RMA
RURAL MUNICIPALITIES of ALBERTA

ASSET DEFICIT SUMMARY REPORT

AUGUST 2024

BRIDGES

RMA
RURAL MUNICIPALITIES
of ALBERTA

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Introduction

Overview

Rural municipalities in Alberta can be characterized by large geographic areas and low populations, where industrial activities play a significant role in shaping the local economy. Rural municipalities manage a significant amount of Alberta's public infrastructure, providing maintenance and repairs as needed to support communities and provide industries such as forestry, energy, and agriculture with access to natural resources and markets. These sectors contribute to a significant amount of wear and tear on municipal infrastructure and as a result, the maintenance and repair of core infrastructure pose substantial challenges to municipalities.

The Rural Municipalities of Alberta (RMA) has identified a pressing need for up-to-date data to accurately quantify the infrastructure deficit across various asset types. Most critically, this assessment is required for "core" infrastructure such as bridges and culverts, roads, water and wastewater distribution and treatment utility infrastructure, and engineered stormwater infrastructure.

Past work from the RMA has indicated the existence of infrastructure deficits for these core assets. An infrastructure deficit refers to a state of deterioration of these assets below their "optimal" condition levels, which can vary depending on the asset type. As infrastructure naturally deteriorates over its expected lifecycle, only significant maintenance and re-investment can keep the asset at its optimal levels. The growing financial pressures on Alberta's rural municipalities means this deficit has likely grown over time. Limited and inconsistent data on the condition and characteristics of specific assets has made quantifying infrastructure deficits on a provincewide level extremely difficult.

This lack of data poses a significant risk to municipalities as infrastructure owners and to the industries that rely on this infrastructure. Without current and detailed data on the extent of this deficit, it is challenging to make informed decisions about the necessary investments to maintain and improve infrastructure.

The RMA developed this project to conduct a comprehensive analysis of various asset types to determine the infrastructure deficit faced by rural municipalities for each. The project relies on information provided by RMA members and provincially available data. The study's significance lies in its ability to offer evidence-based insights to measure the actual level of infrastructure investment required.

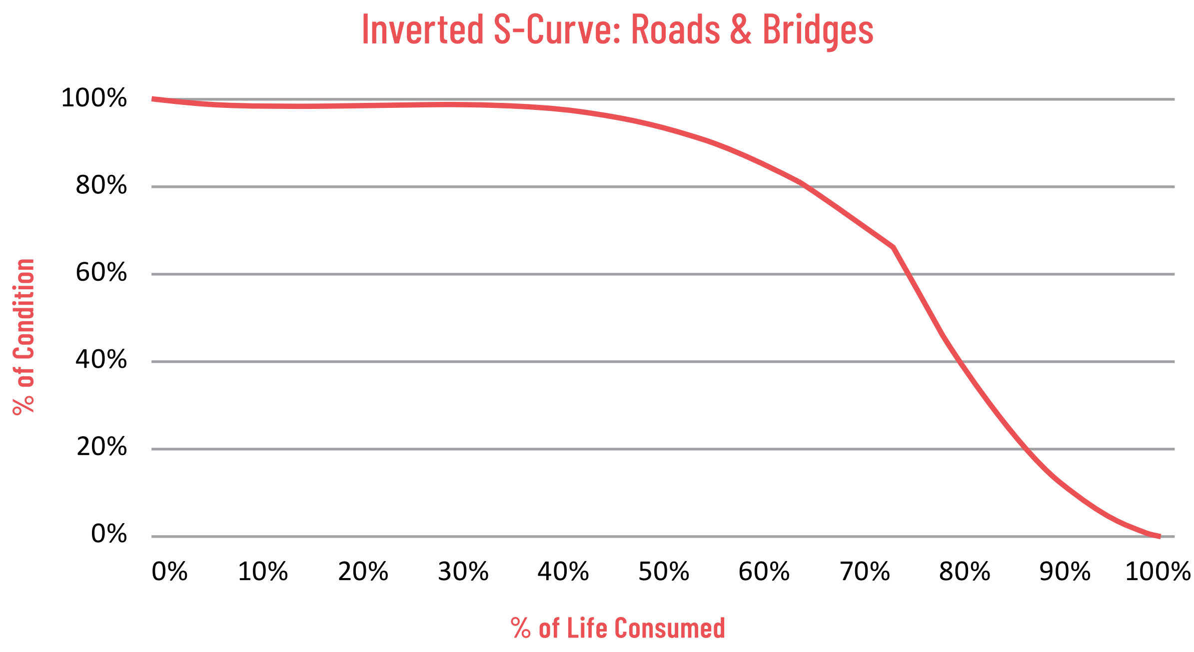
The project will produce separate reports for each asset type, with a final report summarizing and analyzing the overall rural municipal infrastructure deficit. The goal is to provide a robust data set and analyses of said data for future advocacy efforts, offering insights into the rural municipal infrastructure deficit and support overall asset management efforts for RMA members.

This report provides an overview of the analysis specifically for **bridges and culverts** managed by RMA members with an overview of the analysis process, key data sources, infrastructure deficit calculations, and identifies key findings for consideration by RMA members as well. As we explore additional asset types, the other reports will follow a similar format and include details specific to each asset.

Deterioration Curve Summary

This project is structured around a standardized deterioration curve model. The ability to derive the infrastructure deficit for RMA members relies on the ability to place the current state of member infrastructure portfolios within this model. The deterioration curve model has been used to inform analysis in several RMA reports, including 2013's *Apples to Apples: Rural Municipal Finance in Alberta*.[1] It was also used as key methodology informing RMA's input into the design of the Municipal Sustainability Initiative in 2007.

The deterioration curve model is based on the fundamental principle that **infrastructure does not deteriorate in a linear fashion**, and that strategically timing infrastructure investment can lead to greater value for money and reduced risk of rapid infrastructure deterioration or even failure. If infrastructure is not properly protected, there will be little initial change in its condition, but over time, deferred investment leads to dramatically increased loss of condition and value.



[1] Apples to Apples: Rural Municipal Finance in Alberta

Deterioration Curve Key Definitions

This assessment uses several definitions for key terms related to the Deterioration Curves and other portions of the analysis:

Useful Life: Largely based on statistics from Infrastructure Canada. "Average expected useful life of new publicly owned bridge and tunnel assets, Infrastructure Canada." This shows the average expected life of an asset without significant maintenance or reinvestment.

Effective Age: The effective age of the portfolio based on life consumed.

Life Consumed: How much of the useful life the portfolio has consumed.

Condition: The condition of the portfolio. In this study we utilize a percent condition rating.

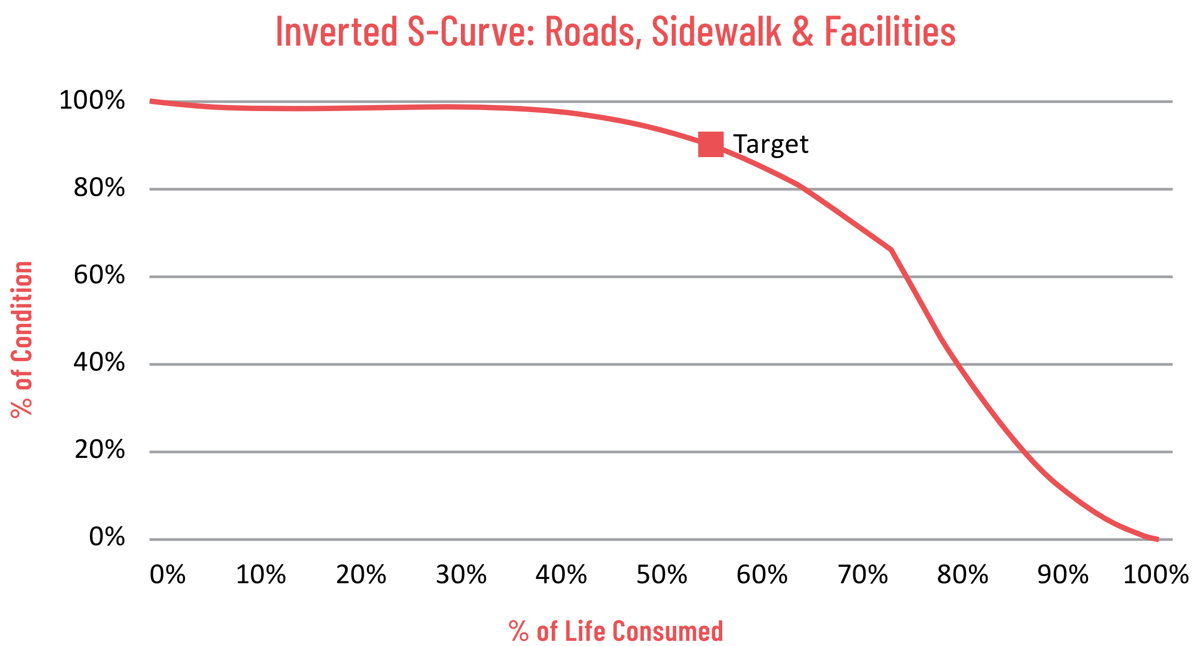
Value: The value of the portfolio based on estimated replacement cost and condition.

Holding Cost: How much it costs to keep the portfolio at the same level from year 0 to year 1.

Target: The optimal point on the deterioration curve to maintain the portfolio.

Cost to get to target: How much it would cost to bring the portfolio from its existing condition to the target condition.

Deterioration Curve Interpretation



The graph above shows the deterioration curve. The curve is a function of two factors: **the percentage of life consumed of the assets**, and **the percentage condition rating of the assets**. The horizontal axis represents the average age of the infrastructure as a percentage of its lifespan (e.g., infrastructure at the end of its life would be rated 100%). The vertical axis represents the average condition of the infrastructure as a percentage of its value. For example, a new asset, worth 100% of its value, would be rated at the 100% condition. Alternatively, a completely failed asset would be rated at a 0% condition.

For this asset study, this curve is used to model the deterioration of overall asset portfolios (all the assets of a particular type managed by rural municipalities), rather than individual assets. That means that investment can be made into individual assets, which will affect the effective condition of the portfolio. If one bridge is completely rehabilitated, it will naturally "pull" the portfolio back up the curve. If investment lags, the natural change in condition over asset age will occur, with an expectation that aging without intervention will follow the curve shape.

Benefits of the Curve

The deterioration curve used in this report provides a more accurate analysis of the infrastructure deficit than the standard straight-line deterioration method typically employed in Tangible Capital Asset (TCA) accounting. One of the primary advantages of this curve is its ability to account for varying rates of degradation over an asset's lifespan, unlike the straight-line approach which assumes a consistent level of annual degradation. This assumption in the straight-line method means

there is no optimal point identified for maintaining assets. The straight-line approach also tends to underestimate an asset's condition early in its lifespan and overestimate it later when critical investments are needed. In contrast, the deterioration curve used in this analysis incorporates a more realistic view of how assets degrade over time. By considering factors such as the optimal condition to maintain assets and the varying rates of degradation, this curve offers a more precise assessment of the infrastructure deficit.

