

2008-2012 Infrastructure Needs for Canadian Transit Systems

Christopher Norris, P.Eng.  
Canadian Urban Transit Association

Paper prepared for presentation

at the *Urban Transit: What Is Really Needed for a Sustainable Future?* Session

of the 2008 Annual Conference of the  
Transportation Association of Canada  
Toronto, Ontario

## **ABSTRACT**

The fifth edition of the Canadian Urban Transit Association's (CUTA) transit infrastructure needs survey has estimated the infrastructure requirements of transit systems across the country to be \$40.1 billion for the period 2008–2012.

Canada's infrastructure needs over the period include bus, subway, LRT and commuter car purchases and refurbishment, development and construction of fixed guideways and rights-of-way such as BRT and LRT, new and improved maintenance facilities, stations and terminals, new park and ride facilities, the implementation of transit priority measures, new customer amenities.

Transit systems were asked to list their budgeted capital infrastructure needs for the next five years (2008–2012) by dollar value. These were categorized by expenditures for replacement or rehabilitation, expenditures for expansion in response to population growth or promotion of new ridership; expenditures currently planned (under existing funding programs) and additional needs that can only be met through new external investment.

The need for investment in transit is real as currently many transit systems are operating at or beyond their design capacity, and some systems are facing significant latent demand that cannot be satisfied without major investment in service improvement and capacity expansion. Additional pressures are also being put onto transit systems as they are expected to play an increasingly important role in ensuring access and mobility for Canada's urban communities today and into the future.

# **PAPER**

## ***INTRODUCTION***

The Canadian Urban Transit Association (CUTA) is the voice for enhancing the public transit industry in Canada. Representing 120 transit systems from coast to coast, its mission is to establish public transit as the primary solution to urban mobility in the achievement of sustainable transportation, and to assist its members in the fulfillment of their mandates.

In 2006, over 1.7 billion<sup>1</sup> trips were made on public transit in Canada on 13,317 buses, 613 light rail vehicles, 1,437 heavy rail vehicles (subway) and 629 commuter rail vehicles. To accomplish this, these transit vehicles operated over 37 million revenue service hours and 870 revenue kilometres.

Since 1999, the CUTA conducts an infrastructure needs survey of Canadian Transit Systems every two years. In late 2007, CUTA surveyed all of its transit system members, asking them to detail their capital infrastructure needs for the next five years. Submissions were received from 72 systems, representing 95% of total Canada-wide transit operations according to annual operating costs.

## ***SURVEY METHODOLOGY***

The survey methodology employed to determine Canadian transit systems infrastructure needs has remained constant since the first survey in 1999.

Surveys are sent to all CUTA member transit systems, where they are asked to list their budgeted capital infrastructure needs for the next five years by dollar value.

There are two main categories in which transit systems can list their expenditures: infrastructure replacement and rehabilitation and infrastructure for expansion or ridership growth.

Infrastructure replacement and rehabilitation is defined as new, upgraded or refurbished vehicles for replacement purposes only and the upgrading or replacement of existing facilities. In contrast, infrastructure for expansion or ridership growth is new infrastructure required to meet growing demand or new services.

These two main categories are then further divided to paint a clearer picture of what is required in the next five year period.

The infrastructure replacement and rehabilitation sub-categories are:

- Bus Purchases or Refurbishment: Acquisition of new buses or refurbishment of existing buses, for replacement only, including projects to convert existing fleets to alternate fuels.

- Other Rolling Stock: Acquisition of other vehicles for replacement, such as light rail or heavy rail (please specify).
- Fixed Guideway or Rights-of-Way: Upgrading or replacement of existing rail or dedicated bus rights-of-way.
- Maintenance Facilities: Upgrading or replacement of garage and equipment maintenance facilities.
- Other: This includes fare boxes, bus stops, bus shelters, etc, for replacement purposes only.

For *infrastructure for expansion or ridership growth* is new infrastructure required to meet growing demand or new services.

