# FINAL REPORT

# Asset Management Investment Plan
# Version 1

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## 1.0 Executive Summary

The Village of Lions Bay (Lions Bay) owns and maintains a large portfolio of infrastructure upon which it greatly relies for delivering services to the community.

Some of the assets, such as the water system, date back to the 1960's. These assets, and others, have served the community well; however, many of these assets are nearing the end of their useful lifespans and will eventually need to be replaced or rehabilitated.

The Asset Management Investment Plan (AMIP) aims to establish the best practices for asset management by answering the following questions:

1) *How much are our assets worth?*
2) *How much remaining life do our assets have?*
3) *How much value of our assets is consumed?*
4) *What is our infrastructure deficit?*
5) *What are our life cycle costs?*
6) *When do our assets need to be replaced?*

By understanding the answers to these questions, the community will be able to budget and plan for the replacement of their infrastructure. Failure to plan would put the community at risk of service disruptions, decreased level of service, emergency repairs and sudden and significant tax and user fee increases. By being proactive today, the Community can ensure that services are sustainable so that current and future generations can enjoy the same levels of service with reasonable tax rates and user fees. The assets included in this study area are Water, Sewer, Drainage, Buildings, Transportation, Land Improvements (Parks) & Fleet & Equipment.

In summary, the total value of assets included in this study is $44.2 million. On average, these assets have 43% remaining life, which means they are more than halfway through their lifespan and approximately 11% of the community's assets has passed its expected lifespan (a.k.a. deficit). In order to ensure these assets can continue to provide service, decisionmakers must determine the appropriate funding target for asset replacement.

**What is Asset Management?**

The process of bringing together the skills and activities of people; with information about the community's physical infrastructure assets and financial resources to ensure long term sustainable service delivery.

Sound asset management practices support sustainable service delivery by considering community priorities, informed by an understanding of the trade-offs between the available resources, risk and the desired services.

Sustainable service delivery ensures that current community services are delivered in a social, economic, and environmentally responsible manner that does not compromise the ability of future generations to meet their own needs.


***Figure 1-1.1 Asset Management Framework***

Table 1.1. Below summarizes several key infrastructure metrics that can be used to help the community understand the state of their infrastructure

Table 1.1.1 Asset Management Investment Plan V1.0 Results

| Description | Replacement Cost | Infrastructure Deficit | Remaining Life | Asset Consumption | Life Cycle (IBP) |
|---|---|---|---|---|---|
| **General Capital** | **$20.2M** | **12%** | **44%** | **$11.3M** | **$640K** |
| Equipment | $2.4M | 28% | 31% | $1.7M | $230K |
| Land Improvement | $360K | 0% | 49% | $190K | $15K |
| Transportation | $12.2M | 12% | 44% | $6.8M | $270K |
| Building | $4.9M | 0% | 53% | $2.3M | $115K |
| Drainage | $310K | 50% | 17% | $260K | $10K |
| **Sewer Capital** | **$2.5M** | **4%** | **19%** | **$2.0M** | **$70K** |
| **Water Capital** | **$21.5M** | **11%** | **44%** | **$12.1M** | **$495K** |
| **Total** | **$44.2M** | **11%** | **43%** | **$25.4M** | **$1.2M** |

*Refer to Terms and Definitions of replacement cost, infrastructure deficit, % remaining life, value consumed, Life Cycle

Each of the metrics above (replacement cost, remaining life percentage, consumption, deficit, life cycle) provides key insights into the state of the community's infrastructure and can be used to assist with setting long-term funding targets for asset replacement. Setting an appropriate long-term funding target is critical to the future health of the community's infrastructure and directly affects the level of service, risk and fees paid by its stakeholders. In order to assist the community with setting the long-term funding targets for asset replacement, the life cycle funding target was calculated. The life cycle funding target represents the average annual investment required to replace assets at the end of their life span. It was determined that there is a funding gap between the life cycle funding target ($1.2 million) and the current funds available for capital works (approximately $300,000). This gap could provide insights that over the long-term, Lions Bay may not be investing enough to sustain assets at the current level of service. In fact, if 100% of the available $300,000 was invested into replacement, the deficit would increase from 11% to 56% over the next 30 years, which could result in a reduced level of service and increased risk.

As a next step, the community should consider refining the life cycle funding target based on risk, level of service, and develop a revenue strategy to meet that target. This will provide Lions Bay with the confidence that future generations can enjoy the same levels of service as well as reasonable tax rates and user fees. Also, consideration should be given to developing an annual reporting template that would assist with communicating and understanding the infrastructure metrics provided in this report. This would provide staff with a standardized way to present this information annually to councils, staff and citizens and serve as a common document to discuss the future of Lions Bay community infrastructure.

## TERMS AND DEFINITIONS

### ASSET

A physical component of a system that has value, enables services to be provided, and has an economic life greater than 1 year.

### FUNDS AVAILABLE FOR CAPITAL (A.K.A Transfers to Reserves)

Represents the total annual funds that are available for capital projects after all operation and maintenance expenditures are paid (a.k.a. transfers to reserves).

### REPLACEMENT COST

The cost required to replace all assets in current dollars, based on a like-for-like replacement.

### INFRASTRUCTURE DEFICIT

Infrastructure deficit is a measure of the amount of infrastructure that has passed its theoretical service life, but still provides service to the community. This is typically represented as a percentage of the total infrastructure replacement value:

$$\frac{\textbf{Infrastructure Deficit}}{\textbf{Replacement Cost}}$$

### REMAINING LIFE PERCENTAGE

Remaining life is an estimate of the percentage of life left in an asset before it needs to be theoretically replaced and can be used as a proxy for condition. The remaining life percentage is calculated by taking the number of remaining years before replacement and dividing it by its estimated service life.

### ASSET CONSUMPTION

Asset consumption is a measure of the financial value of the asset that has been consumed to date.

***Example:***

*Asset Value: $10*

*Service Life: 10 Years*

*Life Cycle (Amortization): $1/yr*

*Age: 5 Years Old*

*Asset Consumption: 5 Years old x Life Cycle ($1) = $5*

### LIFE CYCLE

Represents the average annual life cycle investment required to sustain the assets over the long term, based on service life estimates that were derived from Industry Best Practice (IBP) documentation. These service life estimates are typically conservative and often lead to unrealistic funding targets. The formula used to calculate the Life Cycle is:

$$\sum \frac{\textbf{Replacement Cost}}{\textbf{Industry Best Practice}}$$

## LEVEL OF SERVICE

A measure of the quality and reliability of a service from the perspective of residents, businesses, and customers in the community.

## REVENUE

The income received from taxes, user fees, government transfers and other sources.

## RISK(S)

Events or occurrences that will have an undesired impact on services (Risk = Consequence of Failure x Likelihood of Failure).

## CONSEQUENCE OF FAILURE (COF)

A measure of the impact that an asset failure would have relative to other assets. Typically, Consequence of Failure (COF) considers triple-bottom-line thinking, which considers the environmental, social and financial aspects.