The Optimal "Target" Point

The curve begins to slope downward at an accelerated rate at approximately 50% of the infrastructure life span, with a corresponding condition rating of 94%. At this point, the investment required simply to hold the asset portfolio at its current condition begins to accelerate. Therefore, **the most economical option is to attempt to hold the portfolio right at this drop-off point**. This point is represented by the "Target State" label and represents the most cost-effective point to maintain an asset portfolio on this curve.

Calculating an Infrastructure Deficit

This curve also shows the potential impact to municipalities if the infrastructure is left to deteriorate. Municipalities risk of having their infrastructure reach the steepest part of the curve, where repairing it becomes extremely expensive. This would put incredible pressure on municipalities to reallocate revenue from other areas to address their infrastructure issues. **Maintaining infrastructure at a higher condition level and lower percentage of lifespan is the most cost-effective way of preserving that infrastructure over time.**

Given the assessment of the curve above, it is also not efficient to fully re-invest into assets to try to make the portfolio brand new (100% condition assessment). Therefore, **the infrastructure deficit is the difference between the current condition of assets observed and the target state level of condition**, which is approximately 94% of new condition. The deficit calculation, therefore, is based on the one-time investment required to move the portfolio to its target state, and can be represented by:

Infrastructure Deficit = Portfolio Target State Value ($) – Portfolio Observed Condition Value ($)

Additional details on the technical nature of the deterioration curve can be found in Appendix A.


NOTICE

Bridge Infrastructure Background

RMA members are responsible for approximately 75% of the province's bridges. When we consider engineered culverts and other adjustments to the included assets, this figure drops to approximately 60% in our study. For this study, the scope of bridge and culvert infrastructure was limited to assets that were marked as "in service" in the Bridge Information System (BIS); had the structure type of "Major Bridge," "Minor Bridge," or "Bridge Culvert" (as opposed to retaining walls, dams, spurs, etc.); and included all key information required to place the asset on the deterioration curve. More information can be found on the specifics of the asset selection criterion used for this project in the methodology section of this report. Regardless of the criteria used and specific asset counts, RMA members are responsible for most bridge and culvert structures in the province.

Of course, it was not always this way, and it is critical to remember that bridge maintenance responsibilities were transferred from the Government of Alberta to municipalities over time.

As RMA members are responsible for most of the province's bridges and culverts, the project begins with a focus on bridge infrastructure. There is a considerable amount of provincially collected and municipally collected bridge data available, both of which informed this report.

Reporting and Data Availability

Unique to the bridge portfolio is the significant availability of data. Alberta Transportation maintains the BIS, which tracks and records regular inspections of all bridges and engineered culverts in the province. Municipalities with bridge management responsibilities conduct inspections and the results are submitted into the BIS system. This provides a rich, and largely complete dataset on which to base this analysis.

Funding Programs

In 1991, the Government of Alberta introduced the Guidelines and Procedures (GAP-01) Funding for Municipal Bridge Structures. GAP-01 contained a funding stream known as the Local Road Bridge Program. Along with this program, the responsibility and management for local bridges were transferred to municipalities. However, funding was intended to financially compensate for the work previously done by the Provincial Bridge Department. This program was not without its criticisms, primarily that GAP-01 money was intended to be distributed on a priority basis. In practice, priority basis meant RMA members found annual funding allocations to vary significantly depending upon the Bridge Inspection Maintenance (BIM) program priority ratings, provincial budgets, and government policy. In 2007, RMA passed a resolution to request a "comprehensive, stable bridge replacement initiative and enhanced funding strategy."[2]

In 2011, the province made changes to bridge funding with the introduction of the Strategic Transportation Infrastructure Program (STIP). STIP replaced GAP funding and consolidated the Local Road Bridge Program with several other infrastructure funding initiatives. The Local Road Bridge Program ran for two years under STIP. In 2013, the STIP program was zero-funded, meaning that this program was effectively removed from the budget. Several RMA resolutions were passed to place pressure on the Government of Alberta to reinstate funding as it was critical to supporting and maintaining infrastructure in rural areas. As a result, STIP was reinstated in the

[2] Provincial Funding for Municipal Bridge Structures (GAP-01)

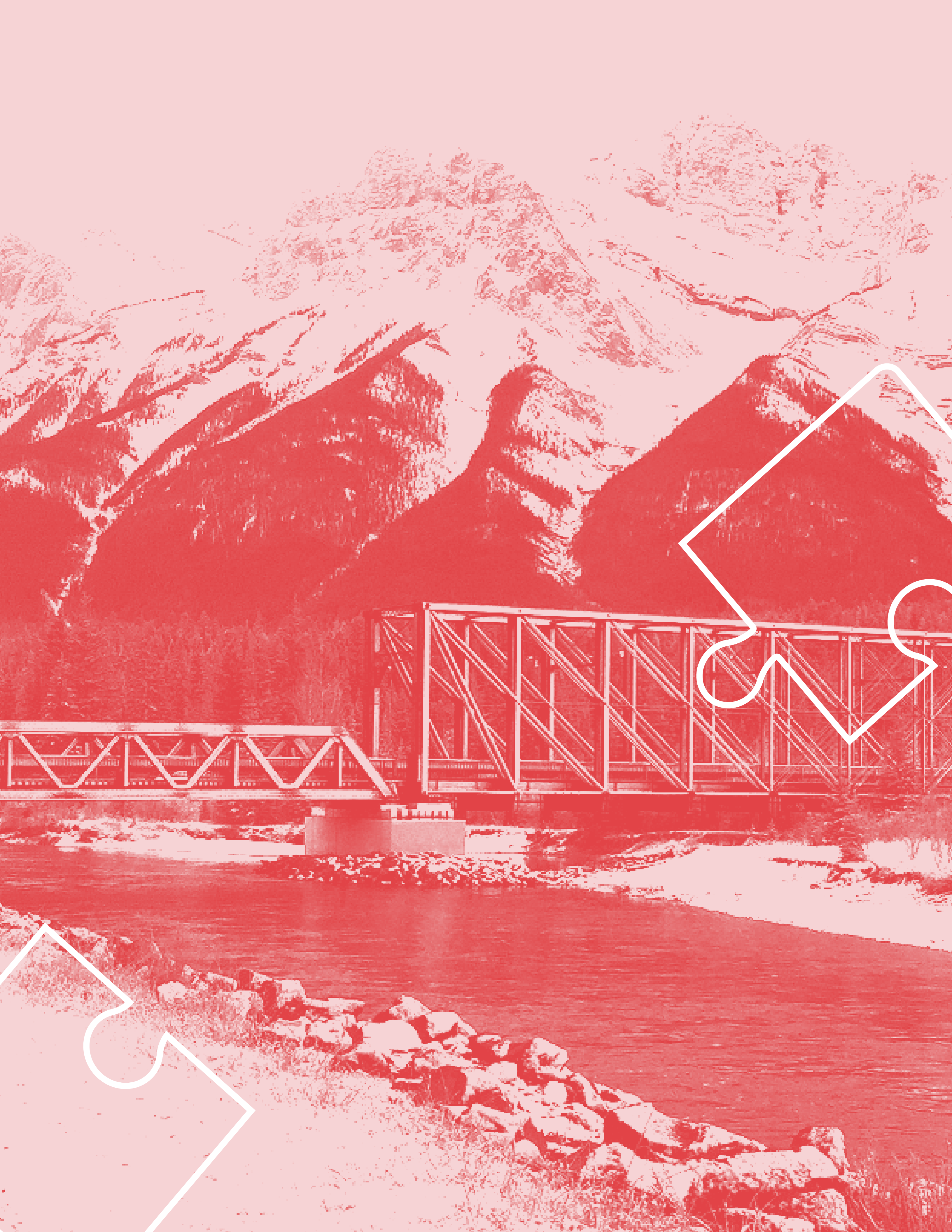
2017-2018 budget at reduced funding levels, and with varied program amounts each subsequent year. Applications for funding under this program are competitive, and Alberta Transportation and Economic Corridors has acknowledged the program is oversubscribed.[3]

RMA Advocacy

RMA has been a strong advocate for consistent funding that supports the growth and sustainability of rural transportation networks, particularly regarding bridge infrastructure on municipal roads. The organization has voiced concerns over the years regarding the underfunding of bridge maintenance, which has resulted in a significant backlog of unfunded repairs.

Historically, the Alberta Government's funding programs, such as the GAP-01 Funding for Municipal Bridge Structures and STIP, have played a crucial role in supporting bridge infrastructure projects. However, funding allocations under these programs have been subject to fluctuations based on various factors, including priorities set by the BIM program, provincial budgets, and government policies. The discontinuation of the Local Road Bridge Program under STIP in 2013 was met with dismay by rural municipalities, prompting RMA to further advocate for the reinstatement of stable and expected bridge funding. Funding allocations for rural municipal bridges has continued to lag in recent years. In 2024, STIP funding is set at \$43.5 million, and is forecasted to decrease to \$32.6 million in 2025 and \$35 million in 2026.[4]

[3] Strategic Transportation Infrastructure Program Funding
[4] Government of Alberta 2024-27 Capital Plan Details by Ministry



Methodology

The primary data source used for this analysis is Alberta Transportation's Bridge Information System (BIS), which is a "web-based application designed to maintain inventory and inspection data for all bridges and bridge-related structures in Alberta."[5] This database was used for the preliminary assessment of bridges and culverts, with BIS data then validated through direct engagement with municipalities.

BIS data was received through a structured data request and filtered to address the needed structures. Data was filtered for:

1. "In Service" bridges and culverts
2. Major Bridge, Minor Bridge, or Bridge Culvert (removal of retaining walls, etc.)
3. RMA member managed assets
4. Removal of assets with missing key information

Municipalities were then sent the bridge data collected from the BIS system, specific to their municipality, and asked to validate the inventory and data. An additional 115 bridges assets were added by municipalities in addition to the BIS data. Less than 0.03% of all bridge assets changed from the provided BIS data.

The final asset count of bridge structures meeting the above criterial was 8,334. The following steps were taken to refine the information and identify the infrastructure deficit:

- Adjustments were made to ensure all cost figures used were in 2023 dollars (Inflation rates used are from the Statistics Canada Consumer Price Index).
- Only 16.77% of bridge/culvert assets have an inspection date in 2023 or 2024; the remainder were manually aged to represent their expected asset condition and life consumed in 2023.
- Standardized useful life figures were applied based on the assigned asset subtype. The useful life was used to determine how far along the curve each asset subcategory moves each year.

ASSET SUBCATEGORY	USEFUL LIFE
Culvert	54
Footbridge	48
Local Bridge	57
Rural Highway Bridge	48

- Weighted averages, based on expected replacement value, were calculated for the effective age and condition level of the overall portfolio.
- Pre-populated workbooks were developed for individual municipal review.
- Workbooks allowed for municipalities to override BIS information if their local records were more accurate or up to date, and to include capital maintenance investment for individual bridge structures.
- Any adjustments made by municipalities within workbooks were applied to the previous BIS-based calculations.

A detailed overview of the methodology used can be found in Appendix B of this report.

