Lasqueti Island Fire Protection Service
Asset Management Plan
State of Assets Report

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Purpose of the Asset Management Plan

Asset management planning is a comprehensive process to ensure that the delivery of services from infrastructure is provided in a way that is sustainable over the long term, for this and future generations.

This asset management plan details information about assets that support the Lasqueti Island Fire Protection service for qathet Regional District. This plan is intended to be a living document with this first version acting as a State of Assets Report for this service. It is intended to answer the following questions:

- What services do our assets support?
- What assets do we own and what condition are they in?
- What does it cost to sustain our assets over their useful life? Is current funding sufficient?
- What are the legislative requirements for this service?
- What are some recommended next steps? How can this plan be improved?

This asset management plan is to be read with the following qathet Regional District documents:

- Asset Management Policy 3.14
- Asset Management Strategy 2019 - 2021
- qathet Regional District Strategic Plan 2020 – 2023
- 2021 – 2025 Financial Plan Bylaw No. 567, 2021 and amendments or later versions of Financial Plan
- Lasqueti Island Fire Protection Area Establishment Bylaw No. 50, 1976 and amendments
- Lasqueti Island Volunteer Fire Protection Service Capital Works, Machinery and Equipment Reserve Fund Establishment Bylaw No. 286, 1996
- Lasqueti Island Fire Protection Service Establishment Bylaw No. 341, 2001 and amendments
- Lasqueti Volunteer Fire Department Operations Bylaw No. 509, 2016
- Land Lease from Magic Mountain Land Co-operative over Part of the NW ¼ of Section 27 for Lasqueti Fire Hall 1 (qRD File 870-33)
- Agreement between qathet Regional District and Lasqueti Last Resort Society (qRD File 2240-20-156)
- Land Lease from Duncan Craig McFeely over Part of S ½ of SW ¼ of Section 8 for Lasqueti Island Fire Hall 2 (qRD File 870-39)

In addition, Islands Trust is responsible for land use planning on Lasqueti Island. Their Lasqueti Island Official Community Plan Bylaw No. 77, 2005 (amended by Bylaw No. 86 Amendment No. 1, 2010) addresses land use. This OCP is currently being reviewed and is undergoing a rewrite by Islands Trust.

1. What services do our assets support?

The Lasqueti Island Fire Protection service provides protection to all private properties from the high water mark surrounding the Island across the entire Island. With no BC Ambulance Service or RCMP stations on the Island, the Lasqueti Island Volunteer Fire Department is the only emergency response service based on Lasqueti Island. The service currently provides for:

- Exterior Operations (fire fighters are not trained to enter into burning buildings)
- Emergency Medical Assistant First Responder
- General Rescue only (no technical rescue)
- Hazmat Awareness Level
- Public Services (open burning complaints, alarms, unknown odours)
- Fire Underwriters Survey (FUS) Insurance Grading: Not Currently Meeting FUS Requirements

2. What assets do we own and what condition are they in?

The Lasqueti Island Fire Protection service comprises the following assets:

- Apparatus (Appendix A includes photos of each):
    - 2008 Dodge Pickup 4X4 Command Vehicle
    - 2003 Ford Pumper Truck (Delores)
    - 1983 Chevrolet Pumper Truck (Chili)
    - 1987 Ford Engine (Nora)
    - 1984 Ford Tender (Tina)
    - 2003 Ford Ambulance (EMU)
- Lasqueti Island Fire Hall 1 (Main Hall known locally as the North Fire Hall):
    - The 2-bay building itself, including concrete foundation, decks, double barn doors, framing, electrical and plumbing
    - Rolls S 550 battery bank and transfer switch, Honda 3000eu gasoline generator
    - Forcible entry simulator
    - Land improvements including concrete apron and gravel driveway
- Lasqueti Island Fire Hall 2 (Satellite Hall known locally as the South Fire Hall):
    - The 2-bay building itself, including concrete foundation, overhead doors, framing, electrical
    - Outhouse
    - Backup power including Teck cable, Westquip 13kw diesel generator
    - Self-contained breathing apparatus and filling station
    - External steel storage container
    - Land improvements including concrete apron, gravel driveway, culverts
    - 22,000 litre steel water tank

The above list of assets is not comprehensive. While this list does cover all vehicles and buildings, this is not a complete list of all equipment required by the service. Future versions of this report will include a more comprehensive equipment inventory.