## LIKELIHOOD OF FAILURE (LOF)

A measure of the probability of an asset failure relative to other assets. Typically, Likelihood of Failure (LOF) considers rating it on a three-level system.

## SERVICE LIFE INDUSTRY BEST PRACTICE (IBP)

The length of time an asset will last before it requires replacement or rehabilitation, based on published industry standards.

## TOTAL ADJUSTABLE REVENUE

The revenue currently collected through taxation or user fees that could be directed towards capital asset replacement.

## 2.0 What is Asset Management?

Asset management is a continual improvement process that focuses on bringing together the skills and activities of people, combined with information about assets and finances, to enable long-term sustainable service delivery. Sustainable service delivery ensures that current community services are delivered in a socially, economically, and environmentally responsible manner that does not compromise the ability of future generations to meet their own needs. Sound asset management practices support sustainable service delivery by considering community priorities and understanding the trade-offs between the available resources, risks and desired service levels. In order to help guide communities through their asset management journeys, the Ministry of Community Sport and Health, UBCM and Asset Management BC—with consulting help from Urban Systems—, developed the "Asset Management for Sustainable Service Delivery Framework."

It is important to note there is no right spot to start on the framework; rather, it is up to each community to determine their specific asset management needs and build their program based on their individual priorities.


***Figure 2-1 Asset Management for Sustainable Service Delivery, ABC Framework***

### 2.1 Why Is Asset Management Important?

Communities across Canada are currently faced with infrastructure and organizational challenges. Many are realizing that most of their infrastructure was installed decades ago and has continually provided service to the community with little-to-no service disruption. These assets, which have provided significant value to the community, are now nearing the end of their service life; however, many local governments have not fully planned for their replacement.

With increasing cost pressures and unsustainable funding approaches, communities are beginning to realize they need to change the way they think about managing their assets, recovering revenues, and delivering services. Communities are now embracing the need to integrate asset management principles and thinking about their organization with the following goals in mind:

- Be financially sustainable over the long term.
- Reduce the need to place a large financial burden on future generations.
- Increase the likelihood that user fees and property taxes are stable and consistent to reduce the need of large 'one-off' fee increases.
- Increase the likelihood that service levels can be maintained over the long term.

With this understanding, Lions Bay invested in improving their understanding of long-term costs associated with asset replacement through the development their Asset Management Investment Plan Version 1 (AMIP V1).

## 2.2 Background

Lions Bay strives to be a sustainable and resilient community with a diverse and affordable infrastructure base to deliver services for its residents. The key to sustainably delivering services lies in how a community invests in its infrastructure. Lions Bay first completed a financial report in 2008 that provided information on its tangible capital assets, or "TCA." The "TCA" exercise was backward looking, in that it used historical costs to calculate the Life Cycle costs required to replace infrastructure (also known as amortization). Although this exercise was helpful, the community understands the need to move towards a forward-looking approach, which will focus on setting long-term funding targets based on replacement costs rather than historical costs. With this in mind, the community invested in developing their Asset Management Investment Plan Version 1 (AMIP V1). The following sections summarize the approach used to develop this plan.

### Step 1: Establish Inventory

The inventory is the foundation of the AMIP in that it represents the information that directly informs the outputs of the AMIP. It has been found, through working with numerous communities across Canada, that having perfect information is not the best strategy to get a community's AMIP off the ground. Taking a bottom-up approach to the inventory results in costly factfinding exercises and doesn't necessarily have a large impact on the outcomes of the project. Keeping this in mind, the focus of the inventory establishment was based on compiling readily available information and transforming it into a format that supports asset management and that could be repeated on an annual basis.

Urban Systems worked directly with staff to develop the asset inventory which included; compiling and adding attributes to GIS records, adding attributes to the TCA reporting inventory and compiling information from existing reports. All the information was compiled into a central inventory that was used to inform the AMIP V1. A summary of the inventory sources can be found in **Appendix A**.

It is recommended that a community improves its inventory information regularly, replacing old inventory as needed and updating the AMIP results. This will help ensure that the community can track progress over time

### Step 2: Update Replacement Costs

The 2018 replacement costs were developed using a combination of the 2017 statement of values, current unit costs and indexing historical costs to current costs using the ENR cost index. A summary of the replacement costs sources can be found in **Appendix A**.

### Step 3: Service Lives

Majority of the service life estimates were assigned based on industry best practices from the Tangible Capital Asset (TCA) report and where possible condition-based service lives were utilized. It is important to note that industry best practice service lives are not community-specific; they are identical across communities and often considered to be conservative estimations. Over time, it is important to refine the industry best practice service life estimates to community-specific lifespans which are grounded in local understanding of infrastructure and condition. A summary of service life sources can be found in **Appendix A**.

### Step 4: Develop Asset Investment Management Plan Version 1 (AMIP V1)

The last step of this process was to integrate the inventory, replacement costs and the service lives into the AMIP model. The results and findings from the model are detailed below in Section 3.0.

## 3.0 Asset Management Investment Plan V1.0

The Asset Management Investment Plan (AMIP) is an asset replacement forecast that can be used to inform long-term funding decisions for each of the major asset categories. The AMIP is developed based on like-for-like replacement and does not consider any demand for new infrastructure. Adequate asset replacement funding will ensure services can be reliably provided into the future.

The AMIP is designed to answer the following best practice asset management questions:

1) *How much are our assets worth?*
2) *How much remaining life do our assets have?*
3) *How much value of our assets is consumed?*
4) *What is our deficit?*
5) *How what are our life cycle costs?*
6) *When do our assets need to be replaced?*

| | |
|---|---|
| ***An Asset Management Investment Plan can:*** | » Build awareness with staff, council and the community on the magnitude and timing of potential infrastructure investments;<br>» Identify revenue requirements over the long term;<br>» Assist with setting rates and taxes and;<br>» Inform the urgency of investments. |
| ***Asset Management Investment Plan is not:*** | » A capital plan that sets out specific projects for the community to undertake;<br>» An infrastructure cost tool that can be used for construction tenders and provides accurate project costing; or<br>» A complete asset management program. |

Each of the best practice asset management questions are further explained in the following sections.

### 3.1 How Much Are Our Assets Worth?

Knowing the replacement value of a community's assets provides an organization with a deeper understanding of the magnitude of infrastructure that it is responsible for managing and replacing. These cost figures directly affect the Life Cycle and are a driver for future revenue requirements. Asset replacement costs are in current dollars, are based on like-for-like replacement and do not consider new infrastructure required to satisfy regulatory requirements, growth, safety improvements, or economic development.

## 3.2 How Much Remaining Life Do Our Assets Have?

Remaining life percentage provides an estimate of the amount of life left in an asset before it needs to be theoretically replaced. The remaining life is calculated by taking the number of remaining years before replacement and dividing it by its estimated service life.