[5] Alberta Infrastructure and Transportation Extranet

Data Summary

The data summary section of this report provides an overview of the current profile of bridge infrastructure in rural Alberta.

Portfolio Profile

CATEGORY	RESULT
Number of assets in the portfolio:	8334
Average first in service year:	1979
Average number of assets per RMA member:	121
Oldest asset in the portfolio:	1901, Mackenzie County. Its last inspection was January 2023 and still has a 50% condition rating.
Number of assets with a 100% condition rating:	23
% of assets with less than 50% condition rating:	60.57%

Inspection Recency

LAST INSPECTION DATE	# OF BRIDGES
2024	5
2023	1393
2022	1705
2021	1685
2020	1448
2019	1373
Older than 2019	725

RURAL MUNICIPALITIES of ALBERTA

Bridge Portfolio Ratios

To show the relative importance of the bridge portfolio, we have compared it to established TCA values for all infrastructure for RMA members. This highlights how "big of a deal" the bridge portfolio to RMA members from a fiscal perspective.

This assessment uses two key values from municipal reported Tangible Capital Assets (TCA) values, one for total capital property cost, and one for the net book value of capital property. Both figures express the financial value of the municipality's assets, while total property cost shows the actual or deemed purchase cost, and net book value factors in amortization.

For reference, the following values were taken from the Municipal Financial and Statistical Information for 2022 and summed exclusively for RMA members. The 2022 values are the most up to date at the time of this report's publication.

2022 Total Capital Property Cost

$33,286,347,792

2022 Net Book Value of Capital Property

$17,306,288,055

The bridge portfolio value was compared in its current deteriorated state, its projected, target state (94% condition) and the full replacement portfolio value as if they were brand-new, or 100% condition.

2023 BRIDGES	CURRENT BRIDGE VALUE	TARGET STATE VALUE	FULL REPLACEMENT VALUE
RMA Bridge Portfolio	$2,535,375,194	$4,827,967,276	$5,138,390,499

The following ratios were found:

RATIO	CURRENT BRIDGE VALUE	TARGET STATE VALUE	FULL REPLACEMENT VALUE
Bridges as a % of Total Capital Property Cost RMA TCA Values	7.62%	14.50%	15.44%
Bridges as a % of Net Book Value of Capital Property RMA TCA Values	14.65%	27.90%	29.69%

[6] Municipal Financial and Statistical Information
[7] Municipal Financial and Statistical Information

Overall Deficit Findings

As noted, the infrastructure deficit represents the gap between the current value of infrastructure and its value if it were in an optimal state (94% on the curve). In simpler terms, it's the difference between what we have today and the amount of money we need to invest back into our bridges to ensure they are safe, reliable, and financially efficient. As an example, if a piece of infrastructure, like a bridge, would normally have a 50-year life span, each year we let the bridge sit it can be expected to lose 2% of its expected life. Depending on where the bridge is on the curve, this 2% of life being consumed can result in vastly different condition impacts. We can reverse this natural aging process by reinvesting into the bridge and performing the necessary maintenance to reduce its effective age and bring its condition back up the curve. This process holds for a larger portfolio of assets as well. When we consider multiple bridges, investing in maintenance for one bridge per year may only hold us on the current point of the curve, as the non-repaired bridges naturally age 2% per year.

Value, in this context, is a direct reflection of a bridge's condition. Bridges that are well-maintained and in good repair have a higher value because they are safe, reliable, and capable of supporting the necessary traffic loads. Conversely, bridges in poor condition have a lower value due to the risks and limitations they present.

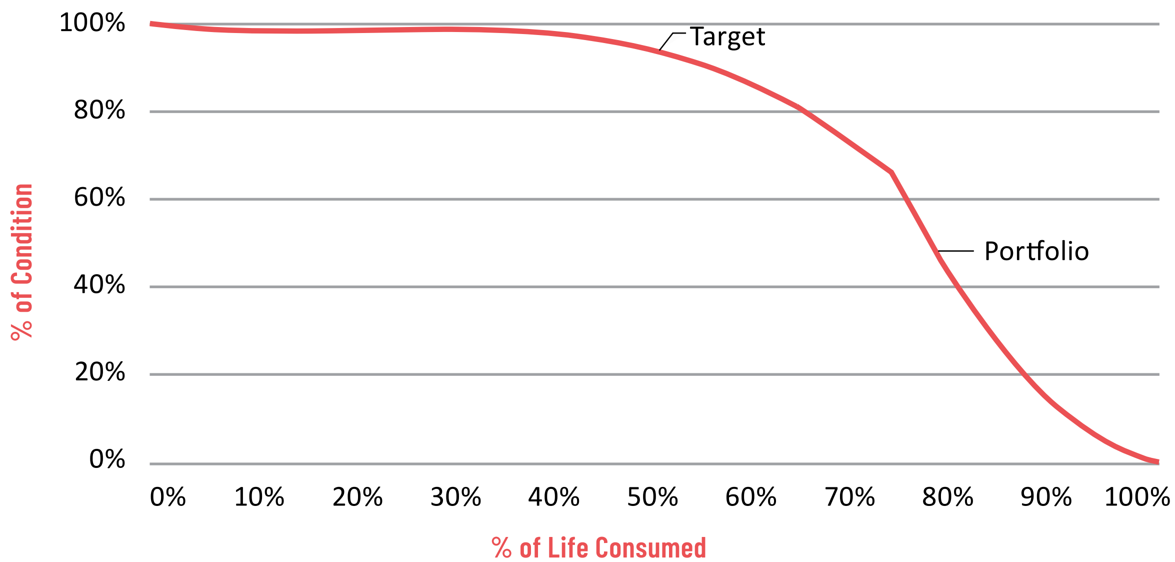
Based on the deterioration curve, a bridge can lose value if it is not properly maintained. Factors like usage, weather conditions, and age can cause a bridge to deteriorate over time. Heavy traffic, extreme weather events, and natural aging processes all contribute to the wear and tear of bridge infrastructure. If the bridge manager does not invest in repairs and maintenance, the bridge's condition worsens, its value decreases, and it becomes less safe and reliable. Therefore, the infrastructure deficit highlights the amount of investment needed to bring the bridges up to their optimal state.

The infrastructure deficit grows when investment in maintenance and repairs is insufficient to keep up with the rate of deterioration. For example, if a bridge requires $1,000,000 in repairs to maintain its condition but only receives $500,000, the deficit increases by the unmet need of $500,000. Over time, if the necessary repairs are not made, the condition of the bridge continues to decline, and the cost to bring it back to an optimal state rises, increasing the deficit. Conversely, the infrastructure deficit shrinks when adequate investments are made to repair and maintain the bridges. Regular maintenance and timely repairs are crucial to managing and reducing the deficit, as they prevent small issues from becoming major problems that are more expensive to fix.

Overall, based on dollar value, Alberta's rural municipal bridge portfolio has a deficit of $2.29 billion. This overall deficit analysis has been supplemented with additional analyses for more specific bridge characteristics, like structure type, structure subtype, traffic count, regional levels, and management. All of these more detailed analyses show bridge infrastructure, no matter what characteristics we look at, is at a **similar poor condition level** and **in need of significant investment**.

Overall Rural Municipal Bridge Infrastructure Deficit

As noted, the overall rural municipal bridge infrastructure deficit is $2,292,592,082. This equates to $3,212 per person based on the total population of the RMA's member municipalities (approximately 714,000 people). The figure and table below show that the overall rural municipal bridge portfolio is well below the target condition level. This is an expensive point of the curve, and increases the risk to fundamental usability, safety and reliability of the transportation network.



While graphically, we can see the portfolio is far below the optimal condition level, it is also helpful to compare some key calculations of where the current bridge portfolio is compared to an idealized target state. The following table shows a comparison between the current bridge portfolio and a hypothetical ideal target state portfolio. The comparison shows overall portfolio values, life consumed, condition, the annual holding cost (investment required to hold the position on the curve), and the effective age.

CATEGORY	CURRENT	TARGET
Portfolio Value:	$2.54 Billion	$4.83 Billion
Life Consumed:	77.60%	50.00%
Condition:	49.34%	93.96%
Holding Cost:	$373.14 Million	$55.71 Million
Effective Age:	41.95 years (useful life 54.05)	27.03 years (useful life 54.05)
Useful Life:	54.10	54.10

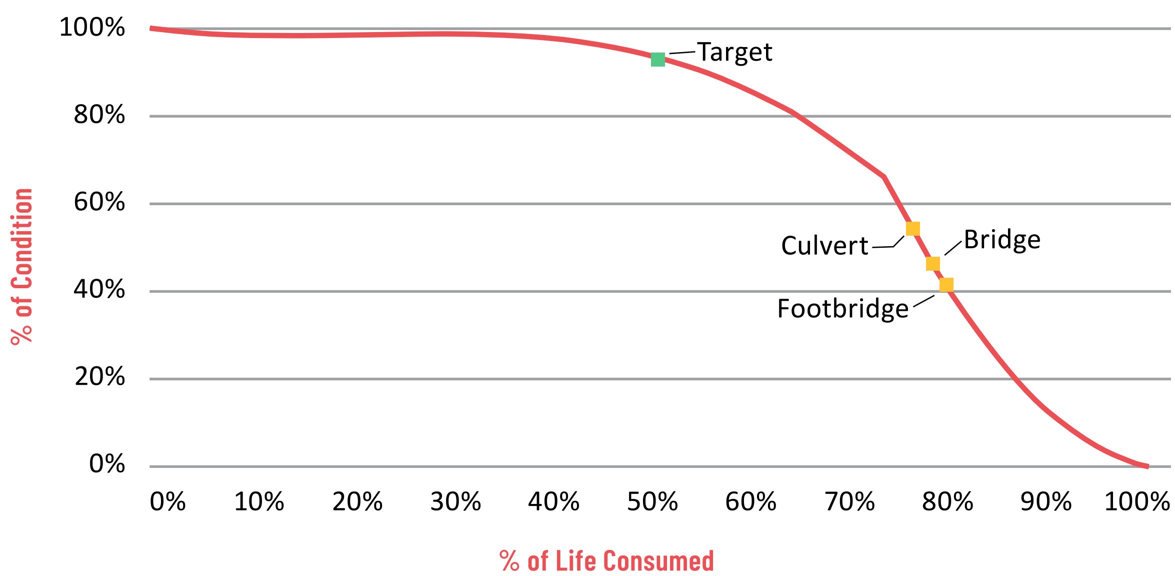
Bridge Characteristic Comparison

The overall bridge portfolio can be categorized in several ways, each providing a unique perspective on the overall condition and needs of the network. Categorizing bridges by type, subtype, and other characteristics allows for a more nuanced understanding of the infrastructure deficit and identifies specific areas requiring attention. This information will allow for more informed decisions about where to allocate resources and how to address the infrastructure deficit most effectively. By highlighting the specific needs of different bridge categories, we can ensure that maintenance and investment efforts are well-targeted and efficient. This approach can not only improve the condition of individual bridges but also enhance the overall integrity and safety of the bridge network.

The sections below show the results of each sub-analysis of various characteristics.

