take a trip. In other words, fare reductions increase their mobility and give them greater freedom to move around the city where otherwise they would have to stay put.

Therefore, a reduction in transit fares would have the dual benefit of relieving hardship among the poor and increasing ridership among the broader public.

We can take a closer look at the total impact of a 10 per cent reduction in fares by combining information from TransLink with research on the impact of fares on ridership.

In 2005, TransLink's fare revenues were $285.5 million and there were 161 million revenue passengers. This means that the fares per revenue passenger were $1.77. This number is interesting on its own, as it implies

that the majority of transit users are not paying the full fare – $2.25 for one zone. Indeed, it appears that a large number of riders pay cheaper fares either through concession fares for seniors and youth, the use of transit tickets, or extensive use of monthly passes.

The impact of reduced fares on ridership is reflected in research on "elasticity," the responsiveness of changes in demand to a change in price. In this case elasticity measures the marginal effect on ridership of a 1 per cent increase in fares. According to one study, elasticity varies widely depending on transit dependency, city size, fare level, rail or bus travel, service levels, and the cross effects of the cost of car ownership.[6] The impacts are also smaller over the short term and larger over the long term, in part reflecting that it takes time for people to make trade-offs between the location of home and work as well as car ownership decisions.

Table 2 shows the short- and long-term impacts of fare decreases of 10, 20 and 30 per cent.

In the short term, many commuters would change their behaviour in response to the price of transit. We project that a 10 per cent fare cut would lead to short-term ridership increases of 2.47 per cent or 4 million more passengers per year. The total additional cost to TransLink would be approximately $35 million per year in the

Table 2: Projected Impact of a Fare Decrease

Short-term Impacts				
		Amount of Fare Decrease		
	2005	**10%**	**20%**	**30%**
Fare revenue	$286 million	$263 million	$240 million	$214 million
Transit operating cost	$500 million	$513 million	$525 million	$536 million
Total fare subsidy (cost minus revenue)	$215 million	$249 million	$285 million	$322 million
Total additional cost to TransLink		$35 million	$70 million	$107 million
Total revenue passengers	161 million	165 million	169 million	173 million
Change in total passengers		4 million	8 million	12 million
Percent increase in passengers		2.47%	4.88%	7.23%
Long-term Impacts				
		Amount of Fare Decrease		
	2005	**10%**	**20%**	**30%**
Fare revenue	$286 million	$276 million	$260 million	$240 million
Transit operating cost	$500 million	$536 million	$570 million	$601 million
Total fare subsidy (cost minus revenue)	$215 million	$261 million	$310 million	$361 million
Total additional cost to TransLink		$46 million	$95 million	$146 million
Total revenue passengers	161 million	173 million	183 million	194 million
Change in total passengers		12 million	23 million	33 million
Percent increase in passengers		7.25%	13.98%	20.22%

Note: Totals in millions are not exact due to rounding.

Source: 2005 figures for revenues, operating costs and passengers are from the *TransLink 2005 Annual Report*. The methodology for these calculations is detailed in the technical notes at the end of this paper.

short term. With a 30 per cent fare decrease, ridership would increase by an estimated 7.23 per cent, a total of 12 million more passengers per year, with a total additional cost to TransLink of $107 million per year.

In the long term, far more commuters would increase their ridership in response to lower fares. A 10 per cent fare cut would lead to a projected ridership increase of 7.25 per cent over the long term, which reflects 12 million more passengers per year, with a total annual cost to TransLink of $46 million. A 30 per cent fare cut would lead to a projected ridership increase of 20.22 per cent over the long-term, a total of 33 million more passengers a year, with a total annual cost to TransLink of $146 million.

Increased ridership would also place pressure on the existing capital infrastructure. For example, when the U-pass was introduced, the increased use of transit among university students resulted in crowded buses along routes leading to the UBC and SFU campuses, necessitating an increase in the number of buses serving these areas. TransLink currently plans to spend $1.7 billion on expanded transit infrastructure from 2004 to 2013.[7] Increased ridership resulting from reduced fares would likely require that some of that money, or additional funds, be invested prior to a fare reduction to meet anticipated demand.

While the $146 million long-term cost of a 30 per cent fare reduction may seem like a lot of money, we need to consider that the total provincial budget in 2006-07 was $33.9 billion. In terms of the range of choices that could be made to improve our economic, social or environmental well-being, this is a relatively small price to pay for a major change in the way large numbers of people get around.

It is also noteworthy that the negative impact on fare revenue would be reduced over time. In our cost estimates for a 10 per cent fare reduction, we find that TransLink would lose $22 million per year in revenue in the short term, but the revenue shortfall would decline to $10 million per year in the long term. This is because the increased ridership would eventually make up for most of the shortfall in per-passenger revenue.

Over the long term about 79 per cent of the increased cost to TransLink from a 10 per cent fare reduction would be the cost of accommodating a larger number passengers. Of the $46 million increased cost to TransLink, $36 million would be operating costs resulting from increased ridership. Much of the increase in capital investment would also be a cost resulting from increased ridership.

