



## Town of Sedgewick - Asset Management Plan

---



**Version** 1.0

**Date** November 5, 2020

## TABLE OF CONTENTS

<b>TABLE OF FIGURES</b> .....	<b>2</b>
<b>SUMMARY</b> .....	<b>3</b>
<b>INTRODUCTION</b> .....	<b>3</b>
<b>INTENT</b> .....	<b>3</b>
<b>STRATEGIC ALIGNMENT</b> .....	<b>3</b>
<b>METHODOLOGY</b> .....	<b>4</b>
<b>LIMITATIONS AND ASSUMPTIONS</b> .....	<b>7</b>
<b>DATA COMPLETENESS AND QUALITY</b> .....	<b>8</b>
<b>ASSET CLASS SUMMARY</b> .....	<b>9</b>
<b>CONCLUSION</b> .....	<b>14</b>
<b>RECOMMENDATIONS</b> .....	<b>15</b>
<b>REFERENCES</b> .....	<b>16</b>

## TABLE OF FIGURES

<b>FIGURE 1: EXAMPLE OF DETERIORATION CURVE FROM 2019 CANADIAN INFRASTRUCTURE REPORT CARD</b> .....	<b>5</b>
<b>FIGURE 2: OVERALL DATA QUALITY AND COMPLETENESS CHART</b> .....	<b>8</b>
<b>FIGURE 3: ROAD NETWORK INVENTORY</b> .....	<b>9</b>
<b>FIGURE 4: ROAD NETWORK DATA COMPLETENESS</b> .....	<b>9</b>
<b>FIGURE 5: BRIDGE AND CULVERT INVENTORY</b> .....	<b>10</b>
<b>FIGURE 6: CULVERT DATA COMPLETENESS</b> .....	<b>10</b>
<b>FIGURE 7: WATER NETWORK INVENTORY</b> .....	<b>10</b>
<b>FIGURE 8: WATER NETWORK DATA COMPLETENESS</b> .....	<b>11</b>
<b>FIGURE 9: SANITARY NETWORK INVENTORY</b> .....	<b>12</b>
<b>FIGURE 10: SANITARY NETWORK DATA COMPLETENESS</b> .....	<b>12</b>
<b>FIGURE 11: STORM SEWER INVENTORY</b> .....	<b>12</b>
<b>FIGURE 12: STORM SEWER DATA COMPLETENESS</b> .....	<b>13</b>
<b>FIGURE 13: REPORT RECOMMENDATIONS</b> .....	<b>15</b>

## SUMMARY

The intent of this Asset Management Plan is to outline how the Town of Sedgewick proposes to achieve its municipal objectives through asset management.

The Asset Management Plan's methodology is based on best practices available to the municipality, from sources such as the Federation of Canadian Municipalities (FCM), interviews with municipal staff, and MuniSight Ltd. To systematically analyze the municipality's asset information, its infrastructure was sorted into various asset classes and evaluated against standard asset condition, level of service, and asset risk considerations. Asset Inventory lists were generated based on the data from the Town of Sedgewick's MuniSight webmap software and interviews conducted with select municipal staff.

Although this plan was developed to be as robust as possible, it is limited by a series of assumptions. Primarily, that historical figures are being used to predict future behavior, so any major changes to economic, social, political, or environmental considerations will impact the validity of this report.

After reviewing the relevant asset data available, it is the conclusion of this report that the Town of Sedgewick is at the early stages of developing an effective asset management process. The municipality is at the early stages of collecting asset data (such as condition, level of service, replacement cost, and risk) and does not have enough information to make conclusions about the overall state of infrastructure assets. Developing an asset management process can take place in stages, over many years, and the municipality has taken a significant first step in the development of this asset management plan. It is recommended the municipality continue to develop asset management capabilities in their people, processes, and data systems. Several key recommendations are highlighted in this report to help the municipality focus on the actions with the highest positive potential impact.

