

Canada's Core Public Infrastructure Survey: Roads, bridges and tunnels, 2016

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Roads

Canada's road network, as reported by this survey, was long enough in 2016 to circle the Earth's equator more than 19 times.

Table 1
Length of publicly-owned road assets, by type of road asset, Canada, 2016

	length (kilometres)
Total roads	765,917
Highways	113,135
Arterial roads	88,270
Collector roads	110,408
Local roads	440,353
Lanes and alleys	13,751
Other	
Sidewalks	125,238

Source(s): Table [34-10-0176-01](#).

Statistics Canada, in partnership with Infrastructure Canada, has launched its first-ever catalogue of the state of the nation's infrastructure to provide statistical information on the stock, condition, performance and asset management strategies of Canada's core public infrastructure assets. This includes a wide variety of assets owned and operated by provincial, territorial, regional and municipal governments. These are bridges and tunnels, roads, wastewater, storm water, potable water and solid waste assets, as well as social and affordable housing, culture, recreation and sports facilities and public transit. *The Daily* will carry a series of releases over the coming months, each addressing a sub-group of these assets. This first release presents findings on roads, bridges and tunnels.

In 2016, the country had more than 765,000 kilometres of publicly-owned roads. Road assets were classified as highways, arterial, collector and local roads, and lanes and alleys.

Local roads were the most prevalent type of road asset, accounting for nearly three-fifths (57.5%) of total road length and over three-quarters of all municipally-owned roads. Highways comprised 14.8% of all roads, while collector roads accounted for 14.4%.

Municipalities own most roads

Over two-thirds (68.3%) of roads were owned by municipalities. Municipalities also owned 62.0% of collectors and 48.2% of arterial road assets as well as virtually all lanes and alleys (99.8%). Conversely, municipalities owned a small share of highways (2.7%).

Almost half of all roads are located in Ontario and Alberta

Almost half of all roads in Canada were located in Ontario and Alberta in 2016, each of which accounted for just under one-quarter of all roads in the country.

Ontario and Alberta had the highest share of local roads located within their boundaries, with nearly one-quarter of the total in each. Alberta (23.1%) and Ontario (21.3%) also had the highest shares of collector roads in the country.

Alberta (28.4%) and Saskatchewan (23.9%) accounted for the largest share of highways.



Nearly one in four kilometres of roads constructed since 2000

Although the pace of road construction has been relatively steady since 1940, there has been some variation. In general, the average pace of construction was relatively slow from 1940 to 1969, and then accelerated from 1970 to 1999 for every type of road except local roads, where the pace slowed. Almost two-fifths (39.8%) of all publicly-owned roads were constructed from 1970 to 1999.

Following this period of general growth, the average rate of new roads constructed has accelerated for arterial and local roads since 2000, but slowed for highways, collector roads and lanes and alleys. Almost one-quarter (22.7%) of the aggregate road length has been constructed since 2000.

Arterial road construction has increased since 2000, led by Ontario and Alberta

The combined annual rate of construction for all road types was higher in 2016 (1.7%) than the average for the 2000-to-2016 period (1.3%). The construction rate for every road type other than local roads was lower in 2016 compared with the average since 2000.

Of all the arterial roads in Canada, 30.9% were constructed from 2000 to 2016, driven by construction in Ontario and Alberta. Over the same period, 24.8% of all collector roads were built. Lanes and alleys (18.5%) had the smallest construction rate over this period.

From 1970 to 1999, 50.1% of all highways were built, followed by arterial (47.5%) and collector (44.1%) roads, lanes and alleys (41.7%) and local roads (34.4%).

From 1940 to 1969, 31.7% of all local roads were built, followed by highways (29.7%), lanes and alleys (29.4%), collector roads (28.1%) and arterial roads (16.4%).

In general, a higher proportion of rural rather than urban municipal roads were built from 1940 to 1969, while the opposite was true from 1970 to 2016.