***Example:***

*# of Remaining years before replacement: 50 years*

*Estimated Service Life: 100 Years*

*% Remaining life: 50/100 = 50% (approx. half way through the assets life)*

Asset remaining life is one indicator that can be used to understand the condition of an asset and can be used to inform replacement and inspection programs.

## 3.3 How Much Value of Our Asset Is Consumed?

Asset consumption is a measure of the financial value of the asset that has been consumed to date.

***Example:***

*Asset Value: $10*

*Service Life: 10 Years*

*Life Cycle (Amortization): $1/yr*

*Age: 5 Years Old*

*Asset Consumption: 5 Years old x Life Cycle ($1) = $5*

Asset consumption gives an idea of how much funding would need to be set aside if the community chooses to replace the asset at the end of its estimated service life on a ‘pay as you go’ basis. For the example above, the community would need $5 in a reserve today and would need to continue to place one dollar per year for the next five years in a reserve in order to replace the asset with cash on its estimated expiration date. Although it is not always feasible to fund all assets on a ‘pay as you go’ basis and replace every asset at the end of its estimated service life, this parameter can help guide discussions when considering the organizations willingness to take on risk and can be used to guide reserve contribution discussions.

## 3.4 What Is Our Deficit?

The infrastructure deficit is a measure of the infrastructure value that has passed its estimated service life but still provides a service to the community. The infrastructure deficit can be presented as a dollar value or as a percentage of the total infrastructure value.

***Example:***

*Infrastructure Deficit (Expressed as a dollar value): $10*

*Infrastructure Deficit (expressed as a % of total value) = Infrastructure Deficit ($10) / Replacement Cost ($50) = 20%*

It's important to note that an infrastructure deficit to a certain point is healthy, as it provides insights that assets are lasting longer than estimated. This could be resulting from good maintenance practices or estimated service lives being too conservative. It is recommended that assets within a deficit be inspected to determine if replacement is required or if the service life can be further extended.

## 3.5 What Are Our Life Cycle Costs?

Estimating and setting long-term funding targets for asset replacement is critical to the health of a community's infrastructure and directly affects the future level of service, risk and fees paid by its stakeholders. In order to assist the community with setting these targets, the life cycle funding target was calculated. The life cycle funding target represents the average annual investment required to replace assets at the end of their life span with cash. Although it is not often possible for the community to meet the life cycle funding target, this measure provides a great starting point to understand the stretch funding target and forms a basis for its refinement. Over time, the community should work on refining the life cycle funding target based on risk, level of service, willingness of customers to pay and the financial capacity of the organization to meet that target.

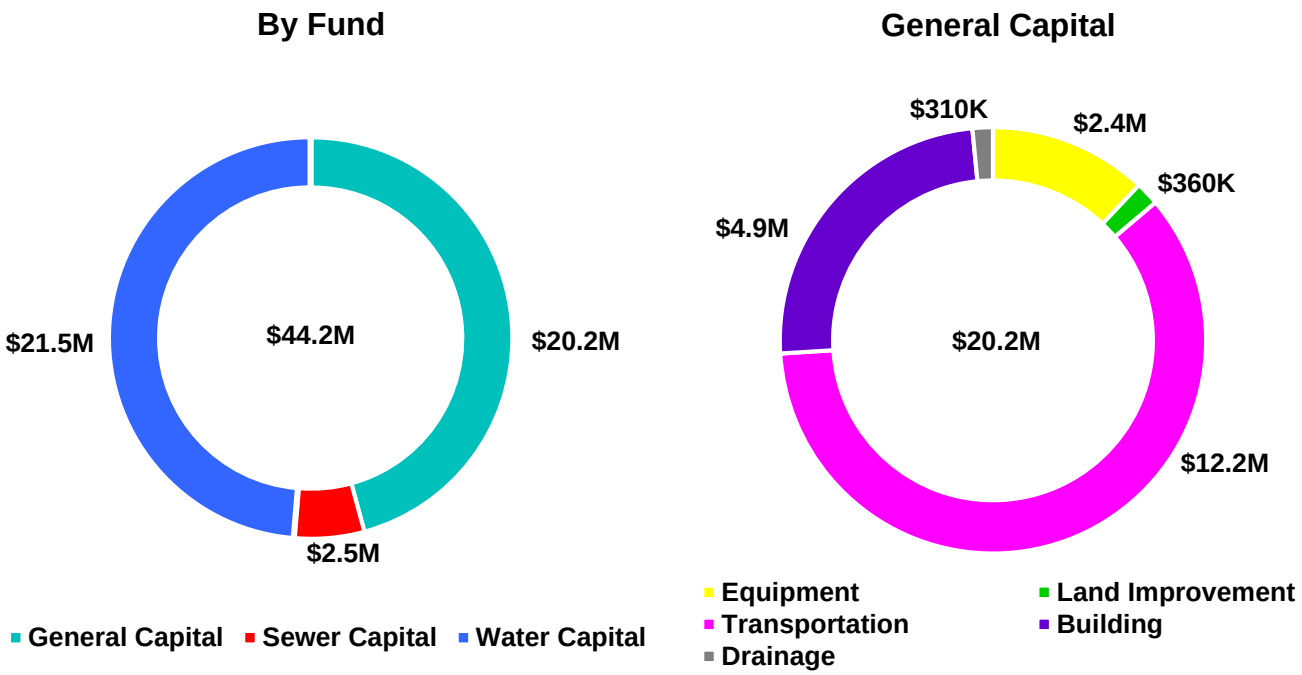
## 3.6 When Do Our Assets Need To Be Replaced?

Understanding the general timing of when assets need to be replaced is important when financially preparing for the future. The replacement schedule can provide insights into the magnitude of investment required in the short, medium and long term, which can inform the urgency of investment. It is important to note that the replacement schedule is not a capital plan but rather shows the general timing of individual assets. Grouping individual asset replacements into a consolidated project and performing a condition assessment is the recommended practice for determining capital project priorities.

## 4.0 The Results

The inventory, replacement costs and service life data were directly input into the AMIP model to answer the asset management best practice questions.

### 4.1 How Much Are Our Assets Worth?




**M:** Million

Figure 4-1 How Much Are Our Assets Worth?