## INTRODUCTION

### INTENT

The intent of the Asset Management Plan is to provide a 10,000 ft view of the life cycle activities that a municipality must execute to achieve the desired level of service goals as detailed in their Asset Management Strategy. The Asset Management Plan should provide information on the what assets the municipality possesses, their condition, current day replacement cost, and impact if failed.

An Asset Management Plan plays a specific role in a municipality's practice of asset management, and is therefore organized in a fashion that answers five questions:

1. Asset Inventory - What are the assets, and where are they?
2. State of Infrastructure - What condition are the assets in?
3. Level of Service - What level of service do the assets deliver? Are there any level of service deficiencies?
4. Risk - What is the impact of these assets failing?
5. Financial – How much would the assets cost to replace?

## STRATEGIC ALIGNMENT

This Asset Management Plan utilizes information from the following documents:

- Asset Management Policy

- Asset Management Strategy
- 2018 Strategic Plan (Town of Sedgewick, 2018)
- 2020 Operating Budget (Town of Sedgewick, 2020)
- 2020 Capital Budget (Town of Sedgewick, 2020)
- Discovery Interview (interview of municipal staff performed by MuniSight)

## METHODOLOGY

### INTRODUCTION TO ASSET CLASSES

To simplify and summarize the results of the AMP, asset classes are used to group and aggregate asset information. In this report, the following asset classes are presented:

Road Network	-	Paved roads, gravel roads, street signs, sidewalks, etc.
Bridges & Culverts	-	Bridges, culverts, etc.
Water Network	-	Valves, water lines, water mains, etc.
Sanitary Sewer Network	-	Sanitary mains, valves, manholes, etc.
Storm Sewer Network	-	Storm mains, valves, manholes, etc.

### ASSET INVENTORY

A first step in gaining perspective on a municipality's asset management information is to understand what assets it owns and where those assets are located. A list of assets that a municipality maintains is typically referred to as an Asset Inventory (or Asset Register/Registry). Once the Asset Inventory is completed, common practice is to locate them in the field using surveyors, and then to reference the location of the listed assets in a GIS system.

Aside from identifying and locating assets it is important to collect specific attribute information such as defining characteristics (material of construction, date of construction, etc.) which can be used to infer remaining useful life and replacement costs.

### STATE OF INFRASTRUCTURE

As assets are utilized and exposed to the environmental elements, they deteriorate over time and need to be replaced. If an assets condition deteriorates enough, it will eventually be unable to provide its intended service (i.e. a washed-out road). For this reason, it is important to identify assets that are progressing towards failure, so they can be proactively replaced or maintained. Monitoring asset condition in a pro-active manner can lead to lower overall lifecycle costs as assets repairs can take place before further deterioration increases the overall cost. Asset repairs are often less disruptive to ratepayers, and are less costly to undertake, than a total replacement of a failed asset. Figure 1 is an example of a typical asset deterioration curve and associated incremental maintenance/replacement costs. Maintaining a database with current asset condition contributes to lower overall capital costs and asset down-time.

