The 2019 Canada Infrastructure Report Card is a collective effort produced by the following organizations: The Association of Consulting Engineering Companies Canada (ACEC), the Canadian Construction Association (CCA), the Canadian Parks and Recreation Association (CPRA), the Canadian Public Works Association (CPWA), the Canadian Society for Civil Engineering (CSCE), the Canadian Urban Transit Association (CUTA), the Canadian Network of Asset Managers (CNAM), and the Federation of Canadian Municipalities (FCM).

BluePlan Engineering was responsible for preparing the technical report. Design and layout was provided by Actual Media.

For more information on this Report Card, or the project, please contact infrastructure@fcm.ca

Monitoring the State of Canada’s Core Public Infrastructure:

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Suivi de l’état des infrastructures publiques essentielles du Canada :
Bulletin de rendement des infrastructures canadiennes de 2019
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EXECUTIVE SUMMARY

We are proud to introduce this third iteration of the Canadian Infrastructure Report Card (CIRC) to our national infrastructure conversation. The CIRC offers an objective look at the state of core public infrastructure across Canada.

Public infrastructure gets people and goods moving, provides safe drinking water, handles our waste, creates spaces for sport and recreation, and helps protect our homes against flooding and other natural disasters. It is the foundation that the daily life of Canadians is built upon. The strength of this foundation enables our communities and local businesses to grow, and ensures Canadians have a high quality of life.

This year’s report provides a timely update on the state of Canada’s public infrastructure across all core public infrastructure asset categories: roads and bridges; culture, recreation and sports facilities; potable water; wastewater; stormwater; public transit; and solid waste. It finds that the state of our infrastructure is at risk, which should be cause for concern for all Canadians. In order to change course, Canada’s public infrastructure will require significant attention in the coming decades.

The evidence for the poor state of Canada’s infrastructure comes from the voluntary and federally administered Canadian Core Public Infrastructure Survey (CCPIS). Responses to the CCPIS provide the foundational performance measurement data on the state of Canada’s public infrastructure. The questions align with those used to create the 2012 and 2016 CIRC. This facilitates a direct comparison and gives us an exceptional view of the state of our assets over time.

The CIRC partner organizations applaud the federal government, and in particular Infrastructure Canada and Statistics Canada, for initiating the CCPIS and committing to continue to deliver the survey in future years. It is a robust data set, and one that infrastructure professionals across the country can rely on as they make decisions about the assets in their communities.

We were pleased to see a strong response rate for the CCPIS. When the federal government issued the survey to public infrastructure agencies across Canada in 2017, it received responses from 90% of the approximately 2,000 invited jurisdictions that own and manage public infrastructure. This doubles the population represented in the 2016 CIRC survey, with almost 15 times as many municipalities represented.

Given the CIRC’s importance to the national infrastructure conversation, we streamlined this year’s report for ease of use. When we issued the 2016 CIRC, stakeholders were clear about which features they found most helpful. We listened to their feedback and designed this lean report, which highlights the most important elements of the state of Canada’s infrastructure. Future CIRC publications will use a similar approach.
In the interest of making the CIRC results more accessible and useful, users can now benchmark communities against similar municipalities across the country. We believe that delivering the data in this innovative way helps infrastructure stakeholders meaningfully engage with the CCPIS results.

It has always been important to the organizations involved in the CIRC to root our approach in reporting only the facts as provided by survey respondents. This separates the CIRC from other national report cards around the world in which the facts are combined with advocacy positions intended to influence infrastructure policy. This is not our intent. The analysis in this report presents only a summary of the information reported by infrastructure agencies.

CIRC 2019 provides stakeholders across the country with the evidence and analysis they need to have meaningful discussions about the state of Canada’s infrastructure.
Leveraging the CCPIS Survey Data

The Canadian Core Public Infrastructure Survey (CCPIS) was issued in 2017 to municipalities and captured year-end 2016 data. The data was collected and analyzed by Statistics Canada before being released in stages during the second half of 2018. Our CIRC group then compiled the published CCPIS data and analyzed it to produce the graphs and tables contained in this report. We will develop future CIRCs based on subsequent versions of the survey administered by Statistics Canada. There is ongoing dialogue between CIRC representatives and Infrastructure Canada and Statistics Canada to enhance the survey and the resultant data.

Quality of Data

As the CCPIS was the first iteration of what we expect to be many surveys capturing similar or related data from communities, it is important to note that survey questions, categories and measures can change periodically to improve the accuracy and data quality. The facilitation of a pan-Canadian survey of communities is a complex venture and everyone involved recognizes that adjustments to the methodology and survey need to occur as the process evolves.
Lack of Financial Data

Statistics Canada determined that it was not appropriate to release the financial data collected through the CCPIS due to data integrity issues. This includes the replacement value and the planned investment/expenditure levels for each asset portfolio.

The lack of replacement value data limits our ability to produce some of the analysis found in the 2016 CIRC. For example, the CCPIS data provides the breakdown of the percentage of water treatment facilities, water reservoirs, and water pumping stations in various conditions (i.e., very poor, poor, fair, good, very good, unknown). We would need the total replacement value of these asset portfolios in order to calculate a weighted overall condition for all non-linear potable water assets.

The lack of planned investment/expenditure data prevents us from publishing reinvestment rates. Reinvestment rates are an indicator of how the current state of the infrastructure systems is expected to change in the coming years.

