## Abstract

The Canadian Transit Infrastructure Needs Report is published biannually and documents the funded and unfunded infrastructure needs of transit systems over a five-year period.

### Key Words

- Urban Transit; Infrastructure Needs, Funding, Government

### Language

- RTS-15-12E: English
- RTS-15-12F: French

(This report is also available in French.)
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Background

The Canadian Urban Transit Association has conducted biannual transit infrastructure needs surveys since 1999. In the 1990s, transit systems across the country came under unprecedented financial pressure as overall government investment dropped sharply. Over the past several years, all levels of government have embraced transit as a way to manage increasing congestion in Canadian cities, ensure Canada’s economic competitiveness and reduce carbon emissions.

For the last decade and a half CUTA has conducted regular reviews of the infrastructure needs of Canadian Transit. These reviews take place every two years and cover a five year period. These reviews of examine the needs for Replacement or Rehabilitation and for Expansion, and where these are funded and unfunded.

This, its eighth edition, presents the results of the latest analysis of needs, and covers the period 2014-2018.
Executive Summary

Canadian Transit Infrastructure Needs – 8th edition
For the Period 2014-2018

Canada’s transit infrastructure needs continue to increase from the 1999-2003 baseline, with this most recent survey of infrastructure needs estimating the requirements of transit systems across the country to be $56.6 billion for the period 2014-2018.

Of importance is that an increasing proportion of transit infrastructure needs are not met by existing funding programs. It is expected that $38.1 billion, or 67%, of infrastructure needs will be met by existing programs over the 2014-2018 period, while $40 billion, or 75%, of infrastructure needs were met by existing programs over the 2012-2016 period. This is a reflection of the need for increased investment commitments by government at all levels.

Of the $56.6 billion total required, $15.9 billion, or 28%, is needed to Rehabilitate or Replace existing infrastructure, while $40.7 billion, or 72%, has been identified for infrastructure that promotes Expansion. These figures indicate that, while the need for Rehabilitation & Replacement remains important, transit systems across Canada continue to focus on expanding services to meet growing mobility needs.

Transit Infrastructure Needs 2014-2018 ($billion)

To obtain this information CUTA surveys all transit system members with respect to capital infrastructure needs every two years for the next five year period. For the 2014-2018 needs period, submissions were received from 60 transits systems, representing 96% of total Canada-wide transit operations according to annual operating costs.
Methodology

CUTA continues to use the same methodology to determine the infrastructure needs of the Canadian transit industry over a five year-period, thus ensuring consistent reporting and comparison. Surveys are sent to all CUTA transit systems members, who are asked to provide their budgeted capital infrastructure needs for the next five years (2014-2018) by dollar value. The needs are categorized by:

- Rehabilitation & Replacement
- Expansion in response to population growth
- Infrastructure Needs that will likely be met through existing funding programs
- Infrastructure Needs that could only be met through additional funding

The infrastructure needs are further categorized by type:

- Buses purchases or refurbishment
- Other rolling stock — including heavy or light rail vehicles;
- Fixed guideways or rights-of-way
- Maintenance facilities
- Stations or terminals
- Parking facilities — for commuters at stations, terminals or interchanges
- Transit priority measures — infrastructure designed to give transit vehicles priority over other traffic flow
- Customer amenities — including bus stop enhancements, shelters, signage, etc
- Advanced technology — such as automatic vehicle location, advanced fare collection and customer information systems
- Other infrastructure, which varied by responses; and,
- The relative priority of each of infrastructure need within their community.

Submissions were received from 60 systems, representing 96% of total Canada-wide transit operations according to annual operating costs.
$56.6 Billion Needed for Transit Infrastructure Projects

Canadian transit systems reported $56.6 billion in infrastructure needs for the period 2014-2018. This marks a $1.3 billion increase over the prior period, 2012-2016\(^1\).

The reported $56.6 billion includes both infrastructure projects for which funding has already been allocated and those projects that are currently unfunded and can only be completed if additional funding were made available. Funded projects make up $38.1 billion, or 67%, of infrastructure needs, while unfunded projects make up $18.5 billion, or 33%.

Both funded and unfunded infrastructure needs include projects for Rehabilitation & Replacement as well as for Expansion. Figures 1 and 2 show the breakdown of total Canadian infrastructure needs for the current and prior period.