**Observations:**

- *General Capital represents 46% of the replacement value*
- *Sewer Capital represents 5% of the replacement value*
- *Water Capital represents 49% of the replacement value*
- *Within General Capital; Transportation and Buildings represent, 85% of the replacement value*

## 4.2 How Much Remaining Life Do Our Assets Have?

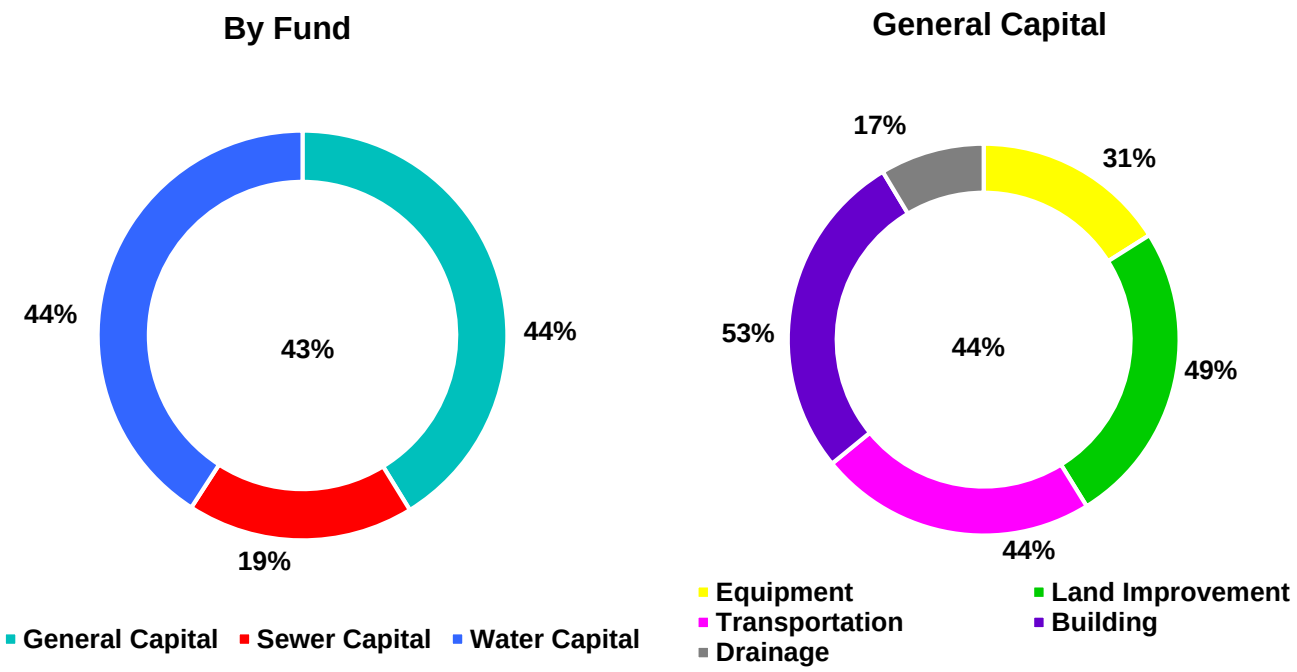



Figure 4-2 How Much Remaining Life Do Our Assets Have?

**Observations:**

- *On Average, assets are more than halfway through their estimated life span (43% remaining life)*
- *General & Water Capital assets on average are more than halfway through their estimated life span (44% remaining life)*
- *Drainage and Sewer assets have the lowest remaining life (17% & 19%, respectively)*
- *Within General Capital; drainage and equipment assets have the lowest remaining life (17% & 31%, respectively)*
- *Within General Capital, building and transportation assets have the highest remaining life (53% & 44%, respectively)*

## 4.3 How Much Value of Our Asset Is Consumed?

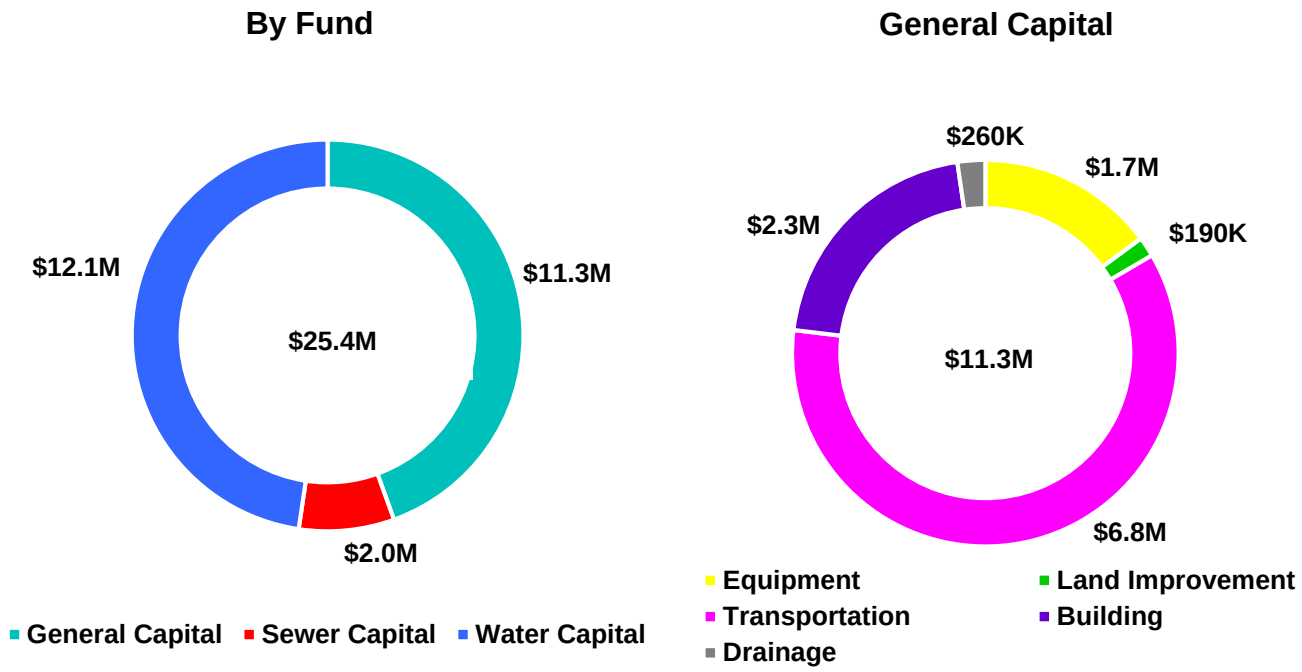



Figure 4-3 How Much Value of Our Asset Is Consumed?