We intend to report on reinvestment rates in future iterations of the CIRC.

Increased Accuracy and Precision of Responses: Data subdivided by population, province and urban/rural municipalities

As a result of the methodology used in the CCPIS, we can now report the results by the population of each municipality, urban or rural classification and by province/territory. This reporting dramatically improves the ability of infrastructure stakeholders in a community to compare themselves against an appropriate peer group from across the country.

The Addition of Publicly Owned and Municipally Owned Infrastructure

The CCPIS includes the results of all publicly owned infrastructure at a national level. Publicly owned infrastructure is a broad classification that includes the assets owned by regional governments, provincial/territorial governments and other infrastructure agencies that are not considered a municipality. The publicly owned infrastructure data is reported at a national level, as well as by province/territory.

Municipally owned infrastructure is a subset of publicly owned infrastructure, being only the infrastructure owned by infrastructure agencies officially classified as a ‘municipality’. This infrastructure is subdivided by municipality size, urban/rural classification and province.

The inclusion of publicly owned infrastructure builds on the CIRC’s momentum and makes it a more comprehensive review of all public infrastructure systems that provide services to our communities.
A Consistent Condition Rating Scale

The methodology in the CCPIS used a condition rating scale that is consistent with previous CIRC publications. This increases the comparability of the data over time, but as noted above, the 2019 CIRC is based on dramatically higher response rates, which limits the direct comparability to the 2016 or 2012 CIRC. This is the condition rating scale used in the CCPIS:

- **Very poor:** The asset is unfit for sustained service. It is near or beyond its expected service life and shows widespread signs of advanced deterioration. Some assets may be unusable.

- **Poor:** There is an increasing potential for its condition to affect the service it provides. The asset is approaching the end of its service life, the condition is below the standard and a large portion of the system exhibits significant deterioration.

- **Fair:** The asset requires attention. The asset shows signs of deterioration and some elements exhibit deficiencies.

- **Good:** The asset is adequate. It is acceptable and generally within the mid-stage of its expected service life.

- **Very Good:** The asset is fit for the future. It is well maintained, in good condition, new or recently rehabilitated.

- **Unknown:** Not enough data exists to respond.

Although the survey respondents were asked to identify the current state of their assets using this rating scale, it is important to note that the survey did not include subject matter-specific references for the condition rating of each asset category (i.e., Building Condition Index for facilities, pavement Quality Index values for roads). The survey results provided by each jurisdiction represent the perspective of whomever completed the survey against the rating scale provided above.
A significant amount of municipal infrastructure is in poor or very poor condition. Infrastructure in this condition represents an immediate need for action, as the rehabilitation or replacement of these assets is required in the next 5-10 years to ensure that the services it provides continue to meet the community’s expectations.

An even larger proportion of municipal infrastructure is in fair condition. Infrastructure in this condition represents a view of things to come in the medium to long term. This infrastructure will continue to deteriorate over the next decade, falling into poor and very poor condition if rehabilitation or replacement actions are not taken.

The report also highlights that a majority of the infrastructure that Canadian’s rely on every day is more than 20 years old. This finding emphasizes the need for continued reinvestment in existing infrastructure alongside construction of new assets.
KEY MESSAGES

Roads, Bridges and Tunnels
There are enough Canadian roads in poor condition to build a road almost halfway to the moon.

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Subcategory</th>
<th># And % in Poor/Very Poor Condition</th>
<th># And % in Fair Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads, Bridges, and Tunnels</td>
<td>Roads</td>
<td>146,255 km (16.4%)</td>
<td>201,283 km (22.6%)</td>
</tr>
<tr>
<td></td>
<td>Bridges and Tunnels</td>
<td>9,661 Structures (12.4%)</td>
<td>20,502 Structures (26.3%)</td>
</tr>
</tbody>
</table>

Culture and Recreation Facilities
One in three recreational or cultural facilities require investment in the next decade. This does not include the programmatic or functional deficiencies they may need to enhance their relevance and use.

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Subcategory</th>
<th># And % in Poor/Very Poor Condition</th>
<th># And % in Fair Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture and Recreation</td>
<td>Ice Arenas/Pools</td>
<td>564 Facilities (12.7%)</td>
<td>883 Facilities (19.8%)</td>
</tr>
<tr>
<td></td>
<td>Arts and Culture Facilities</td>
<td>380 Facilities (8.6%)</td>
<td>721 Facilities (16%)</td>
</tr>
<tr>
<td></td>
<td>Other Facilities</td>
<td>1,886 Facilities (8.6%)</td>
<td>4,972 Facilities (22.7%)</td>
</tr>
</tbody>
</table>
Potable Water, Wastewater and Stormwater

- Of our linear assets (e.g., watermains, sewers), 30% are in fair or worse condition.
- Climate change puts an additional strain on these infrastructure systems.