Total Replacement Costs of the assets identified above for use by the Lasqueti Island Fire Protection service are estimated at $2,805,600:

- Buildings: $1,149,100
- Land Improvements: $18,200
- Equipment: $78,300
- Apparatus/ Vehicles: $1,560,000

Lasqueti Island land owners and Lasqueti Island Volunteer Fire Department members value self sufficiency, resilience and outside-of-the-box thinking which has allowed frugal use of funds in maintaining the existing level of fire protection services on the Island for many years. While costs for future replacements and investments in capital may benefit from following similar frugal practices, the lifecycle cost of maintaining older apparatus to provincially legislated standards may make this practice more expensive in the long run and provide a lower level of service. It is also challenging to identify and document what it would cost to purchase second hand vehicles and equipment that may or may not be available to purchase at the time that assets require replacement. As such, the Replacement Cost estimates contained in this document reflect the costs experienced by other fire services that own similar assets and provide similar services in qathet Regional District. These Replacement Costs come from an internal qRD component estimate, referencing recent costs for contracts to construct or purchase similar assets, and other valuations within the organization. In the current construction climate and with supply chain issues being what they are, these numbers simply provide a starting place for planning for the future. They may increase over time. All estimated Replacement Costs are in today's dollars.

The Fire Hall 1 (Main Hall) has a small footprint for a 2-bay hall and is cramped on the main floor as well as upstairs. It is not built to current seismic standards according to the BC Building Code. With this in mind, it is impossible to replace this building exactly like-with-like because this will not meet current regulatory requirements. The need for the minimum required upgrade is reflected in the Replacement Costs for Fire Hall 1.

Note that there are 4 bays available at the two fire halls for 6 apparatus, which means that there is no covered storage for all the trucks at any given time. This gap in coverage should be considered when planning for the replacement of the fire halls and/or the vehicles. The Replacement Costs contained in this report are for the replacement of two 2-bay fire halls only which may not be desirable. The lot on which the Main Hall sits is just large enough to site a 3-bay hall, though to do so would impact the trail at the south side of the lot. The lot is not large enough to accommodate a 4-bay hall.

Figure 2.1 depicts the age profile of the assets associated with the Lasqueti Island Fire Protection service and their *average* Useful Life and Remaining Life.

Figure 2.2 shows the overall condition of the assets associated with this service graphed as a percentage of Replacement Costs as well as which assets are considered critical as a percentage of Replacement Costs.

Replacement Costs are based on historic and current known replacement costs with no adjustments for inflation. Future replacement costs could be impacted by many factors including, but not limited to inflation; changes in regulation/codes/standards; changes in service levels, demand and functionality; and advancements in technology. As has been experienced over the course of the CoVID 19 pandemic, construction costs are volatile and supply chains are unpredictable, which adds an extra layer of uncertainty to replacement cost forecasts.

Condition grades are defined as follows:

Excellent – still in new condition, only planned maintenance required
Good – adequate for now, minor maintenance required plus planned maintenance
Average – maintenance required to return to good condition
Poor – asset at risk of failure, significant renewal/rehabilitation required
Very Poor – physically unsound and/or beyond rehabilitation

Condition grades for the infrastructure in the Lasqueti Island Fire Protection service are based on the age of the assets and a high level physical inspection. Further refinement of these condition grades will be included in future versions of this plan.

Criticality grading identifies assets which have a high consequence of failure, but not necessarily a high likelihood of failure. For example, if the overhead doors on the satellite fire hall failed, it could stop or significantly delay an emergency response. This would be considered a high consequence of failure and thus would make the overhead doors a critical asset. A fire risk indicator sign that fails would not heavily impact safety or usability, and thus would not be a critical asset. Fire services have many assets classified as critical due to the nature of the service they provide. While a very basic attempt to classify criticality has been made in this plan, it is preliminary. Criticality is identified as an area that needs formal interpretation in the improvement plan.