**Observations:**

- *More than half the asset value is consumed (57% or $25.4M)*
- *Water and Transportation assets represent 74% ($19M) of the consumed value for all assets*
- *Within General Capital; Buildings and transportation assets represent 80% ($9M) of the consumed value*

## 4.4 What Is Our Deficit?

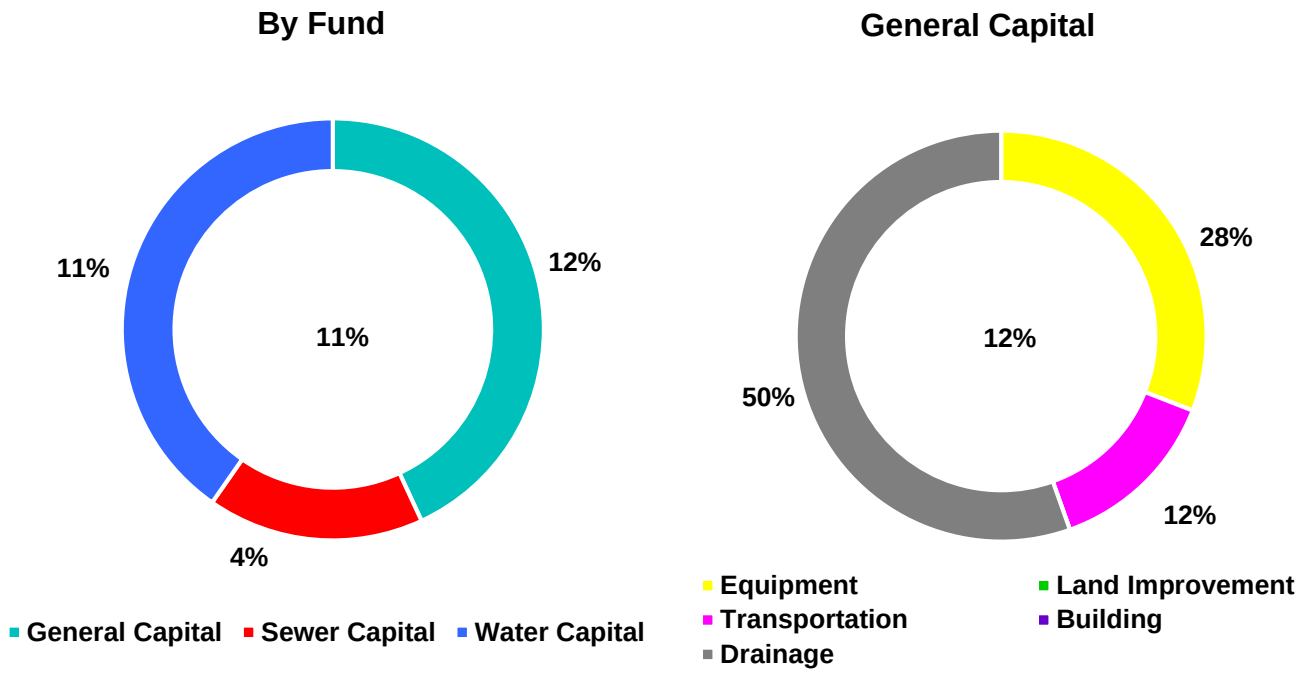



Figure 4-4 What Is Our Deficit?

**Observations:**

- *11% of the assets are past their estimated service life (i.e. are within a deficit).*
- *12% of the General Capital assets have passed their estimated service life (i.e. are within a deficit).*
- *Within General Capital; drainage & equipment assets have the largest deficits (50% & 28%, respectively)*
- *Land Improvements (Parks) & Building assets have no deficit (0%)*

## 4.5 What Are Our Life Cycle Costs?

Table 4.1 How Much Do We Need to Invest to Sustain Our Assets?

| Funding Summary | |
|---|---|
| **Description** | **Life Cycle ($/yr) (IBP)** |
| **General Capital** | **$640K** |
| Equipment | $230K |
| Land Improvement | $15K |
| Transportation | $270K |
| Building | $115K |
| Drainage | $10K |
| **Sewer Capital** | **$70K** |
| **Water Capital** | **$495K** |
| **Total** | **$1.2M** |

**Note**: Does not consider communities' willingness to pay, decreases to level of service & financing ability (debt, reserves, grants etc...)

**Observations:**

- *53% of the life cycle funding costs are represented by General Capital*
- *6% of the life cycle funding costs are represented by Sewer Capital*
- *41% of the life cycle funding costs are represented by Water Capital*
- *Within General Capital; 79% of the life cycle funding costs are represented by equipment and transportation assets*