- Bus Purchases: Acquisition of new buses for system expansion (new routes and service increases).
- Other Rolling Stock: Acquisition of other vehicles for expansion, such as light rail or heavy rail (please specify).
- Fixed Guideway Construction or Enhancement: Extension of existing or construction of new rail or dedicated bus facilities (does not include transit-only lanes on existing streets). This includes capacity expansion such as double-tracking or grade separation projects designed to accommodate higher traffic volumes.
- Stations or Terminals: Construction of new stations, terminals or interchanges, including intermodal facilities.
- Parking Facilities: Construction of new or expansion of existing commuter parking facilities at stations, terminals or interchanges.
- Transit Priority Measures: Infrastructure designed to give transit vehicles priority over the regular traffic flow, e.g. queue jumpers, traffic signal priority, transit-only lanes on existing streets.
- Customer Amenities: Bus stop enhancements, shelters, signage, etc.
- Maintenance Facilities: New garage and equipment maintenance facilities required for system expansion.
- Advanced Technology: Implementation of advanced technology systems, such as automatic vehicle location, advanced fare collection and customer information systems (please specify).
- Other: This includes fare boxes and other fare equipment, support vehicles, etc.

The expenditures are also categorized by funding: currently planned and contingent on external funding. Expenditures that fall under “current plans” are projects and procurement that can be funded under existing programs, be it federal and/or provincial, while when categorized under “contingent on external funding”, these are needs that could only be met through new external investment.

To compensate for systems that did not reply or could not provide data, total direct operating expenses from the previous year, recorded in the Canadian Transit Fact Book<sup>2</sup>, are extrapolated from missing systems.

### ***MOST RECENT RESULTS***

Responses were received from 72 Canadian transit systems, representing 95% of total Canada-wide transit operations according to annual operating costs. The needs for transit capital and infrastructure were reported to total \$40.1 billion as shown in Table 1.

Of the \$40.1 billion total identified for transit infrastructure, approximately \$11.8 billion, or 29%, is needed to replace or rehabilitate existing infrastructure, while approximately \$28.3 billion is for expansion, to respond to population growth or for ridership increases.

Of the \$11.8 billion of the funds required to replace or rehabilitate existing infrastructure, \$9.2 billion (78%) was reported as part of current plans. Moreover, the balance, \$2.5 billion or 22%, is contingent on new funding. Replacement and rehabilitation needs are the minimum investments necessary simply to keep the country's transit systems in a state of good repair.

As we further examine the replacement and rehabilitation needs, approximately \$2.7 billion will be required to maintain bus fleets at their current levels, which stood at 13,317<sup>1</sup> with an average age of 9.6 years<sup>1</sup> in 2006. Bus replacement and refurbishment needs are for bigger systems, such as Vancouver's TransLink or Ottawa's OC Transpo, but smaller systems such as Metrobus in St. John's, Newfoundland and Labrador that has an average fleet age of 16.4 years<sup>1</sup>.

Close to \$3.5 billion is identified to maintain other rolling stock, such as subways, light rail and commuter rail equipment. Such significant investments in other rolling stock are the subway and streetcar (234 units) purchases at the TTC and Montréal's STM purchase of new metro cars, replacing cars that were put into service in 1967.

Finally, \$2.9 billion will be needed to replace or rehabilitate existing fixed guideways or rights-of-way. Significant investments will also be needed to replace or refurbish maintenance facilities and other items including fare collection equipment, terminals and software to improve or implement intelligent transportation systems.

While transit systems reported they need an estimated \$28.3 billion for expansion projects, close to two-thirds of these remains unfunded. For transit systems to prepare for population growth and fulfill their mandates to increase ridership, approximately \$17.4 billion of new investment will be necessary.

Transit systems have indicated that their top three priorities to accommodate expansion and future growth within the next five years are fixed guideway construction or enhancement, maintenance facilities, other rolling stock such as subway cars, and bus purchases. Some of these projects are from Ontario's

MoveOntario 2020<sup>3</sup> projects, such as TTC's Spadina subway extension into York Region and Brampton's Acceleride project, from British Columbia's Provincial Transit Plan<sup>4</sup>, such as the Canada Line in Vancouver and Kelowna's new BRT system, and Gatineau's new Rapibus system.

The new projects are reflections of many transit systems are operating at or beyond their design capacity, and some systems are facing significant latent demand that cannot be satisfied without major investment in service improvement and capacity expansion. Additional pressures are also being put onto transit systems as they are expected to play an increasingly important role in ensuring access and mobility for Canada's urban communities today and into the future.

## ***HISTORICAL TRENDS***

Discernable trends are visible within the data that has been collected through the surveys since 1999.

The total needs are over \$40 billion for the 2008-2012 period, a level approximately four times higher than the first recorded period (1999), as shown in figure 1. The figure also reflects the evolution of public transit in society as awareness of its benefits, growing demand and expansion are contemplated.