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Subcategory</th>
<th># And % in Poor/Very Poor Condition</th>
<th># And % in Fair Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potable Water</td>
<td>Linear Infrastructure</td>
<td>17,788 km (9.6%)</td>
<td>32,641 km (17.7%)</td>
</tr>
<tr>
<td></td>
<td>Non-linear Infrastructure</td>
<td>573 Facilities (6.4%)</td>
<td>1,333 Facilities (15%)</td>
</tr>
<tr>
<td>Wastewater</td>
<td>Linear Infrastructure</td>
<td>16,350 km (10.8%)</td>
<td>26,211 km (17.3%)</td>
</tr>
<tr>
<td></td>
<td>Non-linear Infrastructure</td>
<td>1,386 Facilities (10%)</td>
<td>2,896 Facilities (20.6%)</td>
</tr>
<tr>
<td>Stormwater</td>
<td>Linear Infrastructure</td>
<td>50,251 km (11.3%)</td>
<td>84,614 km (19%)</td>
</tr>
<tr>
<td></td>
<td>Non-linear Infrastructure</td>
<td>700 Facilities (4.4%)</td>
<td>1,866 Facilities (11.8%)</td>
</tr>
</tbody>
</table>

Public Transit

More than 30% of tracks require investment in the next decade.

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Subcategory</th>
<th># And % in Poor/Very Poor Condition</th>
<th># And % in Fair Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Transit</td>
<td>Rolling assets</td>
<td>604 Units (2.7%)</td>
<td>6,751 Units (30%)</td>
</tr>
<tr>
<td></td>
<td>Fixed assets</td>
<td>2,298 Facilities (7.8%)</td>
<td>3,207 Facilities (11%)</td>
</tr>
<tr>
<td></td>
<td>Roads/Tracks</td>
<td>1,367 km (15.8%)</td>
<td>1,343 km (15.5%)</td>
</tr>
</tbody>
</table>
KEY MESSAGES

Solid Waste

One in four transfer stations require investment in the next decade.

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Subcategory</th>
<th># And % in Poor/Very Poor Condition</th>
<th># And % in Fair Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Waste</td>
<td>Transfer Station</td>
<td>89 Facilities (7.5%)</td>
<td>193 Facilities (16%)</td>
</tr>
<tr>
<td></td>
<td>Waste Diversion</td>
<td>27 Facilities (3.7%)</td>
<td>86 Facilities (11.6%)</td>
</tr>
<tr>
<td></td>
<td>Waste Disposal</td>
<td>111 Facilities (7%)</td>
<td>326 Facilities (15.7%)</td>
</tr>
</tbody>
</table>

Figure 2: Example of asset deterioration curve (Roads)
Asset management (AM) is a strategic approach to managing infrastructure assets that helps infrastructure owners (e.g. municipalities) maintain and operate infrastructure effectively so that critical services can be provided to the public. Asset Management Plans (AMP) lay out how a group of assets is to be managed over a period of time. The AMP describes the characteristics and condition of infrastructure assets, the level 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.

Similar to previous CIRCs, the CCPIIS included questions about the state of asset management practices in each jurisdiction. One of the most revealing questions was whether the infrastructure owner has an Asset Management Plan (AMP). That plan is important because it is the functional report that they use to understand the state of their infrastructure assets and plan the lifecycle expenditures required to sustain those assets.

There is a notable variation in who has a documented AMP, depending on their population size. Only 29% of small municipalities (i.e., less than 5,000 people) reported a documented AMP. Of medium-sized municipalities (i.e., 5,000-30,000 people) 56% reported a documented AMP and 70% of large municipalities (i.e., 30,000 people or more) reported a documented AMP. Asset management is still relatively new in Canada, and asset management capacity is growing. The survey results highlight the increasing adoption of AM in larger municipalities, while also reminding us of the need to continue supporting smaller municipalities with funding and technical support to adopt AM practices.

AM capacity is in part being enhanced through the Municipal Asset Management Program (MAMP), which is funded by Infrastructure Canada and delivered by the Federation of Canadian Municipalities (FCM). The program’s mandate is to increase awareness of AM and develop technical AM expertise at the local level. MAMP programming is delivered through a number of partner organizations including the Canadian Network of Asset Managers (CNAM), the Canadian Urban Transit Association (CUTA), NAMS Canada, Centre d’expertise et de recherche en infrastructures urbaines (CERIU), and the Atlantic Infrastructure Management (AIM) Network. The 2019 federal budget increased funding for the program, extending it to March 2024.
Figure 3: Municipal Organizations with Documented Asset Management Plan (Municipalities with up to 5,000 people)

- 71% Organization has a documented asset management plan
- 29% Organization does not have a documented asset management plan

Figure 4: Municipal Organizations with Documented Asset Management Plan (Municipalities with 5,000 to 30,000 people)

- 44% Organization has a documented asset management plan
- 56% Organization does not have a documented asset management plan

Figure 5: Municipal Organizations with Documented Asset Management Plan (Municipalities with 30,000 or more people)

- 30% Organization has a documented asset management plan
- 70% Organization does not have a documented asset management plan

Figure 6: Public Organizations with Documented Asset Management Plan

- 62% Organization has a documented asset management plan
- 38% Organization does not have a documented asset management plan
COMPARISON WITH THE 2016 CIRC RESULTS

Each asset category (except solid waste, a new category) has a side-by-side comparison of the condition profile reported in the 2016 CIRC against the 2019 results. Use a degree of caution when drawing conclusions from the comparison, for two reasons:

- We used a significantly larger sample size used to generate the 2019 CIRC.
- It was challenging to calculate the overall condition profiles in each asset category given the lack of replacement value data.

Notwithstanding these considerations, a comparison of the 2016 and 2019 results suggests the following:

- The 2016 CIRC results are generally consistent with the 2019 results. Despite the small 2016 CIRC sample size, the overall condition profile of each asset category is generally consistent with the 2016 CIRC and 2019 CIRC results. We can conclude that the 2016 CIRC presented an accurate overall view of the state of Canada’s core infrastructure.

