



The Economic Impact of Transit Investment in Canada



Public transit is vital to the efficient movement of people and goods throughout Canada, and especially in its cities. Every year, federal, provincial and municipal governments invest billions of dollars to operate, preserve, improve and expand Canada's transit systems. But what is the return on that investment? What is the value of the benefits enjoyed by Canadians?

CUTA has examined these questions regularly over the past fifteen years. Two previous studies, including *The Economic Impact of Transit Investment: A National Survey*, took a wide-ranging and unprecedented look at the economic impacts of Canada's existing investment in transit facilities and services. Using a technique called multiple account evaluation, the study examined the benefits that arose from spending on infrastructure and operations, employment in the industry, and the effects of transit ridership on motor vehicle operating costs, collisions and emissions. The study also included a statistical snapshot of the scale and distribution of current transit investment in Canada, a review of industry and academic literature on the economic benefits of transit, and a compilation of economic evaluations of individual transit projects from across Canada.

This issue paper updates this previous work and provides up to date information for 2018.

RESEARCH HIGHLIGHTS

The economic benefit of Canada's existing transit systems is at least \$19 billion^a annually.

The transit industry directly employs 59,600 Canadians^b and transit capital investment creates an additional 65,000 jobs^c.

Transit reduces vehicle operating costs for Canadian households by about \$12.6 billion annually^d.

Transit reduces the economic costs of traffic collisions by almost \$3.2 billion annually^e.

Transit reduces annual greenhouse gas emissions by 4.7 million tonnes, valued at \$207 million^f.

Transit saves about \$137 million^g in annual health care costs related to respiratory illness.

TRANSIT: A PILLAR OF CANADA'S ECONOMY

Public transit contributes to Canada's economic competitiveness across different scales—from the macro economic impacts of infrastructure investments to the community benefits of improved mobility. Transit also creates benefits for us as a society, by improving sustainability, and for individual households, by reducing the cost of living.

NATIONAL BENEFITS The Canadian transit industry generates jobs, income and wealth for the country's economy. Capital-intensive transit systems generate employment in construction, professional services, research and development, and other areas of the economy. Canada is a major producer and exporter of transit equipment, so a high proportion of transit investment remains in Canada and creates spin-off employment in manufacturing and related industries.

COMMUNITY BENEFITS Public transit boosts the productivity and economic efficiency of cities by enabling them to function smoothly, encouraging more compact development, and enabling the better use of scarce resources including land, energy and financial capital. Transit helps communities reduce the wasteful and economically damaging impacts of congestion, which grow exponentially as congestion levels increase.

The ability of transit investments to influence land use is also important to the fast-growing urban centres that are looking for ways to better manage future growth. The creation of walkable, dynamic urban environments is a more vital objective than ever, as knowledge industries remain a hub of employment growth and as cities look for competitive advantages to help attract new investment. Transit also improves access to the labour pool for employers in large and small communities alike.

SOCIAL BENEFITS Transit investments provide social benefits that extend beyond those traditionally attributed to transportation projects. Transit use reduces emissions from motor vehicle travel, helping to mitigate the impacts of poor air quality on the health of individual Canadians and the costs of providing health care services. By offering a safer alternative to automobile use, it also substantially reduces the number of traffic collisions and related health care costs and lost productivity.

HOUSEHOLD BENEFITS Public transit is an important transportation option for the majority of Canadians who live in urban areas. For people without access to personal motor vehicles, transit provides a way to get to work, school, recreation, shopping and services like healthcare. Commuting by transit is one-third to one-half as expensive as commuting by car in major Canadian cities, and the decision to take transit can give a substantial boost to a family's disposable income.



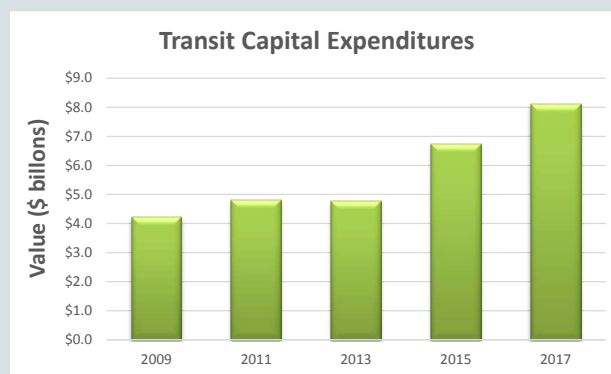
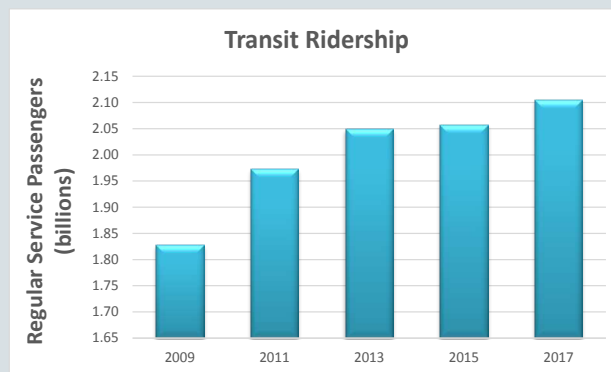
THE SCALE OF TRANSIT IN CANADA

Here are a few figures to help readers understand the scale of supply and demand within Canada's transit industry.