This same figure also illustrates the proportions of the total infrastructure needs that are currently planned versus contingent on external funding.

The 2004- 2008 and 2006-2010 surveys showed that the share of investments contingent on new external funding continues to decrease. For this latest survey, the current and contingent investments each represented about half of the total, as was in the 2002-2006 survey.

More importantly, the absolute value of the projects in current plans has increased in recent years. This may be the result of increasing federal and provincial government commitments, including funds transferred from the federal gas tax which can be used for transit investments. The projects contingent on new funding reflect the need for increased capacity as cities continue to grow and transit is called upon to increase ridership and its modal share.

It is important to remember that most transit infrastructure projects are long term and as more funding arrangements become available, more transit systems will come to rely on them to plan for future replacement or expansion needs.

The proportion of rehabilitation and expansion needs is presented in Figure 2. As expansion needs continue to outweigh rehabilitation needs, both categories remain important in providing quality transit services to the public.

## ***IMPACTS***

The latest results of Canadian transit systems infrastructure needs continues to demonstrate the need for large-scale, sustained investment in urban transit infrastructure, both for renewal and for expansion.

Financially, investments for expansion and ridership growth are greater than rehabilitation and replacement, but both remain important. This also reflects urban and rural areas recognizing the need of sustainable transportation and communities. Longer term plans are being developed where transportation and land-use planning work together to ensure higher quality living for their residents and businesses.

The benefits of investing in transit remain clear: traffic congestion management for moving people and goods, which also translate into increase economic benefits and efficiencies through reduced congestion, increased health through reduced fuel consumption and a higher quality of life.

Within the past year, Canadians citizens and businesses are demanding cities with a high quality of life, where people and goods move freely, with affordable housing, clean air and reliable community services, including efficient public transit. Optimizing the economic, environmental and social benefits of public transit will require meeting the infrastructure needs outlined in this report. That, in turn, will require a long-term, sustainable investment stream from all orders of government that permits transit systems to plan effectively and systematically.