Useful Life is the estimated number of years that an asset is projected to remain in operation, barring any unforeseen circumstance. The **Remaining Life** equals Useful Life less the age of the asset.

Useful Life is used to provide an estimated date that a given asset will need to be replaced. While in most cases a standard figure is being used to project the Remaining Life of an asset, the Condition, functionality and risk of failure of the asset typically impacts a final replacement date.

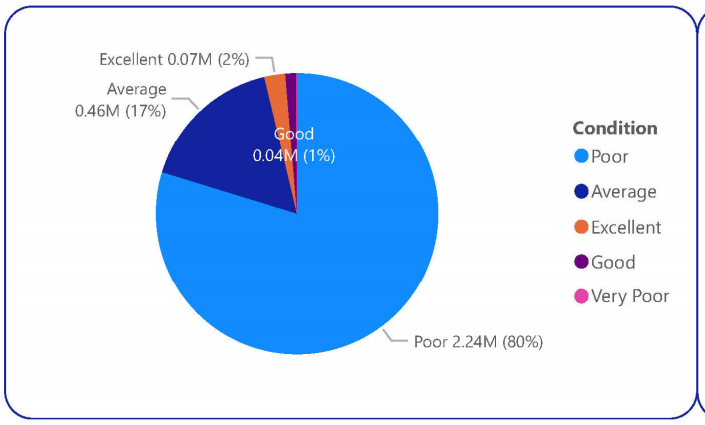
The two fire halls are made up of multiple components, each of which has its own Useful Life. The Regional District has assigned a 44 year Useful Life for the main structural components of the fire halls. The Main Hall was constructed in 1981. Its main structural components therefore will be considered passed their Useful Lives after 2025.

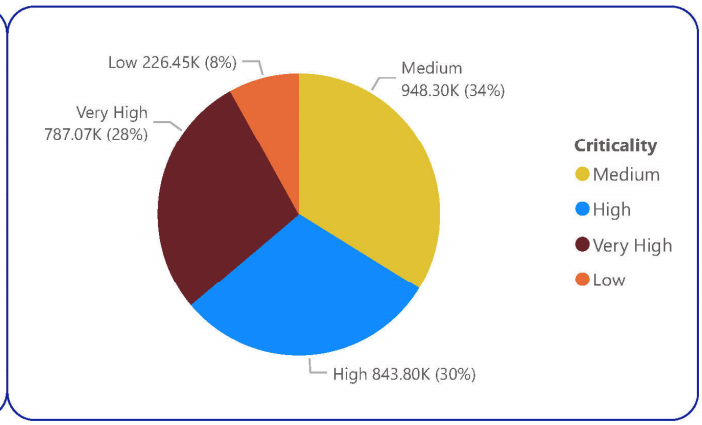
In accordance with FUS, apparatus exceeding 20 years in age do not generally receive recognition. If it can be shown through maintenance and test results that the apparatus remains reliable, the accepted age may be extended to 30 years. Apparatus are not recognized beyond 30 years of age due to unreliability factors. For the purpose of planning for this service, engines have been given a 25 year Useful Life and all other vehicles are assigned a 30 year Useful Life.

Figure 2.1 Detail Estimated Asset Replacement Cost and Age Profile

Category	Replacement Cost	Average of Estimated Useful Life weighted by Replacement Cost	Average of Estimated Remaining Life weighted by Replacement Cost
Buildings			
B120 Fire Hall No 1	**730,169**	**40**	**3**
B121 Fire Hall No 2	**403,960**	**42**	**27**
B121_02 Wood Outhouse	**2,063**	**20**	**5**
Backup Power (Teck Cable)	**2,895**	**40**	**38**
Water Supply Tank	**10,000**	**40**	**27**
Subtotal	**1,149,087**	**41**	**12**
Equipment			
Backup Power (Generators, Batteries and Switch)	**30,900**	**24**	**21**
Equipment			
Self-contained Breathing Apparatus	35,100	12	10
Training Equipment	6,825	10	8
External Storage	**5,500**	**15**	**13**
Subtotal	**78,325**	**17**	**14**
Land Improvements			
Drainage	**4,050**	**25**	**8**
Road	**14,155**	**19**	**17**
Subtotal	**18,205**	**21**	**15**
Vehicles			
Apparatus			
Command	60,000	30	16
Engine (Count of 3)	1,100,000	25	2
Rescue	150,000	30	11
Tender	250,000	30	0
Subtotal	**1,560,000**	**26**	**3**
Total	**2,805,617**	**32**	**7**