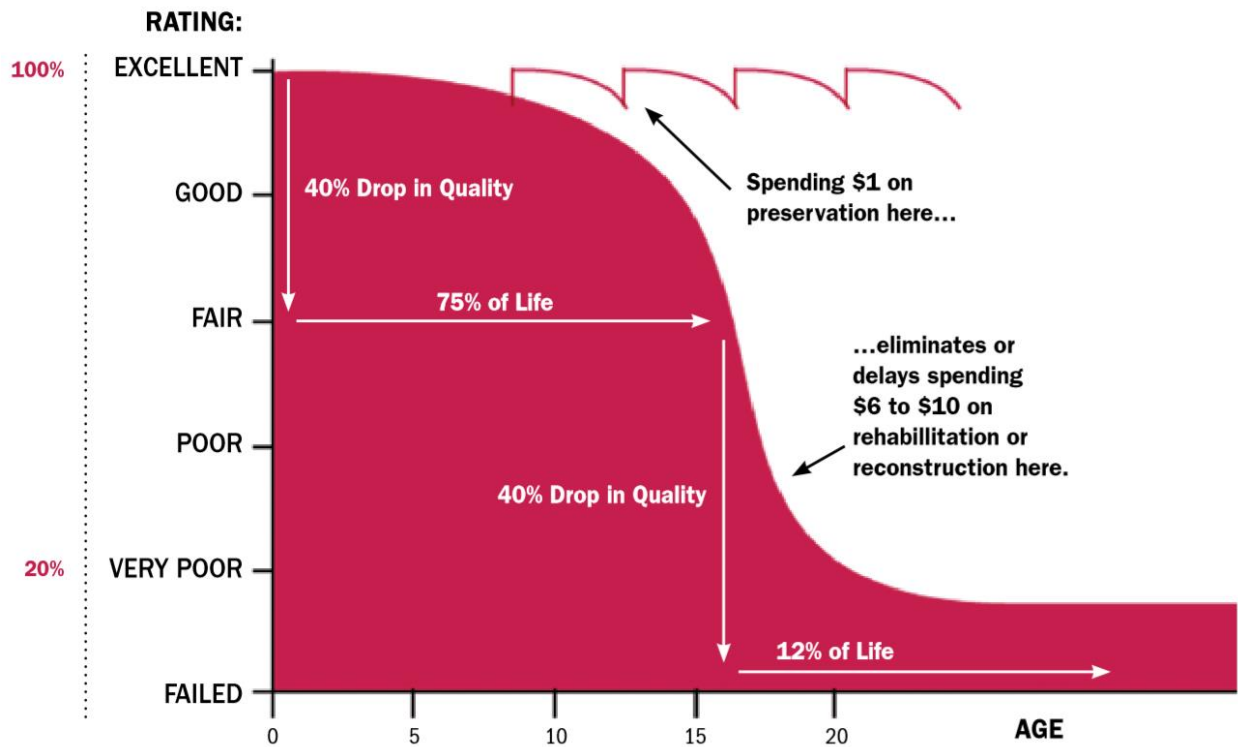


Figure 1: Example of Deterioration Curve From 2019 Canadian Infrastructure Report Card (ACEC, CCA, CPRA, CPWA, CSCE, CUTA, CNAM, FCM, 2019)

An asset Risk Assessment should be completed for any critical assets, assets that have failed or are close to failure. These Risk Assessments aim to measure the impact of asset failure, relative to the likelihood of the asset failing.

## LEVEL OF SERVICE

Assessing an asset's Level of Service (LOS) is a critical component of a sound Asset Management Plan, and is one of the three cornerstones of an Asset Management Plan, along with relative Condition Assessments, and asset Risk Assessments.

The goal of the LOS Assessment should be for a municipality to identify if an asset is delivering on its intended benefit. A good assessment of an asset's Level of Service lets a municipality know if an asset needs to be upgraded or modified, based on what the asset's users are expecting from the asset.

Understanding service means having a clear and consistent understanding of:

1. The types of services you provide;
2. The groups of residents, businesses, and institutions that you provide services to;
3. The level of service being delivered currently (your performance); and
4. The level of service you're aiming to provide (your target).

An asset's LOS is a measurement of its ability to deliver the desired benefits to the users of the asset. For example, a properly designed road must be able to transport enough vehicles to prevent traffic and inconvenience to

stakeholders, while also being in good enough condition to provide a comfortable ride. Broadly speaking, there are three different types of Level of Service:

- Technical - requirements dictated by the technical design requirements of the asset
- Legislated - requirements dictated by various levels of government (i.e. Federal/ State/ Provincial/ Municipal)
- Customer - requirements dictated by the stakeholder utilizing the asset

A proper LOS assessment will incorporate criteria from each of the three categories to ensure that an asset is meeting service performance.

A level of service deficiency is identified when the desired level of service does not match the actual level of service being produced by the asset. Part of Asset Management Planning is identifying these deficient assets so that they can be considered for upgrade, repair, or replacement.

To ensure proper LOS assessments, it is important to consider the following:

- Be consistent within asset type - make sure that each asset, within a specific type, is judged against the same LOS criteria
- Keep it simple - Make a LOS assessment fit for purpose, and do not over complicate it with a vague, or large, set of criteria
- Keep your customer in mind - Understanding the end customer who receives service from an asset is important when deciding which criteria to use when evaluating the Level of Service.