# FIGURES

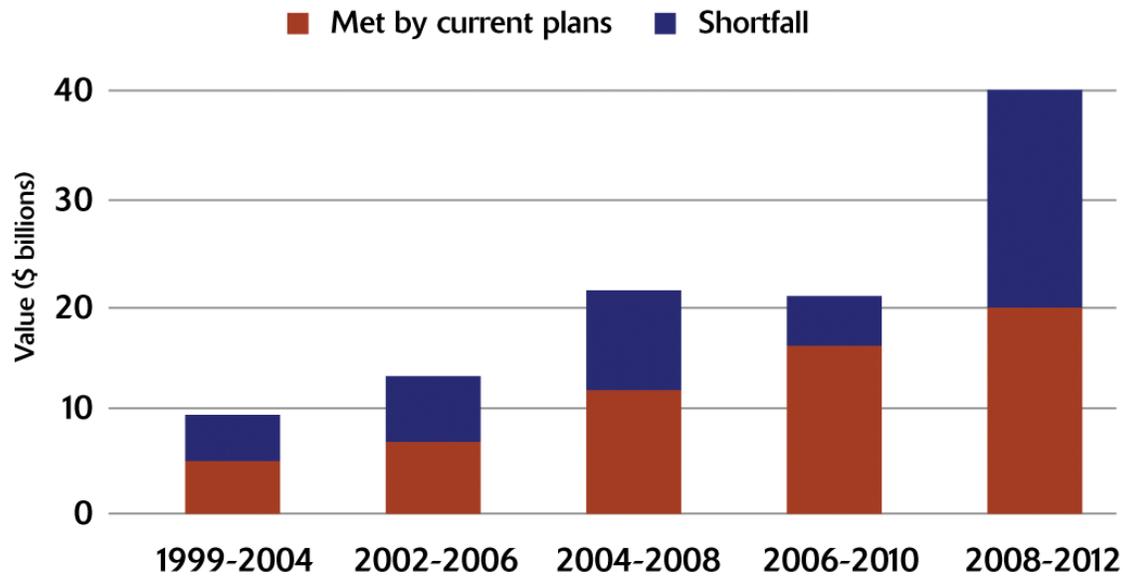


Figure 1. Historical Canadian Transit System Infrastructure Needs

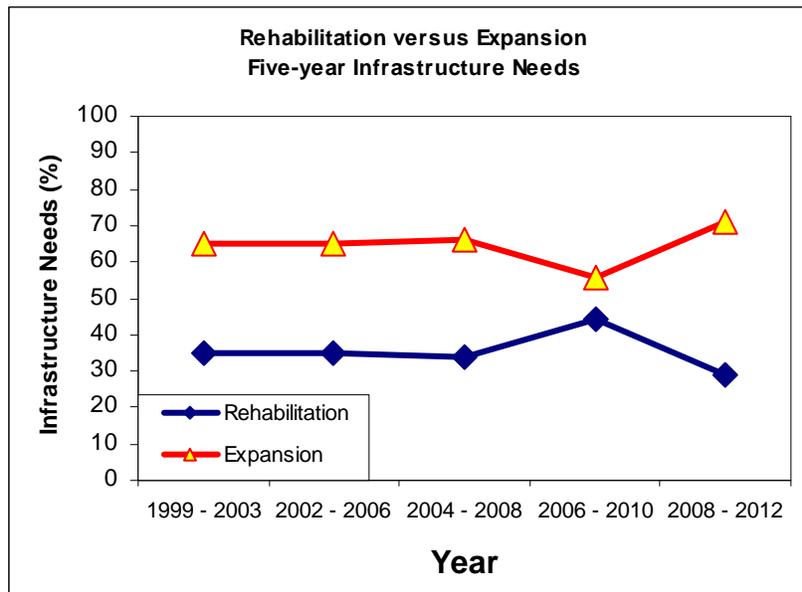


Figure 2. Proportion of rehabilitation and replacement versus expansion projects.

## TABLES

Infrastructure Rehabilitation and Replacement	Current Plans	Contingent on External Funding	Total
Bus Purchase or Refurbishment	\$2,307,950,403	\$404,215,881	\$2,712,166,284
Other Rolling Stock	\$3,387,008,124	\$81,075,903	\$3,468,084,027
Fixed Guideway or Rights-of-Way	\$1,408,322,596	\$1,521,406,714	\$2,929,729,310
Maintenance Facilities	\$1,014,472,265	\$321,031,353	\$1,335,503,618
Other	\$1,108,393,299	\$214,302,963	\$1,322,696,262
<b>TOTAL</b>	<b>\$9,226,146,686</b>	<b>\$2,542,032,815</b>	<b>\$11,768,179,501</b>
Infrastructure for Expansion or Ridership Growth	Current Plans	Contingent on External Funding	Total
Bus Purchases	\$1,534,828,787	\$588,462,001	\$2,123,290,788
Other Rolling Stock	\$1,232,121,418	\$883,331,054	\$2,115,452,472
Fixed Guideway Construction or Enhancement	\$4,431,198,006	\$12,809,448,154	\$17,240,646,160
Stations or Terminals	\$826,967,272	\$733,243,402	\$1,560,210,674
Parking Facilities	\$251,186,139	\$382,359,130	\$633,545,269
Transit Priority Measures	\$198,435,716	\$330,852,333	\$529,288,049
Customer Amenities	\$105,641,723	\$83,466,869	\$189,108,592
Maintenance Facilities	\$1,171,284,795	\$1,363,309,229	\$2,534,594,024
Advanced Technology	\$519,847,898	\$212,453,974	\$732,301,872
Other	\$586,685,542	\$61,519,087	\$648,204,629
<b>TOTAL</b>	<b>\$10,858,197,296</b>	<b>\$17,448,445,234</b>	<b>\$28,306,642,530</b>
<b>GRAND TOTAL</b>	<b>\$20,084,343,982</b>	<b>\$19,990,478,049</b>	<b>\$40,074,822,030</b>

Table 1. Canadian Transit Infrastructure Needs 2008–2012

## REFERENCES

---

- <sup>1</sup> Canadian Urban Transit Association, “Canadian Transit Fact Book, 2006 Operating Data”, Toronto; October 2007
- <sup>2</sup> Canadian Urban Transit Association, “Transit Infrastructure Needs for the Period 2008-2012”, Toronto; February 2008
- <sup>3</sup> Government of Ontario, Ministry of Transportation, “MoveOntario 2020”, <http://www.premier.gov.on.ca/news/Product.asp?ProductID=1384>, Toronto, 2007
- <sup>4</sup> Government of British Columbia, Ministry of Transportation, “Provincial Transit Plan”, [http://www.th.gov.bc.ca/Transit\\_Plan/index.html](http://www.th.gov.bc.ca/Transit_Plan/index.html), Victoria, 2007