Figure 2.2 Asset Replacement Value by Condition and Criticality





3. What does it cost to sustain our assets over their useful life? Is current funding sufficient?

Figure 3.1 identifies the annual consumption of the assets associated with the Lasqueti Island Fire Protection service. Figure 3.1 summarizes multiple assets that make up a single line item. For example, B120 Fire Hall No 1 is inclusive of multiple components that make up the fire hall such as the roof, foundation, framing, electrical, pluming, HVAC, concrete apron, generator, etc. Each of these components have unique Useful and Remaining Lives. The figures identified are averages of all components.

Replacement Costs, Useful Life and **Remaining Life** are defined above.

Annual Asset Consumption is the annual capital investment required to ensure that assets can be replaced like-with-like at the end of their Useful Lives. In very simple terms, it is the amount of the asset's value that is being 'consumed' annually and ultimately, the amount that should be being placed into reserves on an annual basis if the Regional District wants to be sure that it can fund the replacement of each asset at the end of its Useful Life. This amount does not include any operations or maintenance costs or any unforeseen costs. As noted, the funding requirements listed are only to replace like-with-like and do not cover any costs associated with any upgrades to the existing infrastructure or any new infrastructure that may be required in future years. The exception to this is if a similar asset will not meet minimum regulatory requirements, in which case Replacement Costs are based on the minimum needed to achieve this standard. Another assumption is that new, not second-hand apparatus will be purchased when renewing the fire protection fleet.

The average **Annual Reserve Transfer** over the last 10 years into the Lasqueti Island Fire Protection service was $20,190 excluding interest. There is one statutory reserve for this service which is available for capital expenditures only. The Annual Reserve Transfer, along with the reserve opening balance ($221,090 in 2021) has been saved through a combination of donations to the service, annual operating budget surpluses and budgetary reserve contributions.

If the Regional District and the users of the Lasqueti Island Fire Protection service continue with this level of Annual Reserve Transfer ($20,190), there will be an **annual shortfall of approximately $78,000** to cover the replacement of the assets identified in this plan. This means the service is approximately 20% funded.

Figure 3.1 Average Annual Asset Consumption

Asset Hierarchy	Replacement Cost (Sum)	Average of Replacement Year weighted by Replacement Cost	Average of Estimated Useful Life weighted by Replacement Cost	Average of Estimated Remaining Life weighted by Replacement Cost	Annual Asset Consumption (Sum)
⊟ AM_Fire_Lasqueti					
⊟ Buildings					
⊞ B120 Fire Hall No 1	730,169	2026	40	3	21,389
⊞ B121 Fire Hall No 2	403,960	2049	42	27	10,353
⊞ B121_02 Wood Outhouse	2,063	2027	20	5	105
⊞ Backup Power (Teck Cable)	2,895	2060	40	38	72
⊞ Water Supply Tank	10,000	2049	40	27	250
⊟ Equipment					
⊞ Backup Power (Generators, Batteries and Switch)	30,900	2043	24	21	1,437
⊟ Equipment					
Self-contained Breathing Apparatus	35,100	2032	12	10	2,925
Training Equipment	6,825	2030	10	8	683
⊞ External Storage	5,500	2035	15	13	367
⊞ Land Improvements	18,205	2037	21	15	903
⊟ Vehicles					
⊟ Apparatus					
Command	60,000	2038	30	16	2,000
Engine (Count of 3)	1,100,000	2024	25	2	44,000
Rescue	150,000	2033	30	11	5,000
Tender	250,000	2022	30	0	8,333
Total	**2,805,617**	**2029**	**32**	**7**	**97,816**

20K
10 Year Average Reserve T...

98K
Annual Asset Consumption

-78K
Renewal Budget Gap

Figures 3.2, 3.3 and **3.4** forecast the reserve levels over a 10-year term, a 20-year term and a 40-year term respectively for the Lasqueti Island Fire Protection service.