- The CIRC and the CCPIS data give us the ability to compare how the state of infrastructure changes over time. The best policy is informed by an analysis of high-quality data, and the CIRC provides unbiased facts that support these national infrastructure conversations. We noted several trends:
  
  - The 2019 results indicate that some asset categories have a worse condition profile than what was reported in 2016 (i.e., roads, bridges, wastewater, linear stormwater).
  
  - The 2019 results indicate that some asset categories have a better condition profile than what was report in 2016 (i.e., water, non-linear stormwater, culture and recreation facilities, transit).
  
  - In 2019, we included solid waste assets in the CIRC for the first time.

It is too early to draw conclusions about the impact of infrastructure policy or funding on the state of infrastructure systems. Infrastructure is a naturally slow sector as complex infrastructure can require several years to plan, design and construct. Infrastructure agencies can take months to update their infrastructure data to reflect an asset’s new condition. For these reasons, we will need additional iterations of the CCPIS and CIRC before we can provide the data points necessary to identify trends and connect them to implemented infrastructure policy.
RESULTS BY INFRASTRUCTURE CATEGORY
ROADS AND BRIDGES

The road networks section of our survey focused on two-lane equivalent kilometres of highways, arterial roads, collector roads, local roads, lanes, alleys and sidewalks. The survey also included questions about bridges and tunnels, including highway and expressway bridges, arterial bridges, collector bridges, footbridges, local bridges, culverts three metres and greater and tunnels.

Roads and Bridges: Road Asset Inventory

Roads and Bridges: Bridge and Tunnel Assets Inventory
The Current State

Almost 40% of these assets are in fair or worse condition and only 20% of the assets were constructed in the last 20 years.

We assessed these assets using a defined scale and their age profile.

- Roads Estimated Service Life (ESL) of 20-40 years.
- Sidewalks ESL of 50 years.
- Bridges and culverts ESL of 50 years.

Roads and Bridges: Publicly Owned Road Asset Inventory (Completed Construction)

Roads and Bridges: Publicly Owned Bridge and Tunnel Assets Inventory (Completed Construction)
RESULTS BY INFRASTRUCTURE CATEGORY

Roads and Bridges:
Overall Asset Condition – Roads

- Very Poor: 6%
- Poor: 10%
- Fair: 16%
- Good: 22%
- Very Good: 35%
- Unknown: 0%

Roads and Bridges:
Overall Asset Condition – Bridges and Tunnels

- Very Poor: 2%
- Poor: 3%
- Fair: 9%
- Good: 26%
- Very Good: 42%
- Unknown: 0%

Roads and Bridges: Comparison with 2016 Results

- Roads: 2016 CIRC
  - Very Poor: 11%
  - Poor: 22%
  - Fair: 35%
  - Good: 16%
  - Very Good: 10%
  - Unknown: 2%

- Bridges: 2016 CIRC
  - Very Poor: 0%
  - Poor: 3%
  - Fair: 26%
  - Good: 42%
  - Very Good: 18%
  - Unknown: 9%

- Roads: 2019 CIRC
  - Very Poor: 6%
  - Poor: 11%
  - Fair: 16%
  - Good: 22%
  - Very Good: 35%
  - Unknown: 0%

- Bridges: 2019 CIRC
  - Very Poor: 2%
  - Poor: 3%
  - Fair: 9%
  - Good: 26%
  - Very Good: 42%
  - Unknown: 0%
RESULTS BY INFRASTRUCTURE CATEGORY

Roads and Bridges: Detailed Asset Condition – Publicly Owned Road Asset Condition

Roads and Bridges: Detailed Asset Condition – Publicly Owned Bridge and Tunnel Assets Inventory
RESULTS BY INFRASTRUCTURE CATEGORY

Roads and Bridges: Other Relevant Data – Municipally Owned Road Asset Condition (All Rural Municipalities)

Roads and Bridges: Other Relevant Data – Municipally Owned Road Asset Condition (All Urban Municipalities)

Legend:
- Very Poor
- Poor
- Fair
- Good
- Very Good
- Unknown
**RESULTS BY INFRASTRUCTURE CATEGORY**

**Roads and Bridges: Other Relevant Data – Municipally Owned Bridge and Tunnel Assets (All Rural Municipalities)**

**Roads and Bridges: Other Relevant Data – Municipally Owned Bridge and Tunnel Assets (All Urban Municipalities)**

---

**Very Poor**  **Poor**  **Fair**  **Good**  **Very Good**  **Unknown**
CULTURE, RECREATION AND SPORTS FACILITIES

Our survey included several types of culture, recreation and sport facilities:

- **Ice arena facilities**: Indoor ice arenas with 1-5 pads or more, outdoor ice arenas.
- **Pool facilities**: Indoor pools of 25 metres or 50 metres or more, leisure pools, outdoor pools, wading pools, splash pads.
- **Arts and culture facilities**: Galleries, libraries, museums and archives, presentation and performance spaces.
- **Other facilities**: Indoor and outdoor skate parks, indoor curling rinks, indoor and outdoor stadiums, indoor and outdoor tennis courts, indoor and outdoor sports fields, community centres, multi-purpose facilities.