---

## RISK

An asset Risk Assessment helps municipal administrators understand if a failed asset possesses the potential to impact the municipality in a negative manner. Once the risks are known, a municipality can decide whether to invest in mitigating them.

Risk assessments are an assessment of potential events that could result in consequences associated with an asset. The risk score is a function of a consequence's impact and likelihood:

- Impact - what is the magnitude of a consequence's influence?
- Likelihood - what is the probability that this consequence will occur?

An assessment of asset risk depends on:

- Properly evaluating the potential events associated with an asset - what events could create unintended consequences? (e.g. an improperly maintained gravel road)
- Properly evaluating the potential consequences associated with an event - what consequences could arise as a result of events? (e.g. vehicle damage due to improperly maintained gravel roads)
- Properly assessing the impact and likelihood of a potential consequence.

A commonly used model to evaluate the different considerations of risk consequences is in the form of the PEARS model:

- People - what is the potential for a consequence to harm people?
- Environment - could this negatively impact the environment?
- Assets - what is the potential for municipal assets to be damaged?

- Reputation - what effect could this consequence have on our municipality's reputation at the local, provincial/state, and national level?
- Service - could this consequence negatively affect an assets' ability to deliver on the designed service?

When evaluating a potential consequence, it is important to consider whether the consequence could affect people, the environment, other assets, municipality's reputation, or the asset's ability to deliver service.

---

## FINANCIAL

Replacement cost is used to represent the current day value of a particular asset and is a representation of the full costs to replace the asset. This includes engineering, planning, materials, labour, administration costs, etc. Although it is a rough estimate of the true cost of replacing the asset, it is a good proxy to utilize when considering financial implications between asset investment options.

For the purpose of asset management planning, actual cost figures can be used, or costing algorithms can be developed and applied to an asset class to represent replacement value. Note that financial figures in an Asset Management Plan should not be used for operational budgeting purposes, as they are often too abstract.

---

## USING MUNISIGHT WEBMAP

The Town of Sedgewick is currently storing asset information in MuniSight's webmap application. This asset inventory can contain relevant asset information such as location, quantity, material, and length. The Summary section of this document includes the addition asset attributes that would be required to estimate the replacement costs if the Town of Sedgewick was utilizing MuniSight's AMP software. Town of Sedgewick currently does not have the AMP, which would allow for use of condition assessment, level of service assessment, risk assessment, and replacement cost software.

## LIMITATIONS AND ASSUMPTIONS

Although comprehensive, this Asset Management Plan does have limitations that must be highlighted, namely:

---

### FUTURE PREDICTIONS ARE BASED ON HISTORICAL INFORMATION

A fundamental assumption in this report is that the past is the best predictor of the future. The report uses historical information, such as replacement costs, to predict the future costs considering inflationary effects. Major economic, social, political, or environmental changes will degrade the relevance of historical information in predicting the future, thus rendering the findings of this report less accurate.

---

### A VIEW OF A POINT IN TIME

This report represents a snapshot in time. It is representative of the current state-of-affairs at the time of writing and will become dated with changes to municipal priorities and asset characteristics.

---

### CAPITAL EXPENDITURES

The Asset Management Plan only considers capital expenditures (CAPEX) when evaluating financial implications and does not consider operational expenses.

## DATA COMPLETENESS AND QUALITY

The Town of Sedgewick maintains a GIS software system to house most of its municipal asset information. The completeness and quality of the data was evaluated as part of this Asset Management Plan, where:

- Complete dataset: a dataset that includes 100% of the physical assets in the municipality’s jurisdiction.
- Quality dataset: a dataset that is error free and contains all the necessary information.