Note: the detailed data these graphs represent can be found in Appendix C.

Bridges by Type



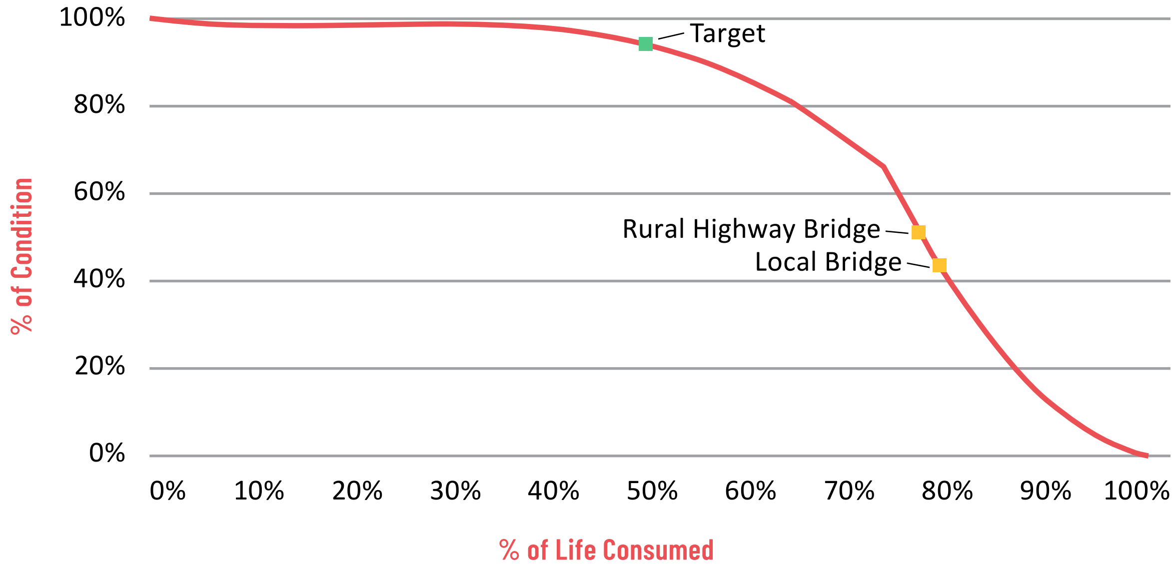
The bridge portfolio is composed of three primary types; culverts, bridges, and footbridges. The majority of the portfolio is composed of culverts, followed by bridges, and finally footbridges.

While culverts are at a slightly higher condition, there is no significant difference between the types observed.

For Consideration:

Bridges and culverts have only a 2.10% life consumed difference, but their conditions vary significantly with an 8.16% difference. This variation reflects the steepness of the deterioration curve at the specific age points for these structures. Although bridges are only 2.10% father along in their lifespan, they have deteriorated much farther down the curve than culverts.

Bridges by Subtype



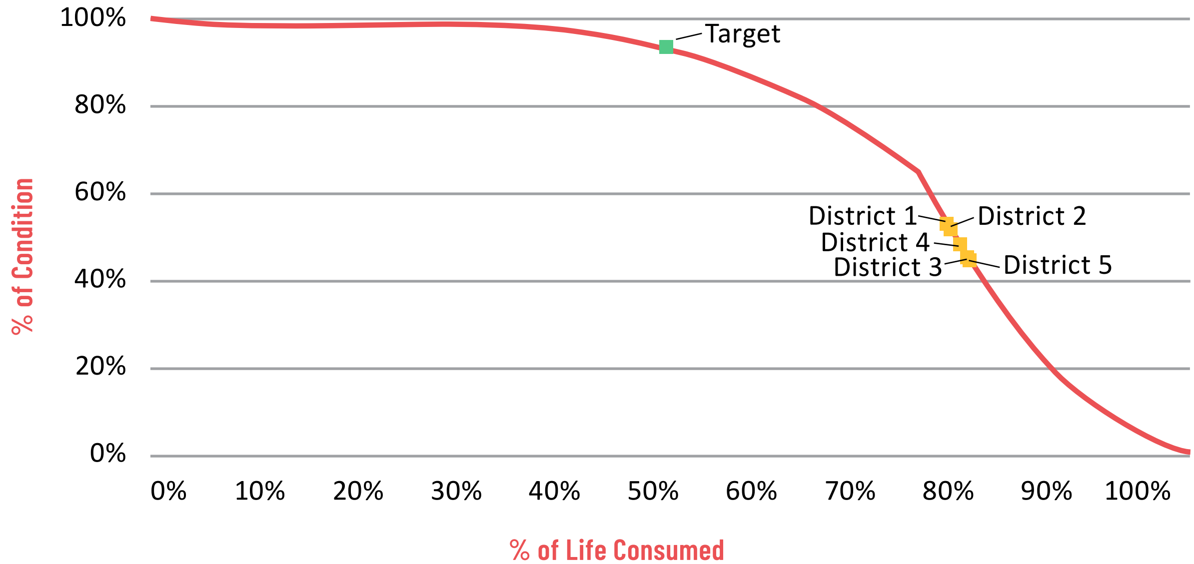
Building off the analysis above, “bridges” as a sub-category can be even further divided into additional sub-types. Most bridges in rural Alberta are local bridges, as opposed to rural highway bridges. Local bridges typically handle low volumes of traffic and provide access to private properties, whereas rural highway bridges manage varying traffic volumes, often at medium to high speeds.

Again, there is no significant difference between the subtypes observed, though highway bridges had the highest condition.

For Consideration:

The financial implications of maintaining these bridges are substantial. For example, the holding cost for local bridges is $6.11 million less than for culverts. However, the total value of local bridges is $267.93 million higher than that of culverts. Despite the condition difference between these two categories being only 10.90%, the cost implications are significant. This highlights the broader financial impact of infrastructure deterioration, emphasizing the importance of timely maintenance and investment to prevent substantial increases in costs as conditions worsen.

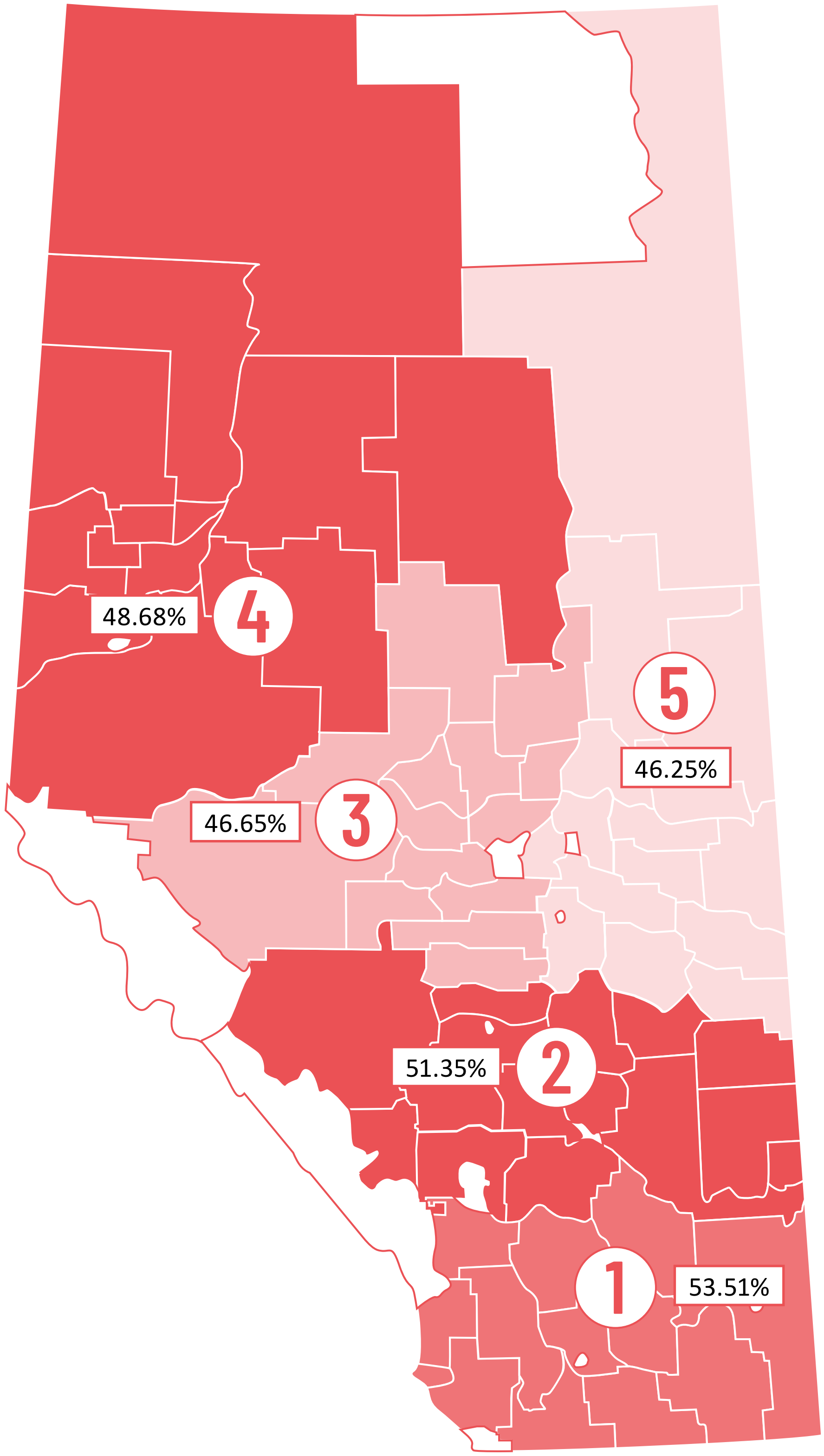
Bridges by District



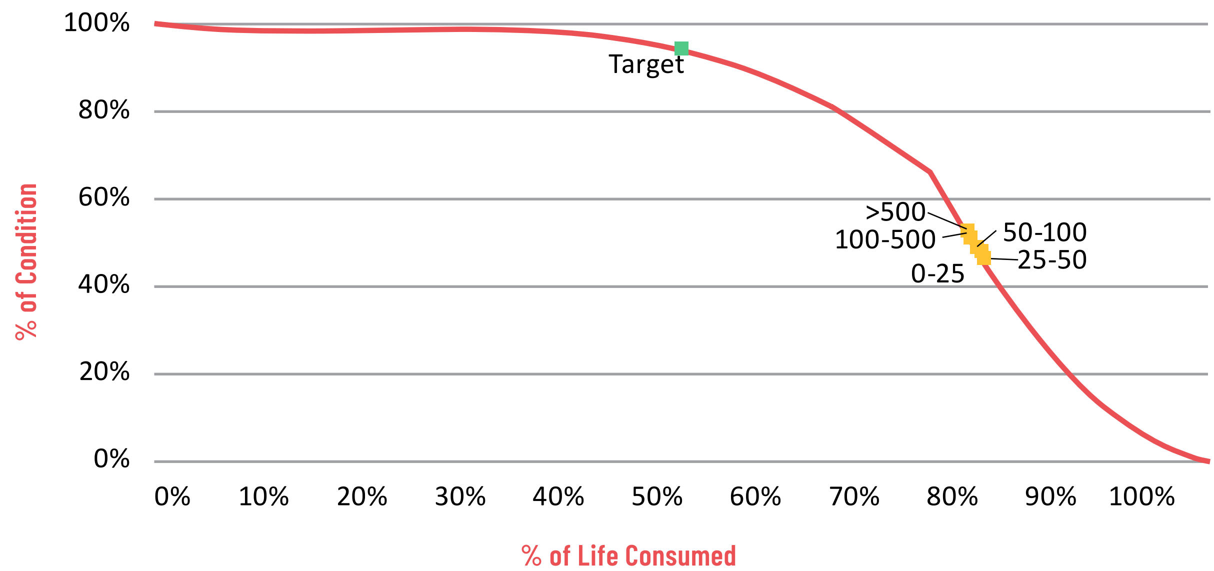
Bridges can also be compared based on location. This analysis considers the current state of bridges and culverts between the RMA's five districts as distinct sub-groups.