The majority of transit infrastructure needs remain funded despite the increase in overall infrastructure needs. However the rate at which transit infrastructure needs are funded for the next 5-year period has declined from 75% to 67% since 2012-2016. While the gap in funding for Rehabilitation & Replacement improved slightly since 2012-2016, the gap in funding for Expansion increased almost 50%, from 21% in 2012-2016 to 30% for 2014-2018. This illustrates an increasing need for additional funding for Expansion initiatives which address increasing mobility needs in communities.

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\(^1\) adjusted for inflation
Types of Transit Infrastructure Needs 2014-2018

Millions 1

<table>
<thead>
<tr>
<th>Rehabilitation &amp; Replacement</th>
<th>Funded</th>
<th>Unfunded</th>
<th>Total R&amp;R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Purchase or Refurbishment</td>
<td>$ 2,819</td>
<td>$ 235</td>
<td>$ 3,054</td>
</tr>
<tr>
<td>Other Rolling Stock</td>
<td>$ 2,836</td>
<td>$ 31</td>
<td>$ 2,867</td>
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<tr>
<td>Fixed Guideway / Right of Way</td>
<td>$ 3,684</td>
<td>$ 1,091</td>
<td>$ 4,774</td>
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<tr>
<td>Maintenance Facility</td>
<td>$ 2,284</td>
<td>$ 118</td>
<td>$ 2,403</td>
</tr>
<tr>
<td>Other</td>
<td>$ 2,638</td>
<td>$ 147</td>
<td>$ 2,784</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$ 14,261</td>
<td>$ 1,621</td>
<td>$ 15,883</td>
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</table>

<table>
<thead>
<tr>
<th>Expansion</th>
<th>Funded</th>
<th>Unfunded</th>
<th>Total Expansion</th>
</tr>
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<td>Bus Purchase or Refurbishment</td>
<td>$ 784</td>
<td>$ 207</td>
<td>$ 991</td>
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<tr>
<td>Other Rolling Stock</td>
<td>$ 1,436</td>
<td>$ 862</td>
<td>$ 2,298</td>
</tr>
<tr>
<td>Fixed Guideway / Right of Way</td>
<td>$ 13,895</td>
<td>$ 9,487</td>
<td>$ 23,382</td>
</tr>
<tr>
<td>Station/Terminal</td>
<td>$ 1,108</td>
<td>$ 173</td>
<td>$ 1,281</td>
</tr>
<tr>
<td>Parking Facilities</td>
<td>$ 603</td>
<td>$ 56</td>
<td>$ 659</td>
</tr>
<tr>
<td>Transit Priority Measures</td>
<td>$ 2,498</td>
<td>$ 5,646</td>
<td>$ 8,144</td>
</tr>
<tr>
<td>Customer Amenities</td>
<td>$ 119</td>
<td>$ 17</td>
<td>$ 136</td>
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<tr>
<td>Maintenance Facilities</td>
<td>$ 2,340</td>
<td>$ 286</td>
<td>$ 2,626</td>
</tr>
<tr>
<td>Advanced Technology</td>
<td>$ 298</td>
<td>$ 23</td>
<td>$ 321</td>
</tr>
<tr>
<td>Other</td>
<td>$ 763</td>
<td>$ 86</td>
<td>$ 850</td>
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<tr>
<td>TOTAL</td>
<td>$ 23,844</td>
<td>$ 16,843</td>
<td>$ 40,688</td>
</tr>
</tbody>
</table>

GRAND TOTAL $ 38,106 $ 18,465 $ 56,570

Table 1 outlines the breakdown of projects into the sub-categories: Rehabilitation & Replacement projects total $15.8 billion, or 28%, and Expansion projects total $40.7 billion, or 72%.

- Fixed guideways represents the highest value component, especially for Expansion
- Transit priority measures, rolling stock, maintenance facilities at the Rehabilitation & Replacement and Expansion level and bus purchases/refurbishment continue to remain critical priorities.

1 Not all transit systems had planned their infrastructure projects up to 2018 by the survey deadline and did not list all the projects that would be possible due to new funding programs since cost estimates had not been confirmed. Responses were received from 60 Canadian transit systems, representing 98% of total Canada-wide transit operations according to annual operating costs.