## 4.6 When Do Our Assets Need to Be Replaced?

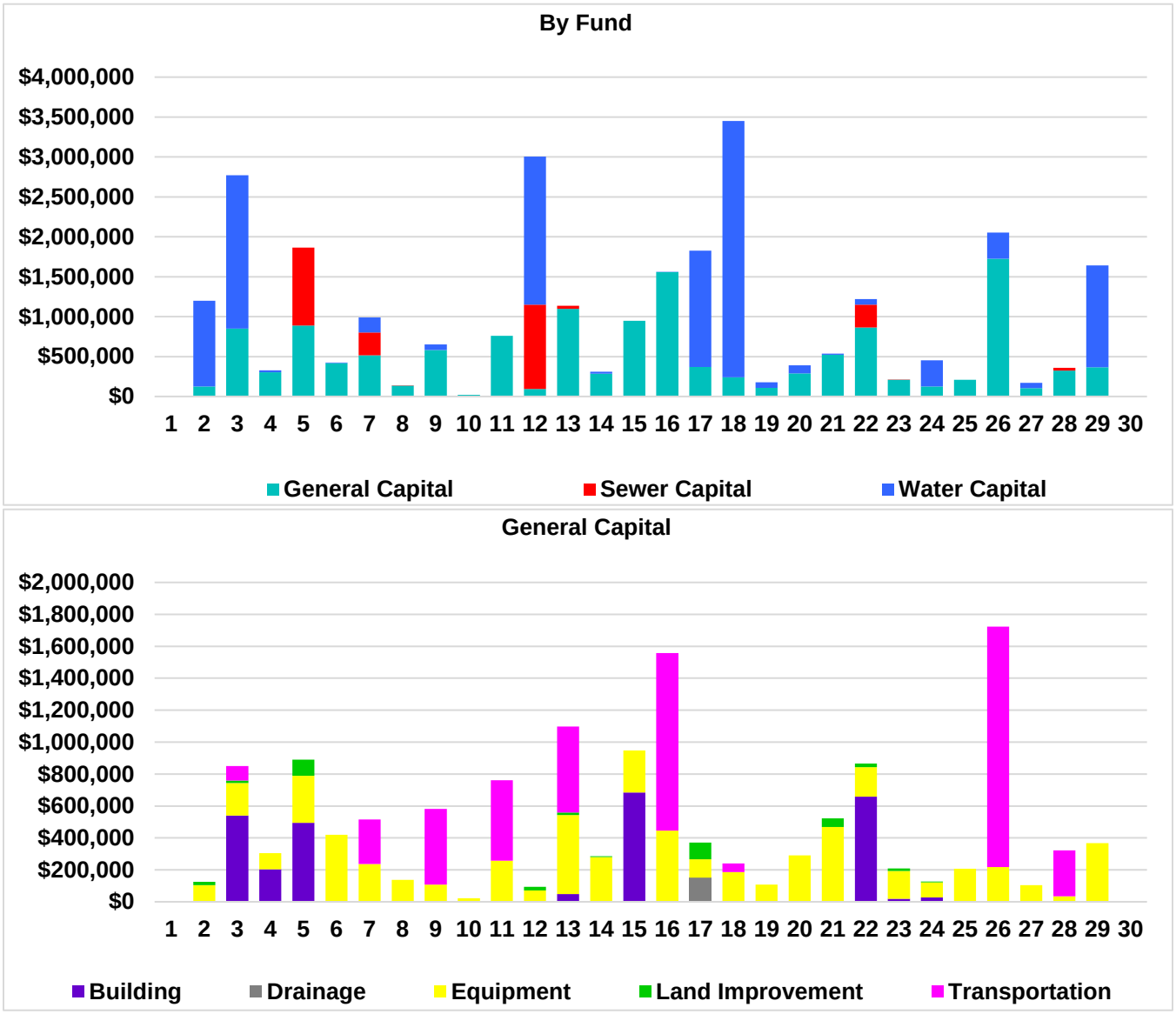



Figure 4-5 When Do Our Assets Need To Be Replaced***?***

**Observations:**

- *Overall, asset replacement expenditures are increasing over time*
- *49% of the total 30 year asset replacement expenditures are represented by General Capital*
- *9% of the total 30 year asset replacement expenditures are represented by Sewer Capital*
- *42% of the total 30 year asset replacement expenditures are represented by Water Capital*

  *Within General Capital; 77% of the total 30 year replacement expenditures are represented by equipment and transportation assets.*

## 5.0 What Is our Life Cycle Funding Gap?

The life cycle funding gap is the difference between the life cycle funding target and the current capital available for asset replacement. The life cycle funding target represents the average annual investment required to replace the assets at the end of their estimated lifespan, and the current capital available for asset replacement is an approximation of the total annual funds that are available for capital projects after all operation and maintenance expenditures are paid (A.K.A. transfers to reserves). Its important to note that the available capital for replacement can change annually based on new operation expenses (such as hiring new employees). ***Figure 5-1*** below illustrates the life cycle funding gap for each fund

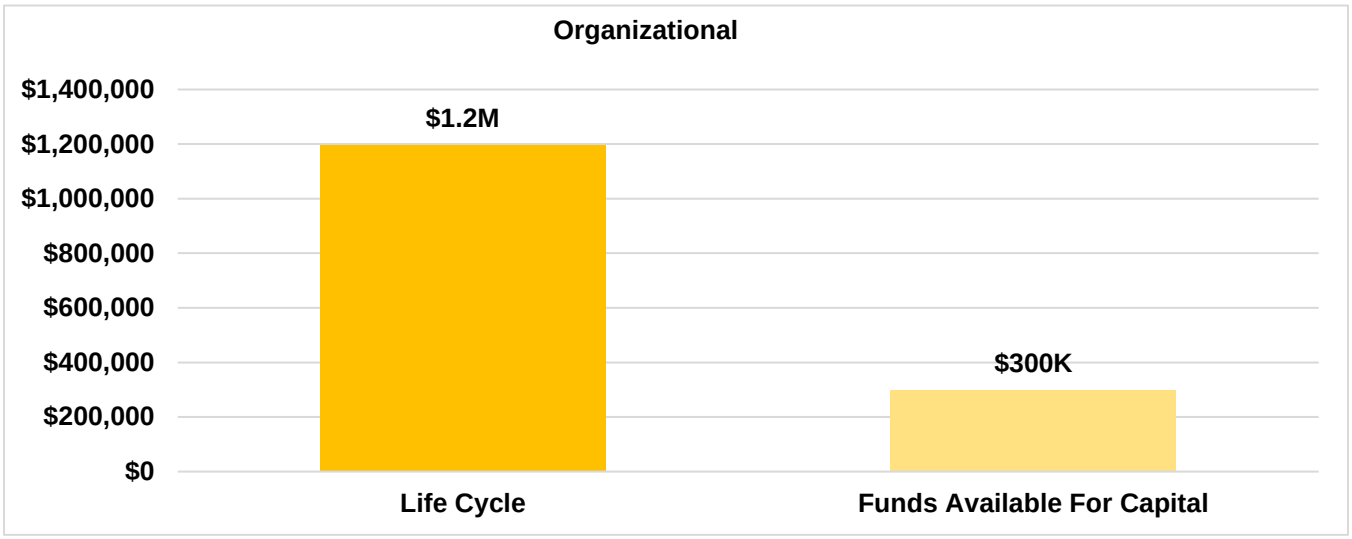



*Figure 5-1 Life Cycle Funding Gap*

**Observations:**

- Life Cycle funding target for the organization (all asset categories) is $1.2 million
- The funds available for capital for the organization (all asset categories) is $300,000
- Funding gap between the life cycle funding target and the funds available for capital is $900,000
- The gap between the life cycle funding target and the funds available for capital provides insights that Lions Bay may not be able to sustain the same level of service over the long-term.

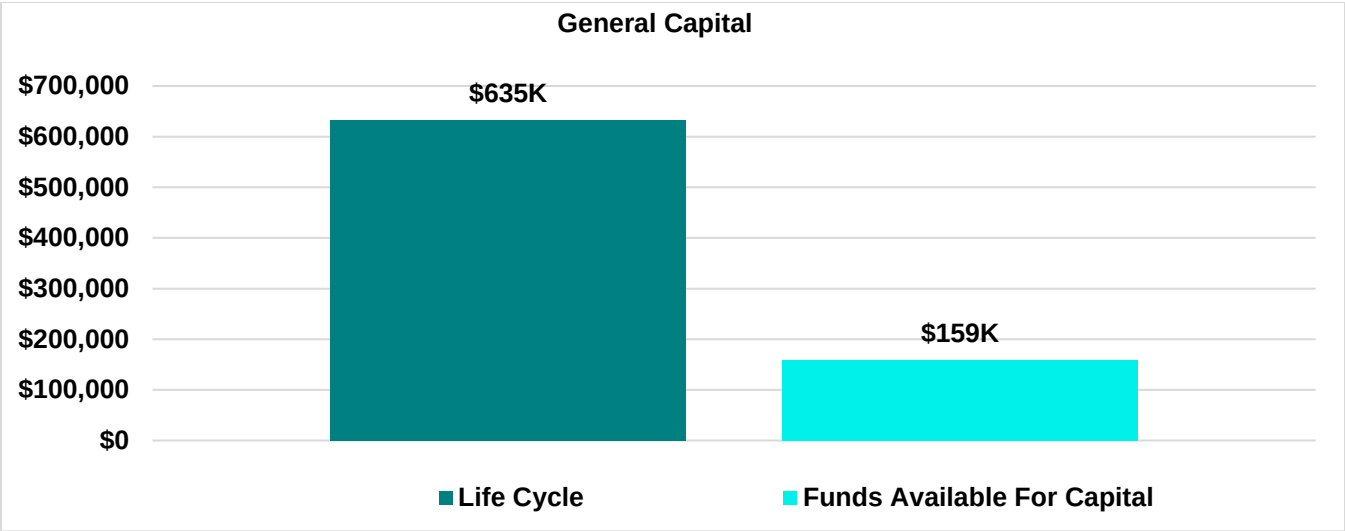



*Figure 5-2 General Capital Life Cycle Funding Gap*

**Observations:**

- Life Cycle funding target for General Capital is $635,000
- The funds available for capital for General Capital is $159,000
- Funding gap between the life cycle funding target and the funds available for capital is $476,000.
- The gap between the life cycle funding target and the funds available for capital suggests that the Lions Bay may not be able to sustain the same level of service over the long term.