Urban municipal roads have longer expected useful lives than rural roads

The average expected useful life of all road types ranged from 28 to 30 years. In general, a given type of road in an urban municipality had a longer expected useful life than the same type of road in a rural municipality. The largest difference in years was for lanes and alleys (35 years for urban municipal and 26 years for rural municipal), followed by collector roads (30 years for urban municipal and 22 years for rural municipal).

Over half the length of every road type except lanes and alleys are in good or very good physical condition

Over half of the highways (59.3%), local roads (51.6%) and arterial roads (51.5%) in Canada were deemed to be in very good or good physical condition. Just under half of collector roads (47.7%) were deemed to be in very good or good physical condition, while 37.3% of lanes and alleys were in very good or good physical condition. Approximately one-quarter of every road type was reported to be in fair condition, while about one-fifth of each type was in either poor or very poor condition.

A higher proportion of urban municipal collector roads (13.2%) and lanes and alleys (24.0%) were in poor or very poor condition compared with rural municipal collector roads (7.5%) and lanes and alleys (8.1%).

Two-fifths of owners have a road network asset management plan, while half of those without a plan intend to implement one

In 2016, over 40% of all road owners had an asset management plan, with Ontario road owners most likely to have a plan in place (88.3%). Among owners with an asset management plan, 22.7% updated the plan every year, 30.6% updated it every two to four years and 4.1% did not update their plan.

Urban municipal owners of roads (52.1%) were more likely to have an asset management plan than rural owners (38.1%).

A majority (56.2%) of owners that did not have a road asset management plan reported intentions to implement one, with nearly 80% of those planning to do so within the next four years.

In contrast, 22.5% of owners without an asset management plan were not expecting to adopt one in the future, while the remainder did not know if they would.

Sidewalks

Canada had 125,000 kilometres of sidewalks in 2016. Nearly all sidewalks (99.9%) were owned by municipalities and over 85% were in urban municipalities.

Over one-third (35.9%) of sidewalks were in Ontario, with Alberta and Quebec accounting for about one-fifth each.

Over one-third (36.0%) of sidewalks have been built since 2000, a higher average pace of construction compared with 1970 to 1999, when nearly half of all sidewalks were constructed.

Over two-fifths of all sidewalks (43.9%) were reported to be in good or very good condition, while 8.5% of sidewalks were reported to be in poor or very poor condition.

The average expected useful life of sidewalks was 35 years. Urban sidewalks were expected to last for 39 years, while rural municipal owners anticipated that their sidewalks would last 31 years.

Bridges and tunnels

There were 47,279 publicly-owned bridges in 2016, 43.9% of which were on local roads, 24.6% on highways and expressways, and 26.0% on arterial and collector roads combined. Footbridges accounted for 5.5% of all bridges. Almost one-third (30.7%) of all bridges in Canada were in Ontario, while 21.5% were in Alberta and 17.1% were in Quebec.

Table 2

Number of publicly-owned bridge and tunnel assets, by type of bridge and tunnel asset, Canada, 2016

	number
Total bridges	47,279
Highway/expressway bridges	11,644
Arterial bridges	6,522
Collector bridges	5,776
Local bridges	20,742
Footbridges	2,594
Other	
Culverts (diameter greater than or equal to 3 metres)	30,397
Tunnels	351

Source(s): Table 34-10-0078-01.

There were 351 publicly-owned tunnels in 2016, with Nova Scotia and British Columbia each accounting for about one-quarter.

Just over two-fifths of bridges owned by municipalities

Just over 40% of bridges were municipally owned, accounting for nearly 90% of footbridges and almost 60% of local road bridges. Municipalities also owned 48.6% of collector bridges, 38.7% of arterial bridges and 5.2% of bridges on highways. Just over half of all municipal bridges were in urban municipalities.

Municipalities owned 45.6% of all tunnels. Urban municipalities owned 94.4% of all municipal tunnels.

About one-fifth of bridges and one-third of tunnels constructed since 2000

The annual pace of construction for publicly-owned bridge types taken together was considerably higher in 2016 than the average for the 2000-to-2016 period. However, the pace of tunnel construction was lower in 2016 compared with the average for all years since 2000.