		Road Network	Culverts	Water Network	Sanitary Network	Storm Network
<b>Asset Inventory</b>	Complete	B	B	B	B	B
	Quality	B	C	B	B	C
<b>Asset Condition</b>	Complete	B	E	B	B	E
	Quality	C	E	C	C	E
<b>Level of Service</b>	Complete	E	E	E	E	E
	Quality	E	E	E	E	E
<b>Asset Risk</b>	Complete	E	E	E	E	E
	Quality	E	E	E	E	E
<b>Replacement Cost</b>	Complete	B	E	B	B	E
	Quality	C	E	C	C	E

Figure 2: Overall Data Quality and Completeness Chart

Striving for an A-grade in each category is a very long-term goal. Collecting asset information is a continuous process that involves time, money, and planning. A municipality will never have a fully complete inventory of their assets, due to the practical complexity of reaching such a goal. It is reasonable to expect that municipalities should focus on building accurate and complete inventories for their most valuable and critical assets first, followed by less important asset categories. In practice, this means prioritizing different classes of assets. For example, a municipality may decide that understanding road asset information is more important than traffic sign asset information, which would prompt them to focus on building a complete road network asset inventory before even beginning to build an inventory of traffic sign information.

After reviewing Figure 2, the Town of Sedgewick is not able to make asset management infrastructure investment decisions with its current asset information. It is the recommendation of this report to focus on centralizing Sedgewick’s asset management information and collecting asset information on the condition, level of service, risk, and replacement cost. A breakdown of the data collected can be found in the Asset Class Summary section below.



## ASSET CLASS SUMMARY

### ROADS

The Town of Sedgewick owns and manages a road network for transportation of people and goods throughout the municipality. Figure 3 is a summary of the road network inventory that is stored within the Webmap software:

Asset Name	(Units)	Count
Sidewalk	(km)	5.8
Curb/Gutter	(km)	44
Gravel	(km)	2
Paved	(km)	12
Total Road Length	(km)	14

Figure 3: Road Network Inventory

It is recommended that the Town of Sedgewick reviews and collects the designated road widths, as these are used as a primary factor in estimating replacement cost. While Sedgewick has a centralized database for storing asset information, the municipality does not have enough data on levels of service, asset condition, asset risk, and replacement cost to proceed forward with meaningful analysis of this information. Data quality metrics for the road network have been broken down in Figure 4 below.

Asset Name	Attribute	Data Completeness
Roads	Road Class	100%
	Road Width	0%
	Install Date	0%
	Expected Useful life	0%

Figure 4: Road Network Data Completeness

It is recommended that the municipality begin to collect additional information on the road network. This should start with finalizing the asset inventory, then progress to conducting condition and levels of service assessments for the road network assets that the municipality deems are the most critical. Refer to the “Getting Started: Toolkit Guide” (Municipal Affairs Alberta, 2015) for templates and suggestions for completing these assessments. The municipality has engineering firms periodically complete inspections on their road infrastructure, it is recommended that this data be standardized and stored within a centralized database for future asset management planning purposes.

### CULVERTS

The table below is a summary of the culverts inventory that is stored within the centralized database:

Asset Name	(Units)	Count
Culverts	(#)	11

Figure 5: Bridge and Culvert Inventory

Data quality metrics for the culvert inventory has been broken in Figure 6.

Asset Name	Attribute	Data Completeness
Culvert	Length	0%
	Diameter	100%
	Install Date	0%
	Expected Useful life	0%

Figure 6: Culvert Data Completeness

In order to estimate the replacement costs of these culverts, it is required that municipality collect the length of these culverts. It is also recommended to collect the install date and estimated useful life for these assets to develop an asset replacement forecast. Town of Sedgewick does not have enough data on levels of service, asset condition, asset risk, or asset replacement cost, to proceed forward with meaningful analysis of this information. It is recommended that the municipality begin to collect additional information on their culverts.