Significant Note: At the time of publication AMTs reported needs decreased $7 billion 2012-2016 and 2014-2018; we expect that this may be due to pending restructuring that underway at the time of publication, and that the needs still, and will resurface through other organizations by the time of the next infrastructure Needs report in 2016. If the full $7B is still required but under different transit governance, the total Canadian Transit Infrastructure needs would be $63B.
Expansion vs. Rehabilitation & Replacement Needs

Expansion Infrastructure Needs

Of the $56.6 billion needs for transit infrastructure in 2014-2018, $40.7 billion, or 72%, is needed for Expansion while $15.8 billion, or 28%, is required by Rehabilitation & Replacement (Fig. 3). The focus on Expansion reflects the demand for expanded and new transit services in communities across the country.

Fig. 3 Rehabilitation and Replacement vs. Expansion

Of the reported $40.7 billion needed for Expansion, $23.8 billion, or 42%, are part of funded projects (Fig. 4). An additional $16.8 billion remains unfunded and additional funding will be necessary for transit systems to complete these projects to accommodate increase transit ridership demands.

Canadian transit ridership continues to surpass the landmark 2 billion trips taken in 2012, with a steady growth rate of 1.27% per year. In 2013, transit systems reported 2.04 billion trips, or 82 trips per capita.

Fig. 5 Expansion Needs by Type

- Bus
- Other Rolling Stock
- Fixed Guideway / Right of Way
- Station/Terminal
- Parking Facilities
- Transit Priority Measures
- Customer Amenities
- Maintenance Facilities
- Advanced Technology
- Other
Expansion needs are greater in some infrastructure categories than others (Fig. 5). The top priority for 2014-2018 continues to be fixed guide way construction or enhancement, representing $14 billion, or 58%, of the required investment. Over the 2012-2016 period, fixed guide way construction accounted for $23 billion (unadjusted), or 60%, of total expansion related infrastructure needs. For the 2014-2018 period, other priorities for Expansion are Transit Priority Measures, Maintenance Facilities and other Rolling Stock, such as subway cars and rail vehicles.

**Replacement & Rehabilitation Infrastructure Needs**

Transit systems reported $15.9 billion in infrastructure needs for Replacement & Rehabilitation of existing infrastructure. Over $14.3 billion, or 90%, of this amount is currently funded (Fig. 6). The remaining $1.6 billion, or 10%, is unfunded and requires additional funding for project completion. Replacement & Rehabilitation needs demonstrate the minimum investment necessary to keep Canada’s transit system infrastructure in a state of good repair.

The types of infrastructure in need of Rehabilitation & Replacement are illustrated in Figure 7. In addition to prioritizing fixed-guideways and right of way infrastructure projects, needs for Rehabilitation & Replacement projects are also focused on fixed-guideways and right of way infrastructure. $4.8 billion, or 30% of designated funding for Rehabilitation & Replacement projects, is currently required to maintain or rehabilitate older fixed guideways or right of way infrastructure. Other priorities for Rehabilitation & Replacement projects include: bus purchase or rehabilitation ($3 billion) and rolling stock, such as subway, streetcar and light rail ($2.8 billion).

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**Fig. 6 Rehabilitation and Replacement Needs**

- **Funded**: 90%
- **Unfunded**: 10%

**Fig. 7 Rehabilitation & Replacement Needs by Type**

- **Bus**: 18%
- **Other Rolling Stock**: 19%
- **Fixed Guideway / Right of Way**: 18%
- **Maintenance Facility**: 15%
- **Other**: 30%
The focus on fixed-guideway and right of way infrastructure for the 2014-2018 Rehabilitation & Replacement needs is in contrast to the needs reported for the 2012-2016 period. During the prior period, needs showed maintenance facilities as having the greatest Rehabilitation & Replacement needs at $3.2 billion, closely followed by investments in the “other” category, including fare collection equipment, terminals, and software to improve or implement intelligent transportation systems at $3.1 billion. In contrast, maintenance facilities $2.4 billion in 2014-2018 period is similar to prior periods.

**Funded vs. Unfunded Infrastructure**

Of the total infrastructure needs for 2014-2018, over $38.1 billion, or 67%, were reported for funded projects, and $18.5 billion, or 33%, were identified as unfunded and possible only with new, additional funding investment (Fig. 8).