About one-fifth of bridges have been built since 2000, led by highway bridges at 18.3%, followed by collector (17.8%), arterial (17.1%) and local (16.7%) bridges. Over two-fifths of all footbridges (42.0%) in Canada have been built since 2000, the highest proportion of any bridge type, while 30.5% of tunnels were constructed over this period.

From 1970 to 1999, 45.3% of highway bridges were completed—the highest proportion—followed by footbridges (43.8%), and arterial (34.9%), collector (34.0%) and local (33.4%) bridges. Just over one-third (34.8%) of tunnels were built over this period.

The average pace of construction was faster from 1940 to 1969 compared with 1970 to 1999 for every type of bridge except bridges on highways, footbridges and tunnels. Arterial bridges (39.8%) accounted for the highest share of bridge and tunnel construction from 1940 to 1969, followed by collector (39.4%), local (37.2%) and highway (35.0%) bridges, tunnels (26.2%) and footbridges (8.0%).

For municipal owners, the combined average annual rate of construction for all bridges was more than twice as high in 2016 compared with the 2000-to-2016 period as a whole. A higher rate of construction was seen for almost every bridge type, notably for bridges on local roads, while footbridge construction posted a slight decline.

For municipally-owned assets, the average annual rate of construction for all bridge types combined was higher from 2000 to 2016 compared with the 1970-to-1999 period. The average pace of construction was similar between the two periods for tunnels. While average rates of construction were comparable between the 1970-to-1999 and 1940-to-1969 periods for other bridge types, they were substantially higher for footbridges and tunnels from 1970 to 1999.

Since 2000, the proportion of bridges and tunnels completed by municipalities was higher in rural municipalities than in urban municipalities for every bridge type, notably arterial bridges and tunnels.

In contrast, a smaller proportion of local bridges and footbridges and a larger proportion of the other bridge types were constructed by rural municipalities from 1970 to 1999, while the opposite was true from 1940 to 1969. Meanwhile, there was a higher rate of construction over both these periods for municipal bridges on highways and tunnels in urban municipalities. Over two-fifths of highway bridges (41.8%) and almost half of tunnels (46.3%) owned by rural municipalities were constructed prior to 1940.

Nearly half of local road bridges and three-fifths of other bridges and tunnels are in good or very good physical condition

About three-fifths of arterial (62.9%), collector (61.0%) and highway (59.7%) bridges and footbridges (62.7%) were reported to be in good or very good physical condition, while nearly half (49.5%) of local bridges were in good or very good physical condition. A slightly higher share of municipally-owned bridges was in good or very good condition for every type of bridge. Municipal tunnels were somewhat less likely to be in good or very good condition compared with all publicly-owned tunnels.

Just over one-tenth of bridges of every type were reported to be in poor or very poor physical condition. Local (14.0%) and collector (13.5%) bridges were most likely to be in poor or very poor physical condition, while footbridges (10.1%) were the least likely to be in poor or very poor physical condition. Just under one-tenth (9.4%) of tunnels were considered to be in poor or very poor condition.

Highway, collector and arterial bridges have longest average expected useful lives

The longest average expected useful lives of bridges were for bridges on highways (68 years), arterial roads (67 years) and collector roads (66 years). Local road bridges (48 years) and footbridges (51 years) were expected to be useful for the shortest average period.

Urban municipal bridges of every type were expected to last longer than their rural counterparts, most notably for collector bridges (69 years versus 50 years) and footbridges (60 years versus 43 years).

Just over two-fifths of owners have a bridge and tunnel asset management plan, led by Ontario

In 2016, 41.9% of all public owners had a bridge and tunnel asset management plan, led by Ontario (84.9%).

A slightly higher proportion of urban municipal owners (44.2%) than rural owners (38.1%) had a bridge and tunnel asset management plan.

Culverts

There were 30,397 publicly-owned culverts greater than or equal to three metres in diameter in 2016. Ontario led the way at 41.4%, followed by Quebec (14.9%) and Alberta (12.5%).