There is no significant difference between the districts observed. Overall, District 1's bridges have the highest condition rating, while District 5's are in poorest conditions, though the differences are quite insignificant.

It is clear the deficits seen in bridges impacts all municipalities and all regions of the province in some capacity.


48.68%
4
5
46.25%
46.65%
3
51.35%
2
1
53.51%

Bridges by Traffic Count

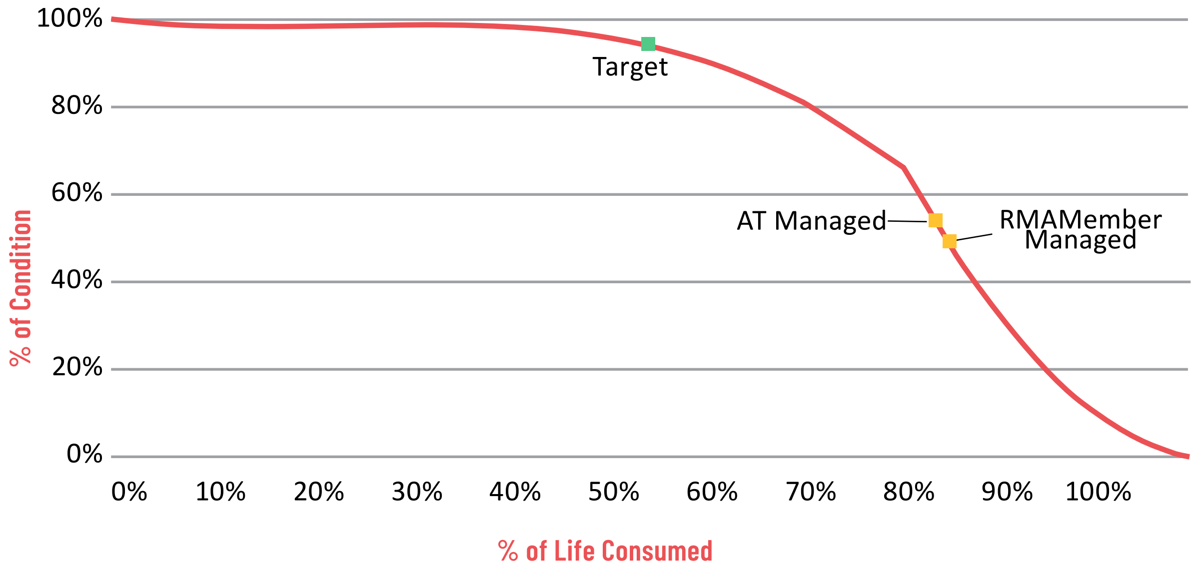


Bridge data also includes estimated average daily traffic counts, which allows for consideration of the relationship between condition and "busy-ness" of bridges. The results show that bridges with traffic counts over 500 are the highest condition, and lower traffic counts have generally lower condition ratings. The higher traffic count bridges likely align closely with the rural highway bridges above.

Again, the overall differences between traffic count categories are minor and not significant.

It is important to note that not all bridge assets had an associated traffic count number from the BIS database. These bridges were subsequently excluded from this specific analysis. However, only 90 bridges were missing this information, making the amount a negligible 1% of all bridge assets.

Bridges by Manager



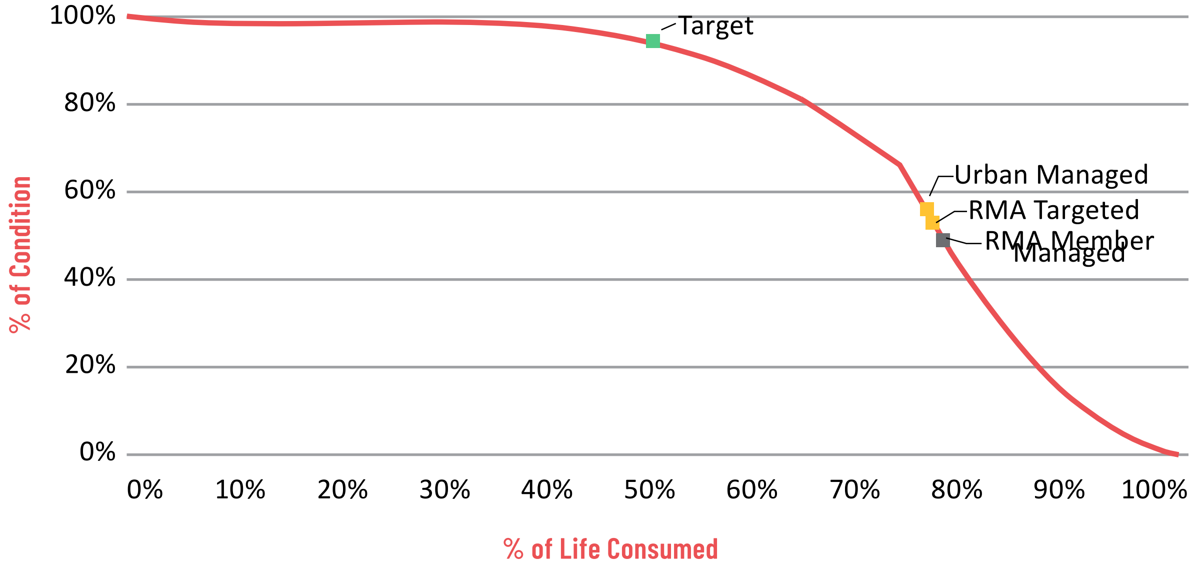
The BIS data also includes bridges managed by Alberta Transportation (AT). The same analysis was conducted to assess the approximately 4,600 AT-managed bridges in relation to the RMA member-managed bridges.

AT managed bridges did have a higher condition rating, but there is no significant difference between the management and condition observed.

For Consideration:

AT-managed bridges are located predominantly on provincial highways and have higher traffic counts. This higher traffic volume necessitates more frequent maintenance and repairs, which can result in better overall condition ratings. When comparing RMA-managed bridges with similar high-traffic counts, the condition ratings are much more similar. This suggests that traffic volume and maintenance investment play significant roles in the condition of bridge infrastructure.

Rural/Urban Bridge Comparison



The BIS data also allowed an opportunity to assess the bridge portfolios of urban municipalities compared to rural municipalities. The analysis shows a similar pattern to the AT analysis above. The urban municipal bridges have the higher condition rating compared to the rural bridges, but the overall difference is fairly insignificant.

It is notable that the bridges in each portfolio differ significantly in terms of their characteristics. To facilitate a more meaningful comparison, a specific subset of rural bridges with the highest traffic counts was also included for this comparison (listed as "RMA Targeted"). This criterion was chosen because the urban bridge portfolio consists of 64% of bridges with traffic counts exceeding 500, whereas the rural portfolio is predominantly concentrated in the traffic count range below 100. With this subset of RMA bridges in the analysis, the differences between rural and urban become very minor.

Financial Summary

As noted above, the overall infrastructure deficit for RMA member-managed bridges and culverts is $2.29 billion. To understand the gravity of this number, there are a few things to consider. Firstly, it is important to understand the meaning of the term “holding cost.”

> **Holding Cost:** How much it costs to keep the portfolio at the same condition level from one year to the next. As an example, if a culvert sits at 50% condition in 2023, it naturally deteriorates to approximately 48% condition in 2024, consistent with the deterioration curve. The cost to “fix” the bridge in 2024 and return it back to 50% condition level constitutes the holding cost.

The holding cost of the rural municipal bridge portfolio at its current level of 49.34% condition is $373,144,367. This means it costs $373.14 million annually just to keep the portfolio’s condition at its current depreciated point. Any investment level below that will result in even further deterioration of the portfolio. As discussed earlier, keeping infrastructure at 94% condition is the least expensive point on the curve year-over-year. If the bridge portfolio received a major one-time investment adequate to raise its overall condition to 94%, the holding cost would decrease significantly to just $59.71 million per year.

PORTFOLIO (CURRENT)	
49.15% condition	$354 Million Holding Cost

PORTFOLIO (IDEAL)		
93.96% condition	$55 Million Holding Cost	7.15 Year ROI

This means that investing $2.29 billion into rural municipal bridges and culverts to bring the portfolio to 94% condition would reduce the year-over-year holding cost by $313 million. This creates a return on investment (ROI) in only 7.31 years. A more targeted investment into only bridges (as opposed to culverts and footbridges) would cost $1.44 billion upfront and save $183 million each year, resulting in a ROI in 7.86 years.

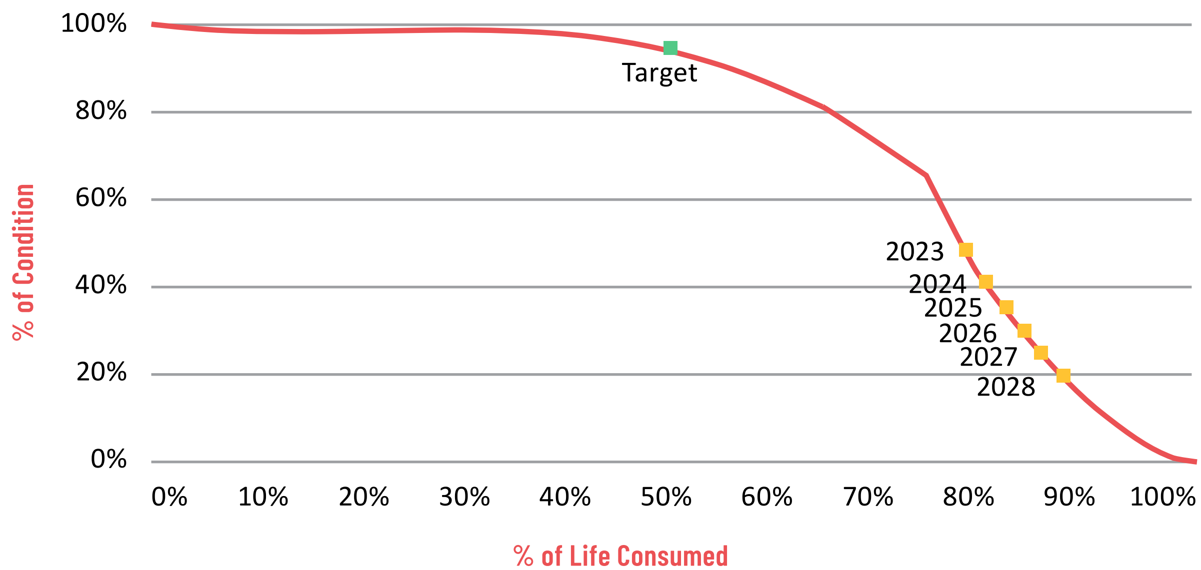
Rural Alberta’s infrastructure sits at a critical point on the deterioration curve. Investment needs to be made now to save significantly in the long term.