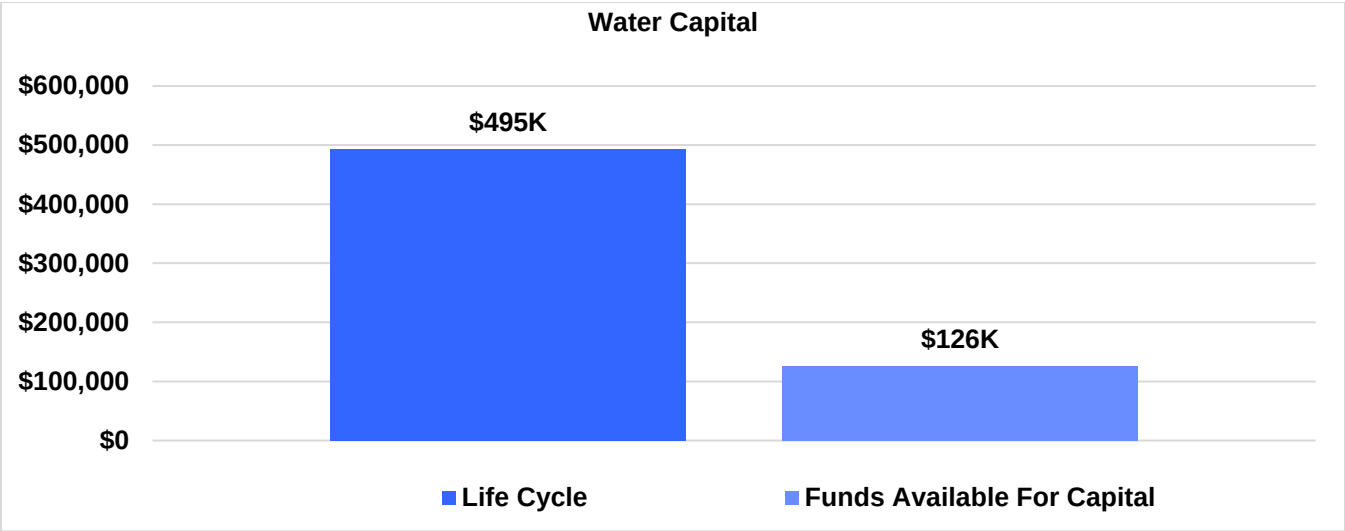



*Figure 5-3 Water Capital Life Cycle Funding Gap*

**Observations:**

- Life Cycle funding target for Water Capital is $495,000
- The funds available for capital for Water Capital is $126,000
- Funding gap between the life cycle funding target and the funds available for capital is $369,000

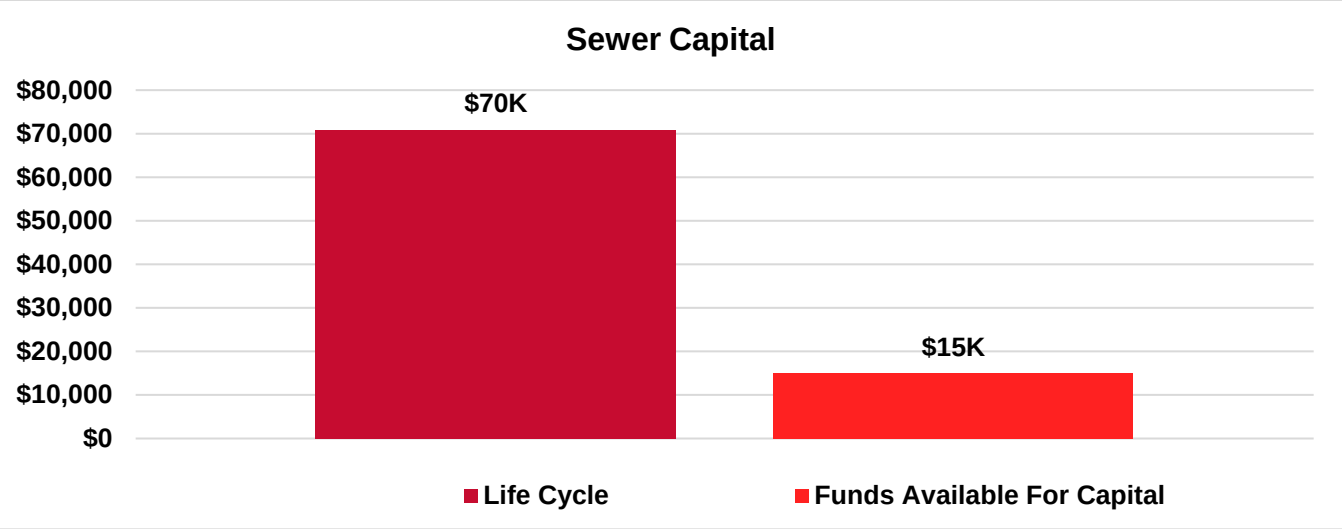



*Figure 5-4 Sewer Capital Life Cycle Funding Gap*

**Observations:**

- Life Cycle funding target for Sewer Capital is $70,000
- The funds available for capital for Sewer Capital is $15,000
- Funding gap between the life cycle funding target and the funds available for capital is $55,000
- The gap between the life cycle funding target and the funds available for capital provides insights that Lions Bay may not be able to sustain the same level of service over the long-term.

Overall, there is an organizational funding gap between the total life cycle funding target ($1.2 million) and the total current funds available for capital works (approximately $300,000) which could provide insights that over the long-term Lions Bay may not be investing at enough to sustain assets over the long-term. If 100% of the funds available for capital ($300,000) was invested into replacement, the organizational deficit would increase from 11% to 56% over the next 30 years which could result in a reduced level of service and increased risk.

Although it is not often possible for the community to meet the life cycle funding target, this measure provides a great starting point to understand the stretch funding target and forms the basis for its refinement. Over time, the community should work on refining the life cycle funding target based on risk, level of service, willingness of customers to pay and the financial capacity of the organization to meet that target, as shown in Figure 6-1 below.