**Culture, Recreation and Sports Facilities: Asset Inventory**

![Bar chart showing asset inventory of different types of culture, recreation, and sports facilities, categorized by publicly owned and municipally owned assets.](chart_image)
RESULTS BY INFRASTRUCTURE CATEGORY

THE CURRENT STATE

These assets have a consistent condition across this category. Approximately 30-35% of them are in fair condition or worse, and a large proportion of some facility types are more than 50 years old.

The asset classes in the worst condition (i.e., more than 30% are in fair, poor or very poor condition) include single pad ice arenas, outdoor pools and wading pools, indoor 25-metre pools, indoor curling rinks and tennis courts.

We assessed these assets using a defined scale and their age profile.

This asset category is complicated given the public’s expectations around criteria unrelated to a facility’s physical condition. This includes, for example, revised amenity requirements as demographics shift, and updating facilities for better environmental/energy performance, etc. These are important considerations that are not fully captured in traditional condition assessment data.

- Sports fields and courts ESL of 25 years.
- Playgrounds and other park equipment ESL of 10-15 years depending on the equipment, and playground structures 25-50 years depending on material.
- Asphalt trails and parking lots ESL of 25 years.
- Buildings and structures ESL of 40 years (before they need some substantial refurbishment).
Culture, Recreation and Sports Facilities:
Publicly Owned Asset Inventory (Completed Construction)
RESULTS BY INFRASTRUCTURE CATEGORY

Culture, Recreation and Sports Facilities:
Overall Asset Condition – Ice Arenas and Pools

Culture, Recreation and Sports Facilities:
Overall Asset Condition – Arts and Culture Facilities

Culture, Recreation and Sports Facilities:
Overall Asset Condition – Other Facilities
Culture, Recreation and Sports Facilities: Comparison with 2016 Results

Culture, Recreation and Sports Facilities: Detailed Asset Condition – Publicly Owned Asset Condition
### Culture, Recreation and Sports Facilities:

#### Other Relevant Data – Municipally Owned Asset Condition (All Rural Municipalities)

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Condition</th>
<th>Very Poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor ice arenas, single pad</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor ice arenas, 2 or 3 pads</td>
<td>90%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor ice arenas, 4 pads</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor ice arenas</td>
<td>70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor pools, 25 metres</td>
<td>60%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor pools, 50 metres or longer</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor pools, leisure pools</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor pools</td>
<td>30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swimming pools</td>
<td>20%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Splash pools</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wading pools</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor skate parks</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor skate parks</td>
<td>90%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor curling rinks</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor stadiums</td>
<td>70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor stadiums</td>
<td>60%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor tennis courts</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor tennis courts</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor sports fields</td>
<td>30%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Outdoor sports fields</td>
<td>20%</td>
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<tr>
<td>Community centres (Senior and youth centres)</td>
<td>10%</td>
<td></td>
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</tr>
<tr>
<td>Presentation and performance spaces</td>
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<tr>
<td>Museums and archives</td>
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<tr>
<td>Libraries</td>
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<td>galleries</td>
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<tr>
<td>galleries</td>
<td>30%</td>
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<td>galleries</td>
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<td>galleries</td>
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<td>galleries</td>
<td>0%</td>
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</tbody>
</table>

**Legend:**
- Very Poor
- Poor
- Fair
- Good
- Very Good
- Unknown
RESULTS BY INFRASTRUCTURE CATEGORY

Culture, Recreation and Sports Facilities:
Other Relevant Data – Municipally Owned Asset Condition (All Urban Municipalities)
The potable water infrastructure assets in our survey included the linear portion of drinking water systems (i.e., local water and transmission pipes) and non-linear assets (i.e., water treatment facilities, water pumping stations, water reservoirs). Linear water infrastructure is classified into local water pipes—known as distribution pipes—and transmission pipes.

### Potable Water: Linear Asset Inventory

<table>
<thead>
<tr>
<th>Kilometres</th>
<th>Local water pipes (diameter &lt; 416 mm)</th>
<th>Transmission pipes (diameter &gt;= 416 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>180,000</td>
<td>160,000</td>
<td>140,000</td>
</tr>
<tr>
<td>120,000</td>
<td>100,000</td>
<td>80,000</td>
</tr>
<tr>
<td>60,000</td>
<td>40,000</td>
<td>20,000</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Kilometres**

**Publicly owned assets**  **Municipally owned assets**

### Potable Water: Non-linear Asset Inventory

<table>
<thead>
<tr>
<th>Units</th>
<th>Water treatment facilities</th>
<th>Storage tanks after intake not part of a treatment plant</th>
<th>Water pump stations</th>
<th>Water reservoirs (including dams) before intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,500</td>
<td>3,000</td>
<td>2,500</td>
<td>2,000</td>
<td>1,500</td>
</tr>
<tr>
<td>2,000</td>
<td>1,500</td>
<td>1,000</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Units**

**Publicly owned assets**  **Municipally owned assets**
The Current State

Overall, approximately 30% of potable water infrastructure is in very good condition, 40% is in good condition and 25% is in fair, poor or very poor condition. Approximately 30-40% of these assets were constructed in the last 20 years.

We assessed these assets using a defined scale and their age profile.

- Watermains have an ESL of 70-100 years depending on the material.
- Vertical facilities have an ESL of 50-80 years for structural components, 25 years for mechanical and electrical components.