Projecting the Future State

The level of investment used to project the future state of the rural municipal bridge portfolio is $31.93 million. This number represents the total project cost of all RMA member bridge projects supported by the Strategic Transportation Infrastructure Program (STIP) and the Municipal Sustainability Initiative (MSI) funding. An average of 2020, 2021, and 2022 values were used to account for variability in funding across years, and the data available as of the time of publication of this report. The STIP program is funded 75% by the Alberta Government and 25% by the municipality themselves. Based on previous RMA analysis conducted in 2018, Alberta rural municipalities already spend nearly 50% of their overall expenses on transportation infrastructure, which is much more than Alberta urban municipalities and municipalities in other provinces (approximately 10%). This suggests that rural municipalities are already spending a disproportionate share of their own-source revenue on roads and bridges, meaning that any significant growth in spending on bridges will have to come from the province.

2023-2028 Outlook

The five-year outlook uses an average of the last three published years of MSI and STIP funding for rural bridge projects. If Alberta continues with the same level of provincial investment[8].[9] ($31.93M) into rural municipal bridges, 2028 will see a dramatically decreased bridge portfolio condition rating. Condition will drop from 49.34% to 21.08%, decreasing the value of the portfolio by $1.45 billion. The bridge network will be unable to keep up with the demand being placed on it, especially at significantly reduced condition levels.



[8] Strategic Transportation Infrastructure Program 2023 Approved projects
[9] Municipal Sustainability Initiative

Rural municipal bridge infrastructure is currently positioned at a critical point on the deterioration curve, with much more rapid deterioration likely to occur soon. The current level of provincial funding is nowhere near enough to maintain the current 49.34% condition rating, accounting for less than 10% of the $373.14 million annual holding cost. **Further, in 2028, the cost to move the portfolio to the 94% target levels will increase to $3.76 billion from $2.29 billion today**. This highlights the urgent need for increased funding and strategic investment to prevent further deterioration and ensure the safety and functionality of the bridge network. As a result, without a significant increase in investment, the condition and value of the bridge infrastructure in rural Alberta will decline rapidly.

Based on the current level of provincial investment, it would cost $1.45 billion in 2028 to return the rural bridge portfolio to its 2023 condition.

In 2028, the holding cost will be $243.91 million annually. This number is so low because the value of the portfolio will have decreased to $1.08 billion. The holding cost will be 22.52% of the entire portfolio value!

YEAR	LIFE CONSUMED	CONDITION	VALUE	HOLDING COST	TARGET HOLDING COST	COST TO REACH TARGET
2023	77.60%	49.34%	$2.56 billion	$373.14 million	$59.71 million	$2.29 billion
2024	79.40%	42.70%	$2.19 billion	$354.32 million	$59.71 million	$2.63 billion
2025	81.20%	36.43%	$1.87 billion	$328.95 million	$59.71 million	$2.96 billion
2026	82.90%	30.65%	$1.57 billion	$289.16 million	$59.71 million	$3.25 billion
2027	84.60%	25.64%	$1.32 billion	$266.53 million	$59.71 million	$3.51 billion
2028	86.30%	21.08%	$1.08 billion	$243.91 million	$59.71 million	$3.76 billion

Other Findings and Considerations

Infrastructure resiliency is a growing concern:

Climate change is expected to have significant impacts on infrastructure, including increased risks of fire, flooding, erosion, and other severe weather events. Combined, this can overtax infrastructure, impact expected lifespans, require more regular maintenance, or require major rehabilitation interventions over and above regular expected maintenance investment. A bridge portfolio that is already showing signs of underinvestment may deteriorate even faster with the impacts of climate change.

Of course, these risks are not only financial, especially for bridges where safety is paramount. Bridges must be designed and maintained to withstand the regular forces of nature, and will now have to contend with an increased frequency of major, "one-in-a-hundred year" events including high winds, heavy rainfall, snow loads, and flooding. Regular inspections and maintenance are crucial to ensuring that bridges remain safe and structurally sound, even in the face of adverse weather conditions. In fact, one of the key resiliency measures is to ensure assets are in good condition to begin with.

Beyond maintenance, ensuring climate resiliency may require adjustments in materials and construction techniques as well. These adaptive remediations may be required outside of normal investment cycles, further increasing the needed investment into the portfolio. Of course, these adaptive measures may be more expensive. Overall, there is a clear need for investment into climate adaptation and resiliency as it relates to infrastructure. This level of investment will likely be higher than the standard "target state" holding cost given the impacts of climate change.

There is increasing need for additional bridge funding:

There is also a need for continued investment in infrastructure maintenance and renewal to address the existing infrastructure deficit and ensure that infrastructure remains safe, reliable, and resilient. This includes investing in bridge rehabilitation and replacement projects to address deteriorating infrastructure and improve overall network performance. When considering new investment, adopting new technologies in the construction and maintenance of bridges will be essential for improving efficiency, safety, and resilience. Technologies such as advanced materials, sensors, and data analytics can help municipalities better understand the condition of their bridges, predict maintenance needs, and optimize repair and replacement schedules. By embracing innovation, municipalities can reduce long-term maintenance costs and ensure that their bridge infrastructure remains safe and reliable for years to come.

What's Next?

Future phases of this project will apply similar analysis to the infrastructure deficit for roads and utilities. This will provide a more comprehensive understanding of the overall infrastructure deficit faced by Alberta's rural municipalities. By examining a wider range of assets, we can gain insight into the broader challenges and investment needs of the province's rural infrastructure network.

The final report will consolidate the findings from each individual asset type report, summarizing the total infrastructure deficit for all asset categories. This comprehensive overview will offer stakeholders a clear picture of the scale of the infrastructure challenge faced by rural municipalities and recommendations to address it.

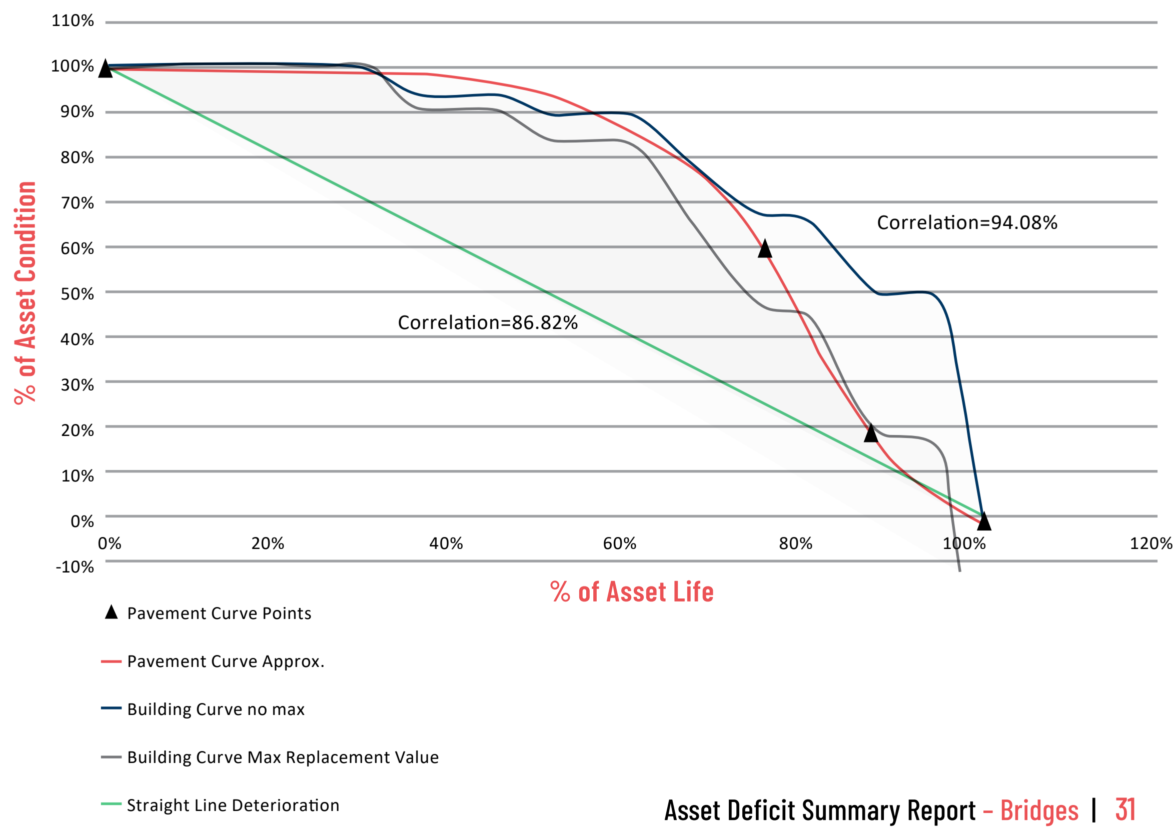
If you have questions about this report, or any others in the series, please reach out to Wyatt Skovron, General Manager of Policy & Advocacy at wyatt@RMAlberta.com.