RIDERSHIP In 2017, more than 23 million Canadians lived in areas with transit service. In that year, transit ridership in Canada exceeded 2.1 billion passenger trips, representing an average annual growth rate of 1.6% since 2008^b. In 2016, the Census found that 12.4% of Canadian workers took transit to work, a significant increase from levels in 2006 (11%) and 1996 (10.1%)^h.

SERVICE LEVELS The availability of transit service has increased steadily across Canada in recent years, with the number of revenue vehicle hours growing at an annual average rate of 1.96% from 2008 to 2017^b.

CAPITAL INVESTMENT Capital funding for Canada's transit systems has also grown, both to meet the need for repair and replacement of aging infrastructure and to make up for many years of underinvestment in transit expansion. Total capital investment in 2017 reached \$8.1 billion, up from \$4.2 billion in 2009^b.



EVALUATING THE FULL RANGE OF TRANSIT'S ECONOMIC IMPACTS

For several years, formal evaluations of the economic benefits of major transit projects have been central to investment decisions by Canada's federal and provincial governments. Some of these have used a cost-benefit framework to compare costs and benefits of each project in monetary terms, while others have used a multiple account evaluation approach to evaluate both the identifiable monetary elements as well as additional project costs and benefits (such as environmental, social and community benefits) that cannot be easily expressed in dollars. Sample results from several evaluations of major transit investments using both of these approaches are provided below.

SAMPLE TRANSIT PROJECT EVALUATIONS

Several summaries of recent economic impact assessments for major transit system investments are provided below.

Green Line LRT (Calgary, Alberta): An analysis of costs and benefits to the year 2046 found the project would result in \$4.7 billion of increased property value along the LRT corridor, \$940 million in additional Provincial income tax revenue, \$630 million in additional property tax revenue to the City and the Province, and approximately \$3 million in labour savings due to productivity gains. The Green Line would also create 20,000 direct and indirect jobs from 2017 to 2026^l.

Bus Rapid Transit Evaluation (Saskatoon, Saskatchewan): The project utilized a multiple account evaluation to assess user, financial, environmental, and socio-economic impacts of a BRT system. The evaluation found the project would result in between \$164.9 and \$279.8 million in net benefits and have a benefit-cost ratio of 1.7 to 2.5 (depending on the discount rate used) by 2041^j.

Stage 2 LRT (Ottawa, Ontario): This project used a benefit-cost analysis which quantified transportation-user and environmental benefits to determine the Stage 2 LRT would have a benefit-cost ratio (BCR) of 2.90 (or a BCR of 2.62 if select line extensions were constructed). It was found the project will result in the creation of nearly 22,000 person-years of employment (equivalent to over 850 full-time jobs), a GDP contribution of \$4.5 billion (2018\$), a tax contribution of \$200 million (2018\$), and \$5.5 million (2018\$) in annual operating savings for OC Transpo starting in 2023^k.

BUILDING A NEW PERSPECTIVE ON THE BENEFITS OF TRANSIT INVESTMENT

CUTA's earlier research represented the first use of multiple account evaluation to assess the impacts of public transit on Canada's economy. The analysis measured those impacts by comparing today's situation to an alternative scenario in which transit does not exist, and in which most current transit passengers would be expected to travel by automobile. It uses multiple account evaluation to identify and, where possible, quantify the economic impacts of the differences in travel activity between these two scenarios. The work has been updated using 2017 as the base year for analysis.

The research examines transit's benefits in view of its costs, which for 2017 included total capital investments of \$8.11 billion and total operating expenditures of \$9.95 billion. When operating revenues of \$5.20 billion (principally from fares) are considered, the net operating investment was \$4.75 billion^b.

Four major types of transit benefit are considered by this analysis. The first is economic growth as measured by gross domestic product and employment. The second represents benefits to transportation system users, while the third and fourth represent environmental benefits and social benefits, respectively. The following paragraphs summarize the analytical findings for each category of benefit.

ECONOMIC DEVELOPMENT Transit investment has spin off effects including the creation of jobs, income and taxes through transit operations, construction and manufacturing.

Metric	Annual Impact
Economic output (increase in gross domestic product)	\$6.2 billion ^c
Employment from capital investment	65,000 full-time jobs ^c
Taxes arising from capital investment	\$609 million ^c
Employment from transit operations	57,020 full-time jobs ^c

TRANSPORTATION USER BENEFITS Transit passengers save money by not having to operate an automobile. Transit is also safer than automobile use and reduces death, injury and property damage suffered due to traffic collisions. Transit customers save time by avoiding congested roads, and other road users also benefit from reduced congestion—however, these savings were not quantified due to the extent of additional analysis required.