Potable Water: Publicly Owned Asset Inventory (Completed Construction)
RESULTS BY INFRASTRUCTURE CATEGORY

**Potable Water:**
**Overall Asset Condition – Linear**
- Very Poor: 3%
- Poor: 6%
- Fair: 18%
- Good: 36%
- Very Good: 31%

**Potable Water:**
**Overall Asset Condition – Non-linear**
- Very Poor: 2%
- Poor: 5%
- Fair: 15%
- Good: 41%
- Very Good: 33%

**Potable Water: Comparison with 2016 Results**

<table>
<thead>
<tr>
<th></th>
<th>2016 CIRC</th>
<th>Linear</th>
<th>Non-linear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Poor</td>
<td>31%</td>
<td>18%</td>
<td>9%</td>
</tr>
<tr>
<td>Poor</td>
<td>2%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Fair</td>
<td>6%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Good</td>
<td>18%</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>Very Good</td>
<td>33%</td>
<td>36%</td>
<td>41%</td>
</tr>
<tr>
<td>Unknown</td>
<td>31%</td>
<td>36%</td>
<td>18%</td>
</tr>
</tbody>
</table>
RESULTS BY INFRASTRUCTURE CATEGORY

**Potable Water: Detailed Asset Condition – Publicly Owned Assets**

- Water treatment facilities
- Storage tanks after intake not part of a treatment plant
- Water pump stations
- Water reservoirs (including dams) before intake
- Local water pipes (diameter < 416 mm)
- Transmission pipes (diameter >= 416 mm)

Legend:
- Very Poor
- Poor
- Fair
- Good
- Very Good
- Unknown
RESULTS BY INFRASTRUCTURE CATEGORY

Potable Water: Other Relevant Data – Municipally Owned Assets
(All Rural Municipalities)

Potable Water: Other Relevant Data – Municipally Owned Assets
(All Urban Municipalities)
RESULTS BY INFRASTRUCTURE CATEGORY

WASTEWATER

The wastewater infrastructure assets in our survey included linear wastewater collection systems (i.e., sewer pipes and sanitary force mains) and non-linear assets (i.e., treatment plants, lagoon systems, pumping stations, lift stations and storage tanks).

Wastewater: Linear Asset Inventory

Wastewater: Non-linear Asset Inventory
THE CURRENT STATE

Approximately 25% of wastewater infrastructure is in very good condition and 30-40% is in good condition. These positive results represent approximately 55-65% of wastewater assets.

That said, approximately 15% of linear wastewater assets have an unknown condition, which highlights the challenges in assessing underground assets. A large portion of linear wastewater assets are more than 50 years old.

We assessed these assets using a defined scale and their age profile.

- Sewers have an ESL of 70-100 years depending on the material.
- Vertical facilities have an ESL of 50-80 years for structural components, 25 years for mechanical and electrical components.

**Wastewater: Publicly Owned Asset Inventory (Completed Construction)**
RESULTS BY INFRASTRUCTURE CATEGORY

**Wastewater:**
- **Overall Asset Condition – Linear**
  - 31% Very Poor
  - 26% Poor
  - 17% Fair
  - 8% Good
  - 3% Very Good
  - 15% Unknown

- **Overall Asset Condition – Non-linear**
  - 40% Very Poor
  - 21% Poor
  - 7% Fair
  - 5% Good
  - 3% Very Good
  - 25% Unknown

**Wastewater: Comparison with 2016 Results**

<table>
<thead>
<tr>
<th>2016 CIRC</th>
<th>Linear</th>
<th>Non-linear</th>
<th>2019 CIRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Poor</td>
<td>Poor</td>
<td>Unknown</td>
<td>Very Poor</td>
</tr>
</tbody>
</table>
RESULTS BY INFRASTRUCTURE CATEGORY

Wastewater: Detailed Asset Condition – Publicly Owned Asset Condition

- Wastewater treatment plants (includes sludge handling plants)
- Lagoon systems
- Wastewater pump stations
- Wastewater lift stations
- Wastewater storage tanks
- Sewer pipes (diameter < 450 mm)
- Sewer pipes (diameter > 450 mm to < 1,500 mm)
- Sewer pipes (diameter >= 1,500 mm)
- Sanitary forcemains

Legend:
- Very Poor
- Poor
- Fair
- Good
- Very Good
- Unknown
STORMWATER

The stormwater infrastructure assets in our survey included linear stormwater collection systems (i.e., storm water collection pipes, open ditches and culverts less than three meters in diameter) and non-linear assets (i.e., stormwater drainage pump stations; stormwater management facilities, including stormwater management ponds, storm water wetlands and all other permitted end-of-pipe-facilities).

### Stormwater: Linear Asset Inventory

- **Culverts (diameter < 3 metres)**
- **Open ditches**
- **Stormwater pipes (diameter < 450 mm)**
- **Stormwater pipes (diameter >= 450 mm to < 1,500 mm)**
- **Stormwater pipes (diameter >= 1,500 mm)**

### Stormwater: Non-linear Asset Inventory

- **Stormwater drainage pump stations**
- **Stormwater management facilities, stormwater management ponds and stormwater wetlands**
- **Stormwater management facilities all other permitted, end-of-pipe facilities**

**Graphs showing asset inventory for publicly owned and municipally owned assets.**
THE CURRENT STATE

Approximately 40-60% of stormwater infrastructure is in good or very good condition. We don’t know the condition of a large portion of stormwater assets because historically, collecting data about their condition was a low-priority activity.