Municipalities owned 60.6% of publicly-owned culverts, with municipal culverts almost equally split between urban and rural municipalities.

Almost one-third of culverts (31.3%) were built from 2000 to 2016, a faster pace of construction compared with 1970 to 1999 when 43.9% of culverts were constructed.

Since 2000, 42.9% of rural municipal culverts were constructed compared with 28.7% for urban culverts.

Almost two-thirds (64.9%) of publicly-owned culverts were in good or very good physical condition, while 11.5% were in poor or very poor condition.

Culverts had an average expected useful life of 46 years, ranging from 26 years in Newfoundland and Labrador to 75 years in New Brunswick.

Note to readers

Canada's Core Public Infrastructure Survey 2016 was conducted in partnership with Infrastructure Canada.

Data are based on responses from approximately 1,500 government organizations selected from Statistics Canada's Business Register, the central repository of information on public and private organizations operating in Canada. It is used as the principal frame for most of Statistics Canada's economic statistical programs. The following organizations are included in the survey:

- Provincial and territorial departments and ministries responsible for roads; bridges and tunnels; public social and affordable housing; culture, recreation and sports; and, public transit
- Regional governments within the urban core
- Urban municipalities
- Rural municipalities with at least 1,000 residents.

The survey results cover nine asset types (bridges and tunnels; culture, recreation and sports facilities; potable water; public transit; roads; public social and affordable housing; solid waste; storm water; wastewater) as well as information on asset management practices, 13 geographic regions, five municipality sizes and urban/rural municipalities.

Throughout this release, the term **publicly-owned** refers to an asset being owned or leased by the provincial, territorial, regional and municipal orders of government.

Road lengths have been reported in terms of two-lane equivalent kilometres, where one kilometre of a four-lane highway is counted as two kilometres.

Respondents were provided the following condition rating scale when asked to rate the overall physical condition of their assets:

Very poor: The asset is unfit for sustained service. Near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable.

Poor: Increasing potential of affecting service. The asset is approaching end of service life; condition below standard and a large portion of system exhibits significant deterioration.

Fair: The asset requires attention. The assets show signs of deterioration and some elements exhibit deficiencies.

Good: The asset is adequate. Acceptable, generally within mid stage of expected service life.

Very good: Asset is fit for the future. Well maintained, good condition, new or recently rehabilitated.

An **asset management plan** defines how a group of assets is to be managed over a period of time. The asset management plan describes the characteristics and condition of infrastructure assets, the levels of service expected from them, planned actions to ensure the assets are providing the expected level of service, and financing strategies to implement the planned actions.

Information on other asset types will be released over the coming months.

Available tables: [34-10-0068-01](#), [34-10-0078-01](#), [34-10-0120-01](#), [34-10-0144-01](#), [34-10-0165-01](#), [34-10-0167-01](#), [34-10-0174-01](#), [34-10-0176-01](#), [34-10-0177-01](#), [34-10-0069-01](#), [34-10-0170-01](#), [34-10-0071-01](#), [34-10-0072-01](#), [34-10-0173-01](#), [34-10-0074-01](#), [34-10-0077-01](#), [34-10-0168-01](#), [34-10-0169-01](#), [34-10-0171-01](#), [34-10-0172-01](#), [34-10-0070-01](#), [34-10-0073-01](#), [34-10-0076-01](#) and [34-10-0075-01](#).

Definitions, data sources and methods: survey number [5173](#).

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; STATCAN.infostats-infostats.STATCAN@canada.ca) or Media Relations (613-951-4636; STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca).

For more information about why the survey was conducted and how it will inform infrastructure policy and program development and investment decisions, please contact Infrastructure Canada (toll-free: 1-877-250-7154 or 613-948-1148 or by email at infc.info.infc@canada.ca) or Infrastructure Canada Media Relations (toll-free: 1-877-250-7154 or 613-960-9251 or by email at infc.media.infc@canada.ca).