**Funded Projects**

Of the funding currently available for transit infrastructure needs, over $14.3 billion, or 37%, is needed for Rehabilitation & Replacement of existing equipment and facilities, and $23.8 billion or 63%, is needed for transit systems expansion in order to meet the needs of growing communities.

A further breakdown of funded projects shows that fixed-guideway construction or enhancement account for the largest share of currently funded projects at $17.6 billion, or 46%, of both funded Rehabilitation & Replacement and Expansion projects. Bus and other rolling stock purchases and rehabilitation, maintenance facilities and projects listed in the “other” category account for $15.9 billion, or 42% of the remaining projects that are currently funded (Fig. 9).
Unfunded Projects

Of the $18.4 billion of infrastructure projects that are currently unfunded, $16.8 billion, or 91%, are projects that will allow transit systems to expand their operations. Only $1.6 billion, or 9%, or the total of unfunded projects are categorized as Rehabilitation & Replacement projects (Fig. 10).

Figure 11 indicates that 57%, or $10.6 billion, of the additional funding needed would be slated to fund fixed-guideway construction. Additional projects making up 36%, or $6.7 billion, of needs that require additional funding include: bus purchases/rehabilitation, transit priority measures, maintenance facilities and projects listed under the “other” category.
Service Area Population Size and Infrastructure Needs

Canada’s three metropolitan centres (Greater Vancouver, Toronto and Montreal) report the greatest infrastructure needs in Canada, totalling $31.7 billion, or 56%, of total Canadian needs (Fig. 13). However what’s notable for 2014-2018 is the significantly increasing needs for transit infrastructure among mid-sized cities (Group B populations 400 thousand - 2 million). The infrastructure needs of all transit systems operating in the country’s cities and regions with populations greater than 400,000 residents account for 96% of the national total.

Table 2. Percentage of Infrastructure Needs by Population Group

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</thead>
<tbody>
<tr>
<td>Group 1 (Population &gt; 2 million)</td>
<td>77%</td>
<td>81%</td>
<td>56%</td>
</tr>
<tr>
<td>Group 2 (Population 400,001 – 2 million)</td>
<td>20%</td>
<td>16%</td>
<td>40%</td>
</tr>
<tr>
<td>Group 3 (Population 150,001 – 400,000)</td>
<td>3%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Group 4 (Population 50,000 – 150,000)</td>
<td>1%</td>
<td>1%</td>
<td>.8%</td>
</tr>
<tr>
<td>Group 5 (Population &lt; 50,000)</td>
<td>1%</td>
<td>1%</td>
<td>.9%</td>
</tr>
</tbody>
</table>

These findings reveal a trend in which the largest population groups are reporting the greatest infrastructure needs. The data in Table 2 illustrates the correlation between population size and size of infrastructure needs.

When looking at the infrastructure needs by population group on a per capita basis, the relationship between greater population sizes and infrastructure needs continues. Transit systems in Population Group 1 spend, on average, almost 40% more per resident annually than those in population Group 2. This discrepancy increases when comparing Population Groups 2 and 3, where transit systems in Group 2 spend more than 2000% more per resident, on average annually, than systems in Group 3. Over the period 2014-2018, the reported infrastructure needs per capita for Group 5, representing small and rural communities, is greater than for Group 4 (Fig. 14).
On average, the infrastructure needs of all transit systems serving communities with more than 50,000 focus on the Expansion of their current operations. Group 5, representing communities with less than 50,000 residents is the only population group to focus its infrastructure needs primarily on Rehabilitation & Replacement. Of the Group’s needs, $293 million, or 55% of the group’s total needs, fall into the Rehabilitation & Replacement category (Fig. 15).

Although the focus of smaller communities in Group 5 seems to be on Rehabilitation & Replacement, it is also important to note that only $7 million, or 2%, of the Rehabilitation & Replacement projects remain unfunded while $41 million, or 21%, of Expansion projects remain unfunded for this group. This shows that transit is thriving in Canada’s small communities and additional funding is necessary in order to meet growing demands. Mobility needs of Canada’s smaller communities cannot be neglected. The overall required investments are proportionally small; however the benefits and impacts that are linked to the investments at the local level are significant.
**National Trends – Infrastructure Needs**

Transit capital investment requirements in Canada have developed over the past decade as Federal, Provincial and Municipal governments increase their investments in public transit, ensuring that people and goods move freely in a highly competitive economic environment. Figure 16, presents the total infrastructure needs from 1999 to 2018. The total infrastructure needs for the period 2014-2018 is $56.6 billion, more than a $1.8 billion increase over the $53 billion reported for 2012-2016.