The effects of fare decreases seem increasingly important as we look at a variety of policies TransLink has used in the past few years. Most notably, we should look at the way targeted fare reductions resulting from implementing the U-Pass increased ridership among university students. According to the 2004 transit ridership report to the TransLink board, the U-Pass program generated 1.6 million additional new transit trips by

students of the two universities in 2004 compared to 2003, accounting for approximately 15 per cent of all ridership growth that year.[8]

TransLink's transit ridership reports have over the years made frequent mention of the effects of fare changes on ridership, particularly the dampening effects that fare increases have on long-term ridership growth.

Conclusion

Reducing transit fares is the right thing to do. Fare reductions make transit more accessible to vulnerable groups who are most dependent on it, and also lessen the financial burden of transit on their personal budgets. Furthermore, we know that reducing fares would have a positive effect on ridership among the broader public.

Our various levels of government collect revenue from many sources, move revenues from one level to the next, and apply revenues to subsidize (or provide for free) a range of services that are deemed to be in the public good. Yet in the case of public transit, we have maintained a tradition of paying for the service mostly through user fees. We must remember that public finances are based on choices. We can choose to reduce the impact of user fees on transit riders, much as we have chosen over the decades to reduce the impact of user fees on patients or students.

The price of a fare reduction is relatively small considering the benefits for low-income transit riders in particular, and for our wider economic, social and environmental well-being.

Technical Notes

Transit price elasticities used in this report come from figures provided by two reports. The first is *Fare Review Research / Fare Elasticities*, prepared in March 1997 by the IBI Group for BC Transit, which recommends an elasticity of –0.25 in the short-term. Todd Litman's *Transit Price Elasticities and Cross-Elasticities*, prepared for the Victoria Transport Policy Institute in June 2004, covers a variety of topics including additional information on long-term elasticities.

The Litman study recommends that people use a range of elasticities, and if it is necessary to choose one number, they use the midpoint of the range. Long-term elasticity ranges from –0.6 to –0.9 for a midpoint of –0.75.

To estimate the effects of larger fare reductions, we must compound the effects of a series of 1 per cent reductions. Thus, the impact of a 10 per cent fare reduction is +2.47 per cent on short-term ridership and +7.25 per cent on long-term ridership.

For estimating the impact of fare decreases beyond the 10 per cent reduction, we have reduced the elasticity to reflect the fact that elasticity is lower in cities with higher ridership. For a 20 per cent fare reduction we estimate an increase in ridership of 4.88 per cent in the short-term and 13.98 per cent in the long-term. For a 30 per cent fare reduction we estimate an increase in ridership of 7.23 per cent in the short-term and 20.22 per cent in the long-term.

To forecast the financial impact of a fare reduction on TransLink, we must account for both a reduction in revenues per passenger and the higher costs associated with increased ridership. We have assumed constant per-passenger operating costs, and multiplied the forecasted increased ridership by the constant per-passenger operating costs. Changes in fare revenues are based on the revised fare revenue per passenger and the corresponding increased ridership.

These financial forecasts are sensitive to both the elasticity figures used and the per-passenger operating costs. As elasticities tend to vary widely according to circumstances (as discussed in the paper), the actual ridership effects could vary widely as well.

We note that most elasticity models are based on the impact of a 1 per cent change in fares. As we carry our model well beyond the typical 10 per cent range used for elasticity models, we have erred on the side of caution in assuming that elasticity is lower for larger fare reductions.

As these estimates also assume constant per-passenger operating costs, the actual impact on operating costs would vary depending on whether the whole system becomes more or less cost-effective as the system grows in scale. Some per-passenger costs would decline as relatively empty buses fill with passengers. Some per-passenger costs may increase as a result of using rail transit to attract riders. As a result, we have chosen to assume stable per-passenger operating costs (but lower per-passenger revenue due to the respective fare reduction).

Notes

1 Calculated using figures from the *TransLink 2005 Annual Report*.

2 This data is extrapolated from figures provided in Steve Kerstetter's *Rags and Riches: Wealth Inequality in Canada*. Canadian Centre for Policy Alternatives. 2003.

3 Andrea Long and Michael Goldberg. *Falling Further Behind: A Comparison of Living Costs and Employment and Assistance Rates in British Columbia*. SPARC BC. December 2002. p. 11.

4 Andrew Heisz and Grant Schellenberg. *Public Transit Use Among Immigrants*. Statistics Canada. May 2004.

5 Todd Litman. *Transit Price Elasticities and Cross-Elasticities*. Victoria Transport Policy Institute. June 14, 2004. p. 6.

6 Ibid.

7 *TransLink 2004 Annual Report*, p. 14. This figure includes the cost of expanding the number of transit vehicles, maintaining and expanding transit infrastructure, and the cost of rapid transit capital investment (but excludes replacement of existing buses) using data from the total capital program summary. The *2005 Annual Report* contained less detail on the capital program.

8 Glen Leicester. *2004 Transit Ridership*. Letter to GVTA Board of Directors dated February 24, 2005.

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ACKNOWLEDGEMENTS

The author would like to thank Shannon Daub, David Hendry, Steve Kerstetter, Seth Klein, Marc Lee, Nadene Rehnby and Marion Town for their feedback on various drafts of this report.

Opinions and any errors in this paper are those of the authors, and do not necessarily reflect the views of the Canadian Centre for Policy Alternatives.

Copyedit: Nadene Rehnby | Layout: Avi Goldberg

ISBN: 978-0-88627-535-8

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