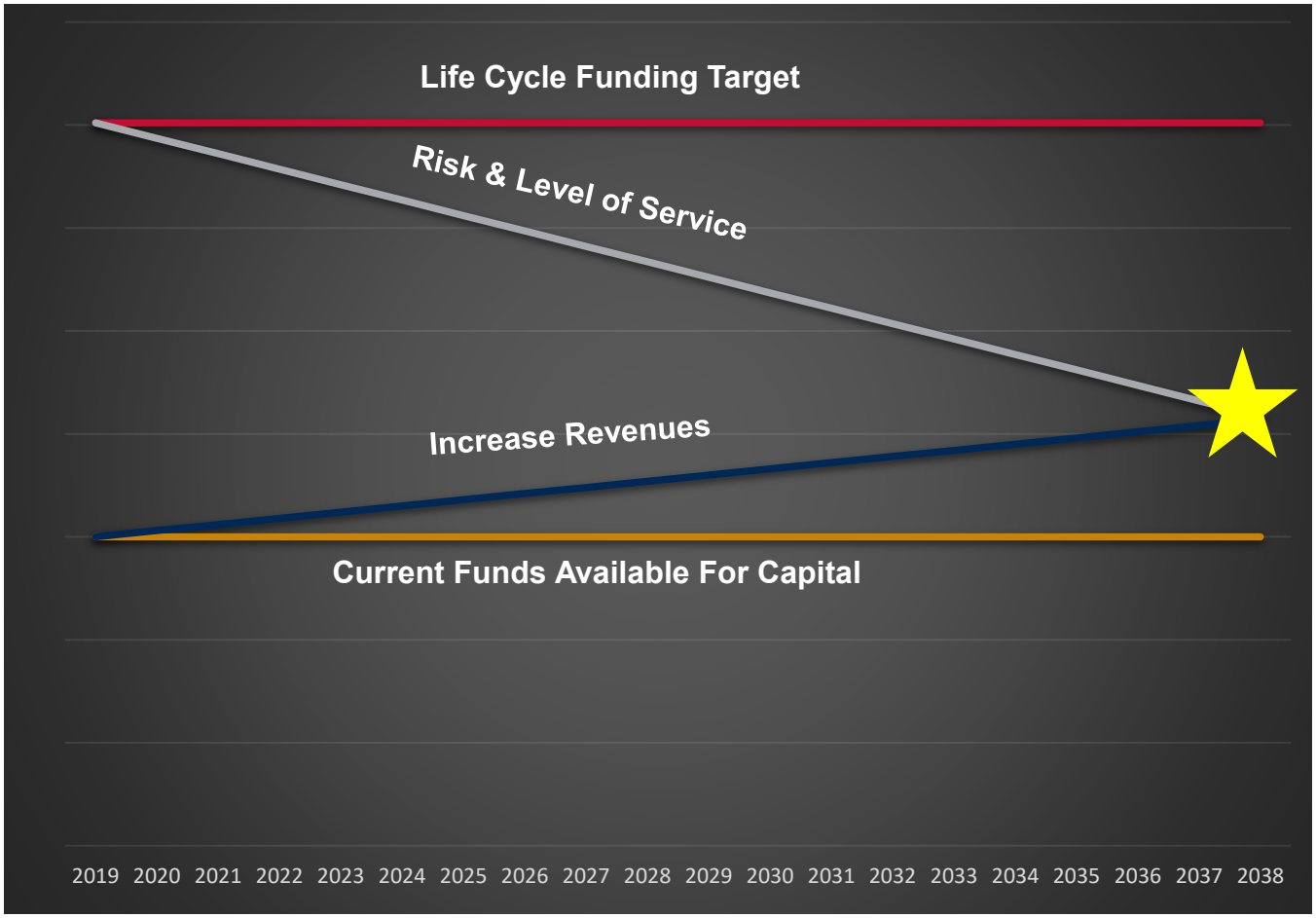



*Figure 5-5 Refining the Life Cycle Funding Target*

## 6.0 Conclusion

In summary, the total replacement cost of assets included in this study is $44.2 million in infrastructure. On average, the assets have 43% remaining life which means they are more than halfway through their lifespan, and approximately 11% of assets in this study have passed its expected lifespan (a.k.a. deficit).

Each of the metrics above (replacement cost, remaining life percentage, consumption, deficit, life cycle) provides key insights into the state of the community's infrastructure and can be used to assist with setting long-term funding targets for asset replacement. Setting an appropriate long-term funding target is critical to the future health of the community's infrastructure and directly affects the level of service, risk and fees paid by its stakeholders. In order to assist the community with setting these targets, the life cycle funding target was calculated. The life cycle funding target represents the average annual investment required to replace assets at the end of their lifespan. It was determined that there is a funding gap between the life cycle funding target ($1.2 million) and the current funds available for capital works ($300,000). This gap could provide insights that, over the long term, Lions Bay may not be investing enough to sustain assets at the current level of service. In fact, if 100% of the available $300,000 was invested into replacement, the deficit would increase from 11% to 56% over the next 30 years which could result in a reduced level of service and increased risk.

As a next step, the community should consider refining the life cycle funding target based on risk, level of service, and develop a revenue strategy to meet that target. This will provide Lions Bay with the confidence that future generations can enjoy the same levels of service as well as reasonable tax rates and user fees. Also, consideration should be given to developing an annual reporting template that would assist with communicating and understanding the infrastructure metrics provided in this report. This would provide staff with a standardized way to present this information annually to councils, staff and citizens and serve as a common document to discuss the future of Lions Bay community infrastructure.

# APPENDIX A

## Data Sources

Table A.1 below summarizes the sources of information where the asset inventory was exported from for the development of the AMIP V1. For a detailed list of the asset inventory, please refer to the AMIP excel model.

***Table A.1: Asset Inventory Source Summary***

| Asset Category | Source |
|---|---|
| Building, Drainage, Fleet & Equipment, Land Improvement, Transportation*, Sewer & Water<br>*except bridges | TCA Inventory (Financial System) |
| Water | GIS Inventory & Master Plan |
| Bridges | ISL Engineering Bridge Inspection Program (June 2018) |

Detailed inventory is shown in the Asset Management Excel Model

Replacement cost estimates were developed for each asset using the following source of information

***Table A.2 Replacement Cost Source Summary***

| Asset Category | Source |
|---|---|
| Building, Drainage, Equipment, Land Improvement, Transportation, Sewer & Water | Historical Costs were index'd to 2018 dollars using the ENR cost Index. Where possible, insurance records and recent unit replacement costs were used. |
| Water | Recent Tender Costs from projects in Lions Bay |
| Bridges | ISL Engineering Bridge Inspection Program (June 2018) |

Detailed replacement costs are shown in the Asset Management Excel Model

Service life estimates were assigned based on industry best practice documents as shown Table A. 2 below.

*Table A. 2: Service Life Sources*

| Asset Category | Source |
|---|---|
| Building, Drainage, Equipment, Land Improvement, Transportation, Sewer & Water | TCA Inventory (Financial System)<br>*Bridge condition assessment from ISL engineering and land services titled "Bridge Inspection Program" was utilized |
| Water | Guide to Tangible Capital Accounting (2008) |
| Bridges | ISL Engineering Bridge Inspection Program (June 2018) |

Detailed service life estimates are shown in the Asset Management Excel Model