![Fig. 16 Funded vs. Unfunded Projects (CPI Adjusted for 2014)](chart)

Figure 16 also illustrates the proportion of infrastructure needs funded by existing funding programs and those which are unfunded and require additional funding. Transit infrastructure needs that require additional funding have increased by 37% in 2014-2018 over the needs reported for 2012-2016. Of those projects that are unfunded $16.8 billion, or 91%, fall into the expansion category. This demonstrates that the needs for Rehabilitation & Replacement projects are well covered by current funding programs, however, there is a substantial need for funding Expansion projects (Fig. 17).

![Fig. 17 Expansion vs. Rehabilitation and Replacement Projects (CPI Adjusted for 2014)](chart)

Transit investment needs for expansion have grown at a greater pace than the needs for Rehabilitation & Replacement projects. In fact, the overall proportion of needs for Rehabilitation & Replacement has decreased from 35% reported for 1999-2003 to 28% reported for 2014-2018.
National Trends – Government Capital Funding

Government funding of capital transit projects has continued to grow over the past decade, reaching a high of over $4 billion in 2010, as illustrated in Figure 18. Government capital funding includes funding at the federal, provincial and municipal levels. Due to the division of responsibilities between these levels of government, the majority of transit funding comes from provincial governments. Figure 18 also shows a trend line denoting the capital expenses of transit systems for the same period.

However, if the transit capital investment trend continues to grow at the same rate, the transit infrastructure needs identified in the 2014-2018 period will still lack funding to meet the needs requiring additional funding by 2018 (Fig. 19).
Examples of Infrastructure Needs

Expansion Projects

Expansion projects include the expansion of physical infrastructure, as well as additional buses and other rolling stock. Expansion initiatives are planned in communities across Canada. Some examples include:

- New bus purchases to expand a fleet in Lethbridge, AB ($2.3 million)
- Expansion of the Toronto-York Spadina Subway Extension in York Region, ON ($1.1 billion)

Rehabilitation and Replacement Projects

Rehabilitation and replacement projects include any projects that help keep current infrastructure at its optimal state. The following examples of Rehabilitation and Replacement projects include those projects that are currently funded and those which need additional funding for their completion:

- Refurbishment of 6 vehicles in Brampton, ON ($600 thousand)
- Technology (PRESTO and radio) upgrades in York Region, ON ($1.2 million)
- Bus stop accessibility projects in Lethbridge, AB ($500 thousand)

Funded Projects

Funded Replacement & Rehabilitation initiatives and Funded Expansion initiatives also occur across the country. Examples of these infrastructure initiatives include:

- PRESTO automated fare collection and other transit technology for York Region, ON ($41 million)
- Cameras on buses in Cornwall, ON ($50 thousand)
- 8 double decker conventional buses and 9 specialized transit buses in Strathcona, AB ($8.5 million)
- 11 buses in St. John’s, NF ($5 million)

Unfunded Projects

Projects that are currently unfunded are only possible with additional funding. Examples of these projects include:

- Transit priority measures in Brampton, ON ($85 million)
- 84 Stations for Phase 2 of the Highway 2 BRT project in Durham, ON ($21 million)
- Demand/Response technology for Sunshine Coast, BC ($30 thousand)
Meeting Infrastructure Needs through Investments

This most recent review of Canadian Transit Infrastructure Needs demonstrates an increasing volume of transit projects require additional investments, with new level of $56.6B identified. For the most recent period, 2014-2018, 33% of infrastructure needs are unfunded and require additional funding, compared to 25% in 2012-2016.

The amount requiring additional funding for infrastructure Rehabilitation & Replacement has decreased, the amount needed to fund Expansion projects has increased by $6 billion, or 55%.

This demonstrates a continued need for new additional investments to support the expansion of Canada’s transit systems, as well as the continued funding of Rehabilitation & Replacement projects.
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