---

## WATER NETWORK

The Town of Sedgewick owns and maintains a water network to provide potable water to stakeholders. This network includes a water treatment plant and distribution infrastructure. The figure below is a summary of Sedgewick’s water network:

Asset Name	(Units)	Count
Water Main	(km)	13
Water Hydrant	(#)	44
Water Treatment Plant	(#)	1
Water Pump	(#)	1
Water Valve	(#)	484

Figure 7: Water Network Inventory

Approximately one third of the municipalities water and sanitary sewer network remain to be replaced, so it is suggested that the municipality focuses their initial asset management efforts in these areas. (Town of Sedgewick, 2018). It is recommended that the condition, level of service, and replacement costs for the water network be determined prior to any further detailed analysis. In order to develop an asset replacement forecast in the future, including replacement costs, it is recommended the Town of Sedgewick collects the remaining data in the data completeness figure below.

Asset Name	Attribute	Data Completeness
Water Main	Material	100%
	Diameter	100%
	Install Date	0%
	Expected Useful Life	0%
Water Hydrant	Install Date	0%
	Expected Useful Life	0%
Water Treatment Plant	Replacement Cost	0%
	Install Date	0%
	Expected Useful Life	0%
Water Pump	Replacement Cost	0%
	Install Date	0%
	Expected Useful Life	0%
Water Valve	Diameter	29%
	Install Date	0%
	Expected Useful Life	0%

Figure 8: Water Network Data Completeness

It is recommended for the municipality to determine the installation date and expected useful life for all the water network assets in order to develop an asset replacement forecast. The municipality does not have enough data on levels of service, asset condition, asset risk, or asset replacement cost to proceed forward with meaningful analysis of this information. The municipality has engineering firms periodically complete inspections on their water network infrastructure, it is recommended that this data be standardized and stored within a centralized database for future asset management planning purposes.

---

#### SANITARY SEWER NETWORK

Town of Sedgewick owns, operates, and maintains a sanitary sewer collection system to provide wastewater removal for stakeholders of the municipality. As mentioned in the previous section, about one third of the sanitary sewer network remains to be replaced. The table below is a high level summary of the Town of Sedgewick's sanitary network within MuniSight's Webmap:

Asset Name	(Units)	Count
Sanitary Sewer Main	(km)	15
Sanitary Manhole	(#)	124
Sanitary Pump	(#)	2

Figure 9: Sanitary Network Inventory

The Town of Sedgewick manages a sanitary sewer network. Relevant data quality metrics for this asset category have been broken down in the table below.

Asset Name	Attribute	Date Completeness
Sanitary Main	Material	53%
	Diameter	100%
	Install Date	0%
	Expected Useful Life	0%
Sanitary Manhole	Install Date	0%
	Expected Useful Life	0%
Sanitary Pump	Install Date	0%
	Expected Useful Life	0%
	Replacement Cost	0%

Figure 10: Sanitary Network Data Completeness

The municipality does not have enough data on levels of service, asset condition, asset risk, or asset replacement cost to proceed forward with meaningful analysis of this information. It is recommended that the municipality begin to collect additional information on their sanitary network. The municipality has engineering firms periodically complete inspections on their sanitary network infrastructure, it is recommended that this data be standardized and stored within a centralized database for future asset management planning purposes.

---

## STORM SEWER NETWORK

The table below is a summary of the Town of Sedgewick’s storm sewer network:

Asset Name	(Units)	Count
Storm Sewer Main	(km)	4
Storm Sewer Manhole	(#)	36
Storm Sewer Discharge	(#)	9

Figure 11: Storm Sewer Inventory

Data quality metrics for this asset category have been broken down in Figure 12.

Asset Name	Attribute	Date Completeness
Storm Sewer Main	Material	95%
	Diameter	96%
	Install Date	0%
	Expected Useful Life	0%
Storm Sewer Manhole	Install Date	0%
	Expected Useful Life	0%
Storm Sewer Discharge	Diameter	100%
	Install Date	0%
	Expected Useful Life	0%

Figure 12: Storm Sewer Data Completeness

In order to complete the asset inventory, it is recommended that the municipality determine install date and estimated useful life for each of the assets above in order to develop asset replacement forecasts. It is also suggested that the municipality review current data to ensure that all the asset locations have been captured in this inventory. The municipality does not currently have enough data on levels of service, asset condition, asset risk, or asset replacement cost to proceed forward with meaningful analysis of this information. It is recommended that the municipality begin to collect additional information on their storm sewer network.