Stormwater management assets were largely built in the last 20 years, and there is a growing focus on understanding their future rehabilitation/replacement needs.

The state of stormwater infrastructure is particularly critical given the impact of climate change. Jurisdictions across Canada are experiencing longer and more intense precipitation events. This has highlighted capacity issues in stormwater infrastructure that go above and beyond the need to rehabilitate existing assets.

We assessed these assets using a defined scale and their age profile.

- Sewers and culverts have an ESL of 70-100 years depending on the material.
- Vertical facilities have an ESL of 50-80 years for structural components, 25 years for mechanical and electrical components.
- ESL of new types of stormwater management facilities is still TBD by the industry.

![Stormwater: Publicly Owned Asset Inventory (Completed Construction)](chart)

- Completed construction prior to 1940
- Completed construction 1940 to 1969
- Completed construction 1970 to 1999
- Completed construction 2000 to 2009
- Completed construction 2010 to 2015
- Completed construction 2016
RESULTS BY INFRASTRUCTURE CATEGORY

**Stormwater: Overall Asset Condition – Linear**

- Very Poor: 2%
- Poor: 9%
- Fair: 19%
- Good: 32%
- Very Good: 24%
- Unknown: 13%

**Stormwater: Overall Asset Condition – Non-linear**

- Very Poor: 1%
- Poor: 12%
- Fair: 20%
- Good: 29%
- Very Good: 34%
- Unknown: 3%

**Stormwater: Comparison with 2016 Results**

- 2016 CIRC
- 2019 CIRC

Legend:
- Very Poor
- Poor
- Fair
- Good
- Very Good
- Unknown
Stormwater: Detailed Asset Condition – Publicly Owned Asset Condition

![Bar chart showing asset condition percentages for various stormwater aspects]

- **Stormwater drainage pump stations**
- **Stormwater management facilities, stormwater management ponds and stormwater wetlands**
- **Stormwater management facilities all other permitted, end-of-pipe facilities**
- **Culverts (diameter < 3 metres)**
- **Open ditches**
- **Stormwater pipes (diameter < 450 mm)**
- **Stormwater pipes (diameter >= 1,500 mm)**
- **Stormwater pipes (diameter >= 450 mm to < 1,500 mm)**

Legend:
- Very Poor
- Poor
- Fair
- Good
- Very Good
- Unknown
RESULTS BY INFRASTRUCTURE CATEGORY

### Stormwater: Other Relevant Data – Municipally Owned Asset Condition (All Rural Municipalities)

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Very Poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stormwater drainage pump stations</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater management facilities, stormwater management ponds and stormwater wetlands</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater management facilities all other permitted, end-of-pipe facilities</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Culverts (diameter &lt; 3 metres)</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Open ditches</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
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<tr>
<td>Stormwater pipes (diameter &lt; 450 mm)</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater pipes (diameter &gt;= 1,500 mm)</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater pipes (diameter &gt; 450 mm to &lt; 1,500 mm)</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
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</table>

### Stormwater: Other Relevant Data – Municipally Owned Asset Condition (All Urban Municipalities)

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Very Poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Stormwater drainage pump stations</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater management facilities, stormwater management ponds and stormwater wetlands</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater management facilities all other permitted, end-of-pipe facilities</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
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<tr>
<td>Culverts (diameter &lt; 3 metres)</td>
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<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
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<tr>
<td>Open ditches</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater pipes (diameter &lt; 450 mm)</td>
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<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater pipes (diameter &gt;= 1,500 mm)</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Stormwater pipes (diameter &gt; 450 mm to &lt; 1,500 mm)</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
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</tbody>
</table>
PUBLIC TRANSIT

Our survey included rolling stock assets (i.e., buses, streetcars, ferries, heavy railcars, commuter railcars, light railcars, specialized transit) and fixed public transit assets (i.e., passenger stations/terminals, transit shelters, exclusive rights-of-way, parking lots, bicycle racks and shelters, passenger drop-off facilities, maintenance and storage faculties, transit exclusive bridges, tunnels, tracks, roads).

Public Transit: Asset Inventory
RESULTS BY INFRASTRUCTURE CATEGORY

THE CURRENT STATE

The condition of public transit assets varies across this category. Some relatively new types of infrastructure are in good condition and other assets, such as fixed tracks, are in much worse condition.

We assessed these assets using a defined scale and their age profile.

- Public Transit Rolling Stock assets may have a wide range of ESL. For instance buses and other motor vehicles have 7-15 years of ESL, whereas vehicles such as ferries, streetcars, and railcars have 30-40 years of ESL.

- Public Transit Fixed Assets may range from 30-75 years of ESL depending on the type of structure and the material they are made of. For instance, a passenger terminal may have 75-100 years of ESL whereas a bus shed may have 30 years of ESL.

