Integrated Travels

Research Report

CANADA ROAD INFRASTRUCTURE REPORT

Created by: Priyanka Prabhu

September 2024

Summary

The report provides a detailed report of the 2019 Canadian Infrastructure Report Card highlights significant concerns about the state of Canada's core public infrastructure, including roads, bridges, potable water systems, wastewater, stormwater, public transit, and recreational facilities. Many of these assets are aging, with a large portion in fair to poor condition, indicating a pressing need for reinvestment. Roads and bridges, in particular, show advanced deterioration, and nearly 30% of potable water and wastewater infrastructure require attention. The report underscores the importance of proactive, long-term planning and investment to maintain service levels, especially as climate change exacerbates existing challenges. It also calls for improved asset management practices, particularly for smaller municipalities, to ensure that infrastructure remains reliable and resilient for future generations.

Methodology

The methodology of the 2019 Canadian Infrastructure Report Card (CIRC) is based on data collected through the Canadian Core Public Infrastructure Survey (CCPIS), issued to municipalities in 2017, capturing data as of the end of 2016. Statistics Canada collected and analyzed this data, which was released in stages during 2018. The CIRC team compiled and analyzed this data to produce the graphs and tables in the report. Future reports will be based on subsequent versions of the CCPIS, with ongoing dialogue between CIRC representatives and Statistics Canada to enhance the survey.

Key aspects of the methodology include:

- Consistency in Condition Rating: A consistent condition rating scale was used across asset categories, similar to previous CIRC publications, allowing for data comparability over time. The rating scale ranged from "Very Poor" to "Very Good."

- Data Integrity: The CCPIS was the first iteration of the survey, leading to periodic changes in survey questions and measures to improve accuracy and data quality. Some financial data, like replacement values and planned investment levels, were excluded due to integrity issues, limiting certain analyses.
- Increased Precision: The survey's methodology allowed for the subdivision of data by population size, urban/rural classification, and province/territory, enhancing the ability to compare infrastructure conditions across different community types.
- Public and Municipal Infrastructure: The report includes data on both publicly owned and municipally owned infrastructure, providing a comprehensive review of the public infrastructure systems across Canada.

The methodology acknowledges the challenges in assessing infrastructure conditions, particularly underground assets, and highlights the need for adjustments and improvements in future iterations of the survey.

Methodology in Alberta

While the Canadian Infrastructure Report Card provides a national overview, Alberta has implemented additional methodologies for infrastructure assessment:

Municipal Sustainability Initiative (MSI):

- Requires municipalities to maintain multi-year capital plans
- Encourages asset management practices

Building Canada-Alberta Program:

- Uses a project-specific assessment methodology
- Evaluates proposed infrastructure projects based on merit criteria

Alberta Transportation:

- Employs specialized methodologies for road and bridge assessments
- Uses Pavement Quality Index (PQI) for highways
- Implements Bridge Condition Index (BCI) for bridge structures

Asset Management:

- Many Alberta municipalities have adopted asset management systems
- Often includes more detailed condition assessments and risk-based prioritization

Climate Resilience:

- Recent focus on incorporating climate change considerations into infrastructure assessments
- Aligns with Alberta's Climate Leadership Plan

Key Messages

Condition of Municipal Infrastructure:

- A significant portion of municipal infrastructure is in poor or very poor condition, indicating an urgent need for rehabilitation or replacement within the next 5 to 10 years to maintain service quality.

Fair Condition Assets:

- An even larger proportion of infrastructure is classified as being in fair condition, suggesting that without timely intervention, these assets are likely to deteriorate into poor or very poor condition over the next decade.

Aging Infrastructure:

- The majority of the infrastructure that Canadians rely on daily is over 20 years old, highlighting the critical need for continued reinvestment in existing assets alongside the development of new infrastructure.

Roads and Bridges:

- There are enough Canadian roads in poor condition to build a road almost halfway to the moon, emphasizing the scale of the issue.

Culture and Recreation Facilities:

- One in three recreational or cultural facilities will require investment in the next decade, not accounting for functional deficiencies that may need enhancement.

Water Infrastructure:

- Approximately 30% of linear assets (e.g., watermains, sewers) are in fair or worse condition, with climate change further straining these systems.

Public Transit:

- More than 30% of public transit tracks require investment within the next decade, indicating a pressing need for upgrades to maintain service levels.

Investment Needs:

- The report underscores the necessity for significant attention and investment in public infrastructure to ensure that it meets community expectations and supports quality of life for Canadians.

ASSET MANAGEMENT

National Overview:

- The report emphasizes the importance of asset management practices for maintaining road and bridge infrastructure.
- It highlights that many municipalities are adopting formal asset management strategies to better manage their infrastructure.

Condition Assessment:

- Roads: Typically assessed using Pavement Condition Index (PCI) or similar metrics.
- Bridges: Often evaluated using Bridge Condition Index (BCI) or equivalent measures.

Alberta-Specific Practices:

Municipal Asset Management:

- Alberta Transportation encourages municipalities to develop and maintain Transportation Asset Management Plans (TAMPs).
- These plans help prioritize maintenance, rehabilitation, and replacement activities.

Bridge Inventory and Inspection System (BIIS):

- Alberta uses BIIS to manage its bridge infrastructure.
- Regular inspections are conducted, with frequency based on bridge type and condition.

Highway Asset Management:

- Alberta Transportation employs a comprehensive asset management system for highways.
- Uses Pavement Quality Index (PQI) to assess road conditions.

- Implements a 3-year rolling construction program based on asset condition and traffic volumes.

Municipal Sustainability Initiative (MSI):

- Provides funding to municipalities for infrastructure projects.
- Requires municipalities to maintain multi-year capital plans, encouraging long-term asset management practices.

Climate Resilience:

- Alberta is incorporating climate change considerations into infrastructure planning and asset management.
- This aligns with the province's Climate Leadership Plan.

Challenges and Opportunities:

- Aging infrastructure: Many roads and bridges in Alberta are approaching or exceeding their design life.
- Funding constraints: Balancing maintenance needs with available resources.
- Technology adoption: Increasing use of data analytics and predictive maintenance tools.

Best Practices:

- Life-cycle cost analysis for major infrastructure decisions.
- Regular condition assessments and inspections.
- Risk-based prioritization of maintenance and rehabilitation activities.
- Integration of asset management with long-term financial planning.

Results

Road Network:

- Alberta has approximately 31,000 km of provincial highways
- About 27,000 km of these are paved roads

Bridge Infrastructure:

- Alberta maintains over 4,500 bridge structures on provincial highways
- This includes about 1,800 standard bridges and 2,700 culverts

Condition Assessments:

- Alberta Transportation uses a Bridge Condition Index (BCI) to assess bridges
- For roads, Alberta uses a Pavement Quality Index (PQI)

Recent Investments:

- In 2019, Alberta announced a $1.6 billion investment in highway and bridge projects over four years

Municipal Roads:

- Alberta's cities, towns, and counties manage approximately 175,000 km of roads

Climate Considerations:

- Alberta's extreme temperature fluctuations pose unique challenges for road and bridge maintenance

Asset Management:

- Many Alberta municipalities have adopted formal asset management practices for roads and bridges
- The Alberta Urban Municipalities Association (AUMA) provides resources and guidance on asset management