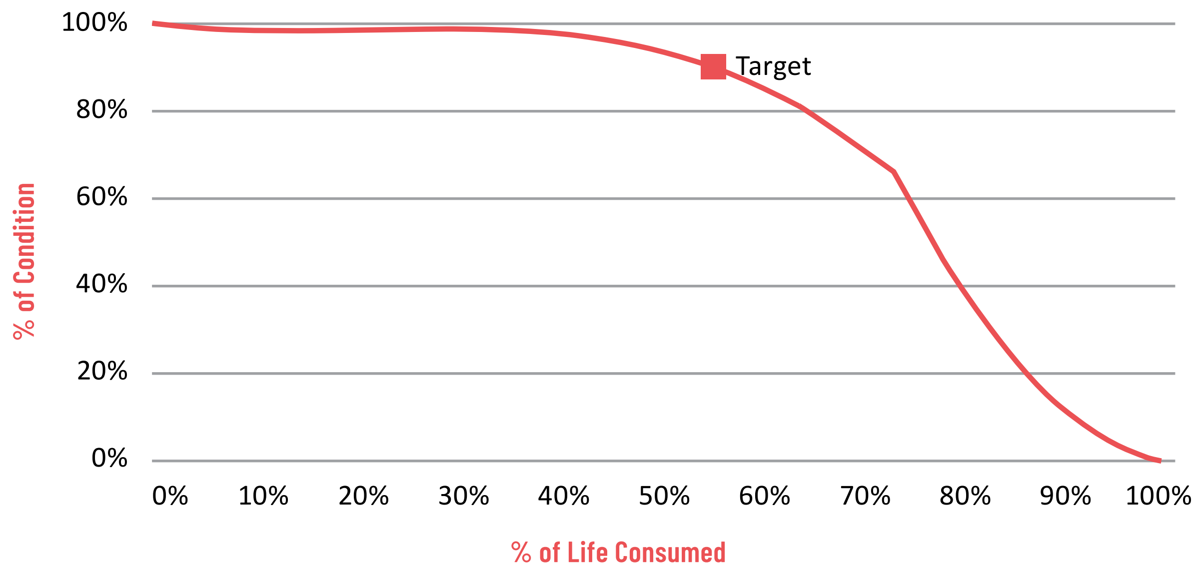
Appendix A: Deterioration Curve Technical Data

Two different deterioration curves have been used to analyze the state of rural infrastructure in Alberta. The first curve, an S-Curve, is used for bridges and roads. The S-Curve was adapted from a standard pavement deterioration curve. The second deterioration curve, the Utility Curve, is used for utility (water, wastewater, and stormwater) infrastructure. The Utility Curve was adapted from a standard sanitary sewer deterioration curve. Both curves are mathematical formulas that forecast the condition of the overall portfolio based on the weighted average point in the asset's life.

S-Curve

In the early 2000s, it was determined that the S-Curve has a 94% correlation with a building deterioration curve provided by Alberta Infrastructure's asset management methodology. An Alberta Parks and Protected Areas report completed at that time validated the use of the standard pavement deterioration curve to approximate the deterioration of all infrastructure classes in the Parks and Protected Areas portfolio by comparing the predicted rate of decline with data provided from the Infrastructure Information Management System (IMS). Using the IMS, the primary comparison drawn predicted the cumulative maintenance expenses for a 500 sq. ft., stick frame constructed building. The results were then correlated with the pavement curve, assuming a 30-year life of the building. The result was a correlation of 94.08%. When contrasting the deterioration curve with a straight-line curve (traditionally used in accounting), the straight-line curve resulted in a lower correction of 86.97%.

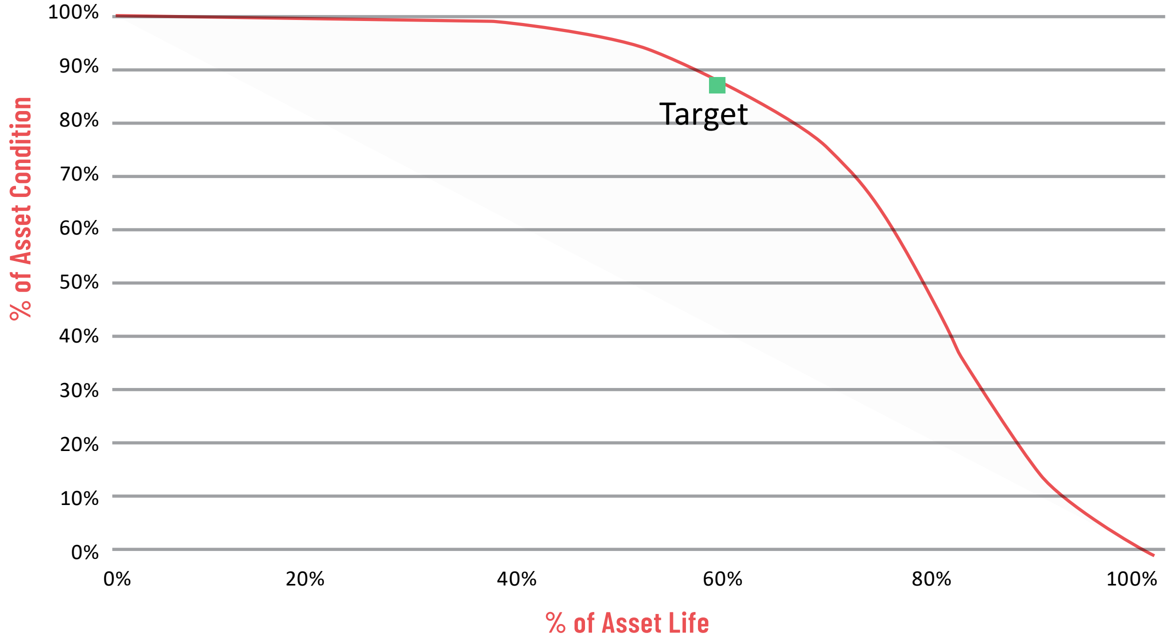




The target point of the S-Curve is a derived calculation which considers the life consumed compared to the slope (i.e. holding cost) of the curve at any given point. It is intuitive that the best value point on the curve is one where we have utilized as many of the 'cheap' years of an asset, while not letting it start to slide down to steeper points on the curve. The S-Curve begins to slope downward at 50% of the infrastructure life span (94% condition). The most economical option is if the curve can be prevented from dropping by lengthening the infrastructure life at this point. The holding cost is determined by the required investment to stay at the same point on the curve, year over year. The deficit calculation is based on the one-time investment required to move the portfolio to its target state (50% of life expectancy).

Utility Curve

Through the development of this project, it became apparent that the standard S-curve would provide an effective model for all asset types that are in-scope. In particular, we observed a number of instances, including from RMA members, where the standard deterioration curves for utility infrastructure were quite different than the standard S-curve model above. While consensus of a baseline utility curve appears to be less settled than pavement, it was decided to leverage utility modelling conducted by the City of Ottawa[10] to derive our utility curve. Specifically, a curve-fitting exercise was conducted on a published sanitary infrastructure curve to derive the curve below.



Despite the change in shape, the Utility Curve functions similarly to the S-curve above. The optimum point is a derived calculation which considers the annual investment required to keep assets at the previous year's condition level. Keeping assets at this condition through investment will keep annual depreciate below the annual change in value of the depreciating asset.

However, the Utility Curve does not have the same inflection points as the S-curve above, so the key point of acceleration is less prominent. As a result, the target point of the Utility Curve is a different derived calculation which considers annual investment required to keep assets at the previous year's condition level. It is again intuitive that the best value point on the curve is one where we have utilized as many of the 'cheap' years of an asset, while not letting it start to slide down to steeper points on the curve. The steepest slope of the Utility Curve beings at around 64% of the infrastructure life span (87% condition). The most economical option is to keep assets at this condition, where annual depreciation will stay below the annual change in value of the depreciating asset.

[10] Strategic Asset Management Plan

Like the S-curve above, through investment, the curve can be prevented from dropping by lengthening the infrastructure life at this point. The holding cost is determined by the required investment to stay at the same point on the curve, year over year. The deficit calculation is based on the one-time investment required to move the portfolio to its target state (64% of life expectancy).

As noted, this curve will only apply to various utility infrastructure for that specific report, and is not applied to the bridge and culvert or road reports.

Deterioration Curves Interpretation

Regardless of the specifics of the deterioration curve being used, using a deterioration curve results in a better analysis of the infrastructure deficit than the standard straight-line deterioration method used in Tangible Capital Asset (TCA) accounting. The first key advantage of this curve over the traditional straight-line depreciation approach is its ability to account for varying rates of degradation over an asset's lifespan. The assumption of the same level of annual degradation in the straight-line approach means there is no optimal point to maintain assets, leading to potentially inefficient allocation of resources. Additionally, the accounting-focused straight-line approach tends to underestimate an asset's condition early in its lifespan and overestimate it later when investment is critical, which can result in suboptimal asset management decisions. In contrast, the curve used in this analysis provides a more realistic and asset-management focused view of infrastructure deterioration. By incorporating factors such as the optimal condition to maintain assets and the varying rates of degradation over time, this approach offers a more accurate assessment of the infrastructure deficit. This is particularly valuable for long-term planning and decision-making, as it allows municipalities to prioritize maintenance and investment efforts based on the actual condition of their assets.

Assets can be manually moved up and down a deterioration curve. To theoretically "age" an asset, its useful life is used to move the asset along the curve each year. For example, an asset with a useful life of 50 years would move down the x-axis at 2% each year. In year zero, the asset would have a 0% life consumed, and consequently, a 100% condition. As an example of how this applies to the S-curve above, in year one, the life consumed would be 2%, and the condition would be 99.52%. At year 25, the life consumed would be 50%, and the corresponding condition would be 93.96% . However, this assumes no investment into the asset. If investment is made into the asset, the asset would move up the y-axis based on the change to asset condition. For example, if an asset at 40% condition, and 80% life consumed receives an investment that improves its condition by 10%, the asset would move up the y-axis to 50% condition with a corresponding 77.5% life consumed. This essentially 'de-ages' the asset, extending its actual life. The utility curve functions similarly, though specific values will change.

Appendix B: Technical Methodology

To calculate the overall rural municipal infrastructure deficit, it was critical to be able to place the current state of infrastructure on the deterioration curve outlined above. To do this, two key pieces of information are needed: the ideal value of the infrastructure portfolio and the actual current value of the infrastructure. The deficit is calculated by subtracting the current value from the ideal value. However, it is important to note that the ideal value of infrastructure is not the same as the value of brand-new infrastructure. As shown in the “Deterioration Curve” section of the report, infrastructure should ideally be maintained at approximately 94% condition with 50% of its life consumed.

To complete the analysis of the infrastructure deficit there are two paths to calculate the total deficit, depending on what information is available on the asset. Both paths require:

- Structure Type
    - ex. Bridge, road, culvert.
- Useful Life
    - Pre-populated in the workbook based on Infrastructure Canada standards. Municipalities were encouraged to override the provided value if their if their municipality uses a different expected useful life than the one prefilled.
- Estimated Replacement Cost
    - How much it would cost to fully replace the asset.

The first path relies on two key pieces of information for each asset: the condition assessment and last inspection date. The condition assessment is the y-axis of the deterioration curve and represents the average condition of the infrastructure as a percentage of its value. The last inspection date is required to ensure all assets can be viewed in 2023 dollars. The second path is used when the condition assessment is not available. This path requires the first in service year and the total capital investment into the asset. The first in service year is also the date of construction, and the total capital investment into the asset is the total dollar amount of capital that has been invested into this asset. This does not include scheduled maintenance or daily operating costs.

The following sections outline the various phases of work that were conducted to achieve placement on the deterioration curve.

Bridge Information System Data

The Bridge Information System (BIS) is a "web-based application designed to maintain inventory and inspection data for all bridges and bridge-related structures in Alberta."[11] This database was used as a primary source for preliminary assessment of bridges and culverts, though this information was eventually validated through direct engagement with municipalities as well.