## CONCLUSION

The Town of Sedgewick is at the early stages of developing an integrated and robust asset management process. The municipality has been investing in infrastructure renewal through engineering reports and projects. This is a significant step towards understanding the need for asset reinvestment to maintain long-term service delivery.

The Town of Sedgewick maintains a basic list of asset information for many of their infrastructure assets. It is recommended that the asset conditions, levels of service, risk, and replacement cost information for these infrastructure assets are collected and stored within a centralized asset database. This database typically comes in the form of an excel spreadsheet or asset management software. Centralizing this data is an important step in understanding the overall state of infrastructure assets throughout the municipality. As municipal staffing is generally stretched thin, it is recommended to utilize a gradual and stepped approach to improvement in these area's rather than trying to address all these information gaps at once. This report suggests that the Town of Sedgewick focuses data collection efforts on one portion of the overall asset network. Which portion to begin with is typically deemed as the asset network which requires the most urgent attention or where the state of infrastructure is largely unknown. The strategic plan mentions that one third of the water and sanitary main network need replacement. It was also mentioned by interviewed staff that the curbs, roads, and sidewalks need replacement as well. Both areas are a potential next step for data collection.

Next steps for the Town of Sedgewick include data collection, asset management document consolidation, and additional asset management training for staff. Developing an effective asset management program is a continuous process, which may evolve or change over time. It is reasonable to expect that data collection, defining levels over service, etc. will take place gradually, over a long time period.

**RECOMMENDATIONS**

The following recommendations are provided, based on the findings in this Asset Management Plan:

#	Priority	Recommendation	Accountable
1		Formalize Asset Management Documentation – adopt draft asset management Policy, Strategy, & Plan.	Council
2		Data Management - Continue to update and sort asset information into centralized database.	
3		Asset Data – Develop a schedule for completing the asset inventory then begin condition assessment collection. Start with a specific asset type that the municipality deems most critical. For example, <ol style="list-style-type: none"> <li>1. Collect water network condition (potentially bringing engineering data into centralized database)</li> <li>2. Collect sanitary network condition (potentially bringing engineering data into centralized database)</li> <li>3. Collect road network condition</li> <li>4. Etc.</li> </ol>	
4		Levels of Service - Define Levels of Service for each asset type. This will benefit from input from Council and Stakeholder’s throughout the municipality.	
5		Training – Investigate Training options for municipal staff on Asset Management fundamental principles.	
6		Determine installation date, expected useful life, and replacement costs for infrastructure assets in order to develop an asset replacement forecast.	
7		Asset Data – Conduct Levels of Service assessment and Risk assessment, beginning with higher priority assets.	

Figure 13: Report Recommendations

## REFERENCES

ACEC, CCA, CPRA, CPWA, CSCE, CUTA, CNAM, FCM. (2019). *2019 Canadian Infrastructure Report Card*. Retrieved from Canadian Infrastructure: <http://canadianinfrastructure.ca/downloads/canadian-infrastructure-report-card-2019.pdf>

Municipal Affairs Alberta. (2015, 01 01). *Getting started : toolkit user guide. Quick start tools and templates for building an asset management program*. Retrieved from Alberta Government Publications: <https://open.alberta.ca/publications/getting-started-toolkit-user-guide-for-building-an-asset-management-program#detailed>

Town of Sedgewick. (2018). *Strategic Plan*.

Town of Sedgewick. (2020, May). *2020 Capital Budget*. Retrieved from Town of Sedgewick: [https://sedgewick.ca/wp-content/uploads/2020/05/2020-Capital-Budget\\_web.pdf](https://sedgewick.ca/wp-content/uploads/2020/05/2020-Capital-Budget_web.pdf)

Town of Sedgewick. (2020, May). *2020 Operating Budget*. Retrieved from Town of Sedgewick: [https://sedgewick.ca/wp-content/uploads/2020/05/2020-Operating-Budget\\_web.pdf](https://sedgewick.ca/wp-content/uploads/2020/05/2020-Operating-Budget_web.pdf)