Metric	Annual Impact
Vehicle operating cost savings	\$12.62 billion ^d
Collision cost savings	\$3.17 billion ^c
Travel time cost savings	Not quantified

ENVIRONMENTAL BENEFITS Transit ridership reduces air pollutants including greenhouse gases and criteria air contaminants (carbon monoxide, volatile organic compounds, nitrous oxides, sulphur oxides and particulate matter). Transit also helps communities develop with a more compact form, reducing land consumption and travel distances—however, these benefits could not be quantified as part of this analysis.

Metric	Annual Impact
Greenhouse gases <ul style="list-style-type: none"> Emissions reduced Value 	4.7 million tonnes \$206 million ^f
Criteria air contaminants <ul style="list-style-type: none"> Emissions reduced Value 	5,520 tonnes \$39.1 million ^f
Benefits of compact community form	Not quantified

SOCIAL AND COMMUNITY BENEFITS By reducing air pollutant emissions and resulting levels of respiratory illness, transit leads to reductions in hospital admissions and the economic costs of health care, lost productivity and loss of life. Customers who walk or cycle to reach transit service also improve their cardiovascular and musculoskeletal health through physical activity—but this analysis did not attempt to quantify the economic value of this benefit.

Metric	Annual Impact
Hospital admissions reduced	182 ^l
Economic damage avoided	\$137 million ^g
Improved health from physical activity	Not quantified

NUMBERS ALONE CANNOT TELL TRANSIT'S STORY

CUTA's research clearly illustrates the positive economic impacts of Canada's transit facilities and services. Through multiple account evaluation it builds a solid understanding of transit's broad economic benefits, including those received by users, the environment and society as a whole.

Clearly, the benefits of transit investment on the economy are huge. The positive impacts on annual vehicle operating costs, collision costs, air pollution and improved respiratory health alone (a total of \$16.16 billion) greatly outweigh transit's annual capital and net operating costs (a total of \$12.86 billion). This is without considering the value of other important benefits related to travel time, land use effects and improved physical activity. While these additional values could not be quantified in this research, they might be measured through further work and could dramatically increase the magnitude of transit's positive impacts.

Transit has even more benefits that could be considered in future evaluations. These include the economic value generated when transit helps people access jobs, education and services that they could not otherwise reach; the money saved by families when the availability of transit allows them to avoid purchasing a second or third automobile; and the wealth generated when successful transit systems help cities attract global investors and tourism. These impacts, and others, also deserve attention.

While this research offers a snapshot of the past, its conclusions will become even more relevant in the future as urbanization, traffic congestion and global economic competition accelerate. As these factors grow over time, so will the rate of return on transit investment. Canadian communities will only reap transit's benefits for competitiveness, quality of life and long-term sustainability if they invest sufficiently in transit operations and infrastructure today. Those communities who fail to invest in their own mobility will be sure to bear very real economic consequences, especially as the availability of frequent and rapid transit networks becomes a higher priority for businesses looking to locate strategically.

In the end, of course, the true economic benefit of transit is much more than a number. As with any attempt to put a price tag on the value of individual health and happiness, or on the value of prosperous and sustainable communities, CUTA's research can only tell part of the story. Ultimately, the value of investing in transit today will reach every corner of the nation tomorrow, and every generation of Canadians to come.

References:

- a. Sum of economic, transportation, environmental, social and community benefits described in this report
- b. CUTA 2017 Canadian Conventional Transit Statistics
- c. Applied Statistics Canada input/output multipliers to capital expenditures from 2017 CUTA Canadian Conventional Transit Statistics
- d. Regular service passenger kms (CUTA 2017 Canadian Conventional Transit Statistics) multiplied by \$0.64 per km to operate an intermediate sized vehicle in 2018 (Canadian Automobile Association)
- e. Incident rate of accidents (Canadian Motor Vehicle Traffic Collision Statistics: 2016 (values projected for 2017)) multiplied by average cost of accidents (Transport Canada Accidents Analysis and Estimation of the Social Cost of Motor Vehicle Collisions in Ontario: 2004 (values adjusted for inflation to 2017)) and regular service passenger km (CUTA 2017 Canadian Conventional Transit Statistics)
- f. Average vehicle emission per year (ICCT Roadmap Model, 2012) multiplied by total vehicle km (CUTA 2017 Canadian Conventional Transit Statistics) and cost per tonne of pollutants (UK Air quality damage cost guidance, 2019, and ECCO Technical Update to Environment and Climate Change - Canada's Social Cost of Greenhouse Gas Estimates 2016)
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- l. Hospital admissions due to poor air quality (http://www.cma.ca/multimedia/cma/content/Images/Inside_cma/Office_Public_Health/ICAP/CMA_ICAP_sum_e.pdf) multiplied by share of air contaminant emissions attributable to transportation and the share of light vehicles out of total mobile sources of air contaminants (A study on Air Pollutant Emissions for Ontario)



The Canadian Urban Transit Association (CUTA) is the voice of Canada's public transit industry. For additional information including research reports, industry updates, news bulletins and more, please contact us or visit our website.



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