A data request was sent to Alberta Transportation and Economic Corridors to receive the data contained in the BIS in an Excel-based format. This data was received and subsequently filtered to form the basis of the bridge data. The filtering process required several steps:

1. Received three files from the Government of Alberta containing 202 data fields for ~25000 bridges.
    - 15 data fields were relevant to this project.
2. Filtered to "In Service" bridges (~16000)
    - This removed bridges that are cancelled, proposed, removed, etc.
3. Filtered to Major Bridge, Minor Bridge, or Bridge Culvert (~15000)
    - This took out items such as retaining walls, dams, spurs, etc.
4. Filtered to RMA member managed only (~8400)
5. Filtered out any bridges missing key information (~8300)
    - Key information is condition assessment and replacement value.
6. Municipalities were then asked to confirm their data as represented in the BIS system (+115 assets)
7. Total bridges: 8334

BIS Data Standardization

The information in the BIS database does not contain dates as to when the values for the estimated replacement cost were entered. As a result, it is impossible know whether the value has been adjusted for inflation. The estimated replacement cost provided from the BIS database has been assumed to be representative of the last time the bridge was inspected. Municipalities directly providing data were asked to include the "year replacement cost was estimated." Municipalities were asked to consider the year in which their dollars are valued. The example given was:

If you've planned to spend $10 million to replace the asset in 2034 and you've already adjusted for inflation to 2034, enter 2034. If your estimate is in today's dollars (for example, $10 million in 2023 dollars), enter 2023. The inverse is also true, if in the year 2000 you estimated it would cost $5 million to replace the asset in 2024, and you end up spending the current value of $5 million (let's say it's $8 million now), please enter 2000. If you considered inflation in 2000 and today you've spent $5 million, enter 2023.

[11] Alberta Infrastructure and Transportation Extranet

When workbooks were received back from all municipalities who chose to participate, the deficit calculations began. In the analysis and calculation of the deficit, all dollar values been moved to be representative of 2023 values. This helps to ensure consistency across municipalities and asset categories. Inflation rates used are based directly on the Statistics Canada Consumer Price Index.[12]

In keeping with the idea of consistency, where required, all assets have been manually "aged" to reflect condition as of 2023. This involves utilizing the asset's "useful life." To categorize the useful life of assets, we turned to the Government of Canada Statistics: Infrastructure Canada data.[13] This data was released in 2022 and contains information for the asset categories of road assets, potable water assets, culture, recreation and sport facilities, wastewater assets, stormwater assets, and public transit assets. The data is entitled "Average expected useful life of new municipally owned [asset category], by urban and rural, and population size, Infrastructure Canada." Where data exists, we have selected the average useful life specific to Alberta rural municipalities. When the rural category is not available, the Alberta urban municipalities value was selected. In very few categories, specific subcategories were not documented in the Infrastructure Canada database. In these cases, data was collected from various sources such as the participant workbook for the course "Asset Management for Municipal Staff: The Technical Basics,"[14] and targeted to rural Alberta as much as possible.

The primary subcategories used in the Bridge and Culvert category are Culvert, Footbridge, Local Bridge, and Rural Highway Bridge. The following table contains a brief definition of the subcategories and their useful life.

ASSET SUBCATEGORY	DEFINITION	USEFUL LIFE (YEARS)[15]
Culvert	A structure that channels water past an obstacle or to a subterranean waterway	54
Footbridge	A bridge designed solely for pedestrians	48
Local Bridge	Local bridges are defined as bridges that provide for low volumes of traffic and access to private properties; local bridges are designed for low speeds, have capacity for two undivided lanes of traffic; through traffic is discouraged and parking is usually permitted though often controlled.	57
Rural Highway Bridge	Rural bridges are defined as bridges that move varied traffic volumes depending on location, are medium to high speed, and are usually one, but sometimes two lanes in each direction. These highway bridges usually have no dividing strip and allow for direct access from adjacent developments.	48

An "Other" option was provided to municipalities to include assets that fell under the category of Bridges and Culverts but did not fall into one of the subcategories. This option was not utilized for bridge assets.

[12] Consumer Price Index, annual average, not seasonally adjusted
[13] Statistics Canada: Infrastructure
[14] Asset Management for Municipal Staff: The Technical Basics
[15] Average expected useful life of new municipally owned bridge and tunnel assets, Infrastructure Canada

To age the asset to 2023, the useful life was used to determine how far along the curve each asset subcategory moves each year. Except in cases where municipalities have indicated otherwise through the workbook, this involved assuming that no investment has been made into the asset since its last inspection date. Only 16.77% of bridge/culvert assets have an inspection date in 2023, the remainder have been manually aged to represent their expected asset condition and life consumed in 2023. In some cases, the result of the calculated condition rating or life consumed exceeded 0% or 100%, respectively. In these cases, the bridges were capped at 0% condition and 100% life consumed. However, the manually capped bridges account for less than 0.4% of all bridges. More details regarding the manual aging process can be found in the following section entitled “Deterioration Curve.”

Member Engagement

To supplement/verify BIS data, a request for asset management data was sent to all RMA members. This request included a stakeholder primer and requested volunteers to participate in the process, if they felt they had appropriate asset management data available. Municipalities were also provided with individualized workbooks during this engagement process, with pre-populated information for the member municipality. During this time, the project team presented work completed to date at the 2024 Spring RMA Convention. The combination of personalized requests and publicity for participation resulted in an up-tick in project participation throughout RMA membership. 30 of 69 RMA members provided data to be utilized in this project. RMA is extremely grateful to all members who participated in this process and were able to provide any asset management data to the project. Municipalities that were unable to provide information are represented in the deficit calculation through an extrapolation process.

Infrastructure Workbook

To make collecting the required data as easy and uniform as possible, the project team created a workbook that was sent to all 69 rural municipalities in Alberta. This workbook was intended to collect detailed information on various infrastructure assets, including roads, bridges, and utilities. The data collected from these workbooks aimed to quantify the rural municipal infrastructure deficit, providing a foundation for informed advocacy and future planning. The workbook contained an introduction, FAQ, and separate tabs for each category of infrastructure (bridge, roads, and utilities). Specific directions to fill out the workbook and which data fields were required for each asset were clearly explained. The data fields were colour coded as follows:

GREEN: Mandatory for ALL assets.

GREY: Optional but helpful. Please try and fill out these fields if possible.

ORANGE: Mandatory. If you do not have this data, please see the blue columns.

BLUE: If you do not have data for all orange columns, all blue columns are required.

The following columns were requested for bridge assets:

- Green
    - Structure Type (dropdown menu)
    - Useful Life (pre-populated)
    - Estimated Replacement Cost

- Grey
    - File Number
    - Description or Name
    - Other (Please Describe)
    - If the Structure Type selected is “Other” this field becomes mandatory to describe the structure type
    - Primary Usage
    - Managed By
    - Year Replacement Cost was Estimated
    - Estimated AADT
- Orange
    - Condition Rating
    - % Condition Rating (if different than condition rating)
    - Last Inspection Date
    - Blue
    - First in Service Year
    - Capital Investment into Asset

Note: The bridge information from the BIS system was pre-populated in the individual workbooks sent to municipalities. Municipalities were advised their bridge information would be pre-populated based on publicly available Government of Alberta Bridge Information System data. However, it is possible this information may not be complete for every bridge asset, or the municipality may have more up-to-date information. In this case, municipalities were encouraged to add any data that may be missing and override any incorrect or outdated data. Any data received back from the municipalities that contradicted the BIS information was taken to be more accurate and included in place of the BIS information. Modifications were made to less than 0.03% of the BIS information.

Extrapolation Process

Specific to the bridge infrastructure portfolio, no extrapolation has been conducted as a complete dataset was received from Alberta Transportation for all 69 RMA members. More details can be found in the section entitled “Bridge Information System.”

Appendix C: Bridge Characteristic Comparison Data

Bridges by Type

BY TYPE	LIFE CONSUMED	CONDITION	VALUE	CURRENT HOLDING COST	TARGET HOLDING COST	COST TO GET TO TARGET
Bridge	78.50%	45.98%	$1,378,641,049	$217,718,031	$34,839,571	$1,438,326,377
Culvert	76.40%	54.14%	$1,149,965,697	$154,248,317	$24,683,051	$845,792,221
Footbridge	79.60%	41.72%	$6,768,447	$1,178,020	$188,509	$8,473,484

Bridges by Subtype

BY SUBTYPE	LIFE CONSUMED	CONDITION	VALUE	CURRENT HOLDING COST	TARGET HOLDING COST	COST TO GET TO TARGET
Footbridge	79.60%	41.72%	$6,768,447	$1,178,020	$188,509	$8,473,484
Culvert	76.40%	54.14%	$1,149,965,697	$154,248,317	$24,683,051	$845,792,221
Local Bridge	79.20%	43.24%	$882,030,865	$148,136,511	$23,705,030	$1,034,648,822
Rural Highway Bridge	77.00%	51.83%	$496,610,184	$69,581,519	$11,134,541	$403,677,555

Bridges by District

BY DISTRICT	LIFE CONSUMED	CONDITION	VALUE	CURRENT HOLDING COST	TARGET HOLDING COST	COST TO GET TO TARGET
District 1	76.60%	53.51%	$557,338,732	$75,634,439	$12,103,138	$421,265,339
District 2	77.10%	51.35%	$574,544,568	$81,255,438	$13,002,619	$476,787,388
District 3	78.30%	46.65%	$583,856,281	$90,891,281	$14,544,561	$592,150,034
District 4	77.80%	48.68%	$424,936,660	$63,393,644	$10,144,347	$395,288,606
District 5	78.40%	46.25%	$394,698,953	$61,969,565	$9,916,464	$407,100,715

Bridges by Traffic Count

BY AADT	LIFE CONSUMED	CONDITION	VALUE	CURRENT HOLDING COST	TARGET HOLDING COST	COST TO GET TO TARGET
>500	76.70%	52.94%	$105,587,292	$14,484,848	$2,317,887	$81,826,427
100-500	77.00%	51.66%	$630,957,981	$88,702,538	$14,194,315	$516,729,048
50-100	77.90%	48.23%	$607,941,138	$91,527,484	$14,646,367	$576,296,753
25-50	77.80%	48.68%	$675,184,220	$100,726,818	$16,118,459	$628,080,205
0-25	78.20%	47.09%	$470,803,019	$72,599,222	$11,617,438	$468,529,582

Bridges by Manager

BY TYPE	LIFE CONSUMED	CONDITION	VALUE	CURRENT HOLDING COST	TARGET HOLDING COST	COST TO GET TO TARGET
RMA Member Managed	77.60%	49.34%	$2,535,375,194	$373,144,367	$59,711,130	$2,292,592,082
AT Managed	76.60%	53.62%	$4,458,333,657	$525,610,139	$75,191,294	$3,353,617,391

Rural/Urban Bridge Comparison

BY TYPE	LIFE CONSUMED	CONDITION	VALUE	CURRENT HOLDING COST	TARGET HOLDING COST	COST TO GET TO TARGET
RMA Member Managed	77.60%	49.34%	$2,535,375,194	$373,144,367	$59,711,130	$2,292,592,082
Urban Managed	76.00%	55.81%	$2,855,669,074	$296,096,120	$43,034,183	$1,951,941,485
RMA Targeted	76.70%	52.94%	$105,587,292	$14,484,848	$2,317,887	$81,826,427

RMA

RURAL MUNICIPALITIES of ALBERTA

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