**Public Transit: Public Owned Rolling Stock Assets (by Purchase Period)**
RESULTS BY INFRASTRUCTURE CATEGORY

Public Transit: Public Owned Fixed Assets (by Construction/Purchase Period)

- Completed construction prior to 1940
- Completed construction 1940 to 1969
- Completed construction 1970 to 1999
- Completed construction 2000 to 2009
- Completed construction 2010 to 2015
- Completed construction 2016
RESULTS BY INFRASTRUCTURE CATEGORY

Public Transit: Comparison with 2016 Results

Public Transit: Detailed Asset Condition – Publicly Owned Asset Condition
RESULTS BY INFRASTRUCTURE CATEGORY

Public Transit: Other Relevant Data – Municipally Owned Asset Condition (All Rural Municipalities)

<table>
<thead>
<tr>
<th>Public Transit</th>
<th>Other Relevant Data – Municipally Owned Asset Condition (All Rural Municipalities)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel buses</td>
<td>100%</td>
</tr>
<tr>
<td>Bio-diesel buses</td>
<td>90%</td>
</tr>
<tr>
<td>Electric buses</td>
<td>80%</td>
</tr>
<tr>
<td>Natural gas buses</td>
<td>70%</td>
</tr>
<tr>
<td>Other buses</td>
<td>60%</td>
</tr>
<tr>
<td>Streetcars</td>
<td>50%</td>
</tr>
<tr>
<td>Ferries</td>
<td>40%</td>
</tr>
<tr>
<td>Heavy railcars (includes passenger)</td>
<td>30%</td>
</tr>
<tr>
<td>Commuter railcars (includes passenger)</td>
<td>20%</td>
</tr>
<tr>
<td>Light railcars</td>
<td>10%</td>
</tr>
<tr>
<td>Hybrid buses (includes diesel, biodiesel and natural gas)</td>
<td>0%</td>
</tr>
<tr>
<td>Transi shelters</td>
<td>100%</td>
</tr>
<tr>
<td>Exclusive rights-of-way</td>
<td>90%</td>
</tr>
<tr>
<td>Parking lots (park and ride)</td>
<td>80%</td>
</tr>
<tr>
<td>Bicycle racks and shelters</td>
<td>70%</td>
</tr>
<tr>
<td>Passenger drop-off facilities “Kiss and Ride”</td>
<td>60%</td>
</tr>
<tr>
<td>Maintenance and storage facilities</td>
<td>50%</td>
</tr>
<tr>
<td>Bridges (non-transit exclusive only)</td>
<td>40%</td>
</tr>
<tr>
<td>Tunnels (transit exclusive only)</td>
<td>30%</td>
</tr>
<tr>
<td>Trails</td>
<td>20%</td>
</tr>
<tr>
<td>Roads</td>
<td>10%</td>
</tr>
</tbody>
</table>
RESULTS BY INFRASTRUCTURE CATEGORY

Public Transit: Other Relevant Data – Municipally Owned Asset Condition (All Urban Municipalities)

- Diesel buses
- Bio-diesel buses
- Electric buses
- Natural gas buses
- Hybrid buses (includes diesel, biodiesel and natural gas)
- Other buses
- Streetcars
- Ferries
- Heavy railcars (freight and passenger)
- Light railcars
- Commuter railcars (freight and passenger)
- Specialized transit (bus or rail transit and rail facilities)

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

Very Poor
Poor
Fair
Good
Very Good
Unknown

canadainfrastructure.ca
**SOLID WASTE**

The solid waste assets in our survey included transfer stations assets, waste diversion assets (i.e., composting facilities, materials recovery facilities, anaerobic digestion facilities) and waste disposal assets (i.e., engineered landfills, dump sites, closed sites, incinerators, energy from waste facilities).

**Solid Waste: Asset Inventory**

![Graph showing solid waste asset inventory](graph.png)

- **Units**
  - Anaerobic digestion facilities
  - Closed sites (inactive engineered landfills and dumps)
  - Composting facilities
  - Dump sites (active)
  - Energy from waste facilities
  - Engineered landfills (active)
  - Incinerators
  - Materials recovery facilities
  - Transfer station assets

**Publicly owned assets**

**Municipally owned assets**
THE CURRENT STATE

The solid waste assets in our survey included transfer stations assets, waste diversion assets (i.e., composting facilities, materials recovery facilities, anaerobic digestion facilities) and waste disposal assets (i.e., engineered landfills, dump sites, closed sites, incinerators, energy from waste facilities).

Solid Waste: Publicly Owned Asset Inventory (Completed Construction)
RESULTS BY INFRASTRUCTURE CATEGORY

**Solid Waste: Overall Asset Condition**

- 41% Good
- 27% Very Good
- 15% Unknown
- 11% Fair
- 3% Poor
- 2% Very Poor

**Solid Waste: Detailed Asset Condition**

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Very Poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaerobic digestion facilities</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Closed sites (inactive engineered landfills and dumps)</td>
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<td></td>
</tr>
<tr>
<td>Composting facilities</td>
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<tr>
<td>Dump sites (active)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Energy from waste facilities</td>
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<td>Engineered landfills (active)</td>
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<td>Incinerators</td>
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<td>Materials recovery facilities</td>
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<td>Transfer station assets</td>
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RESULTS BY INFRASTRUCTURE CATEGORY

Solid Waste: Other Relevant Data – Municipally Owned Asset Condition
(All Rural Municipalities)

Solid Waste: Other Relevant Data – Municipally Owned Asset Condition
(All Urban Municipalities)
THANK YOU TO ALL WHO PARTICIPATED

On behalf of the Canadian Infrastructure Report Card (CIRC) team, we would like to thank all municipalities who completed this important survey. Your knowledge and expertise will help inform investment needs and asset management practices across Canada.

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