The black dotted lines simply indicate the overall trend within the timeframe of each figure.

The blue line indicates the available reserves for each year if the amount transferred to reserves annually remains the same as is indicated in Figure 3.1 ($20,190) and assets are replaced like-with-like (where possible with buildings, as well as replacing existing fleet with new apparatus) at the end of their Useful Lives. These figures show that the service is underfunded to replace the assets like-with-like, and that there will not be sufficient reserve funds to complete the renewals within the 10-year horizon; the trend continues throughout the renewal cycle. According to the age-based condition data and FUS vehicle replacement parameters, the major replacements would begin with Fire Hall 1 around 2025. The existing apparatus over 30 years old are shown to be replaced in 2022, with another one coming due in 2027.

Figure 3.2 Reserve Levels Forecast - 10-year term

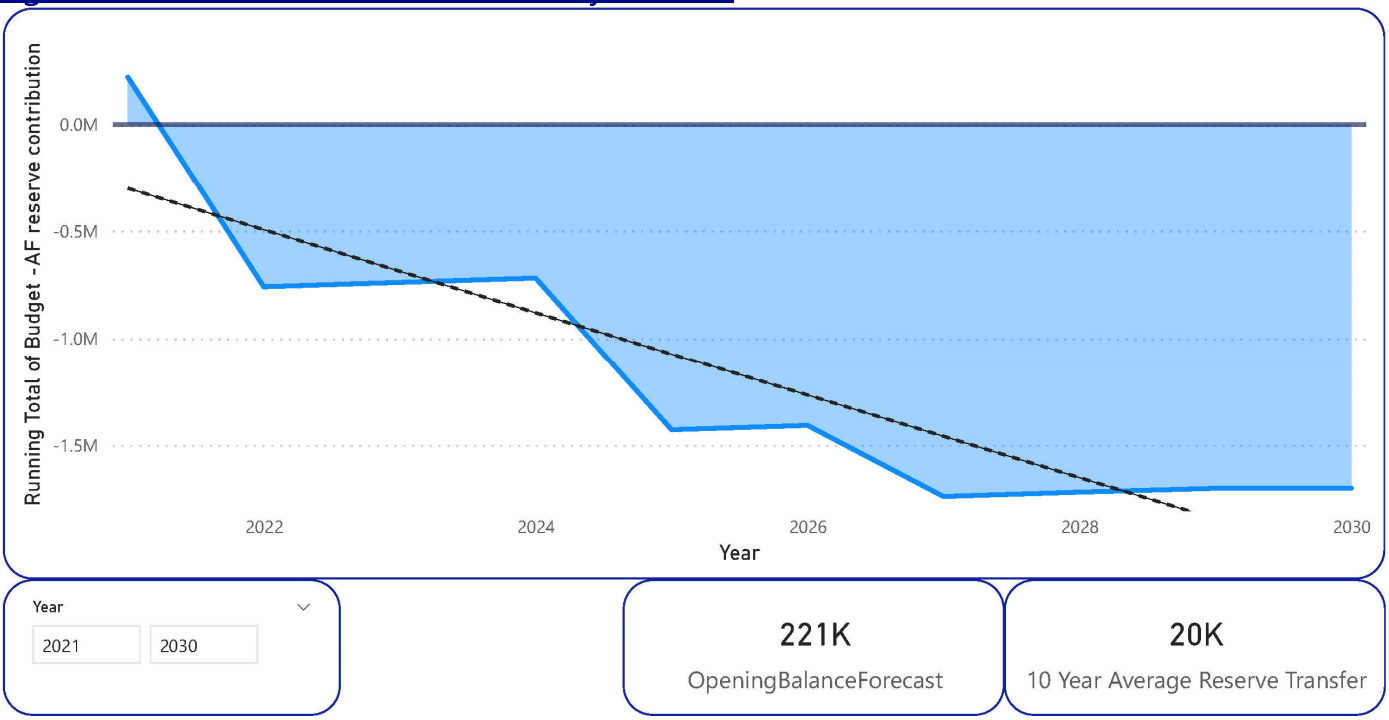


Figure 3.3 Reserve Levels Forecast - 20-year term

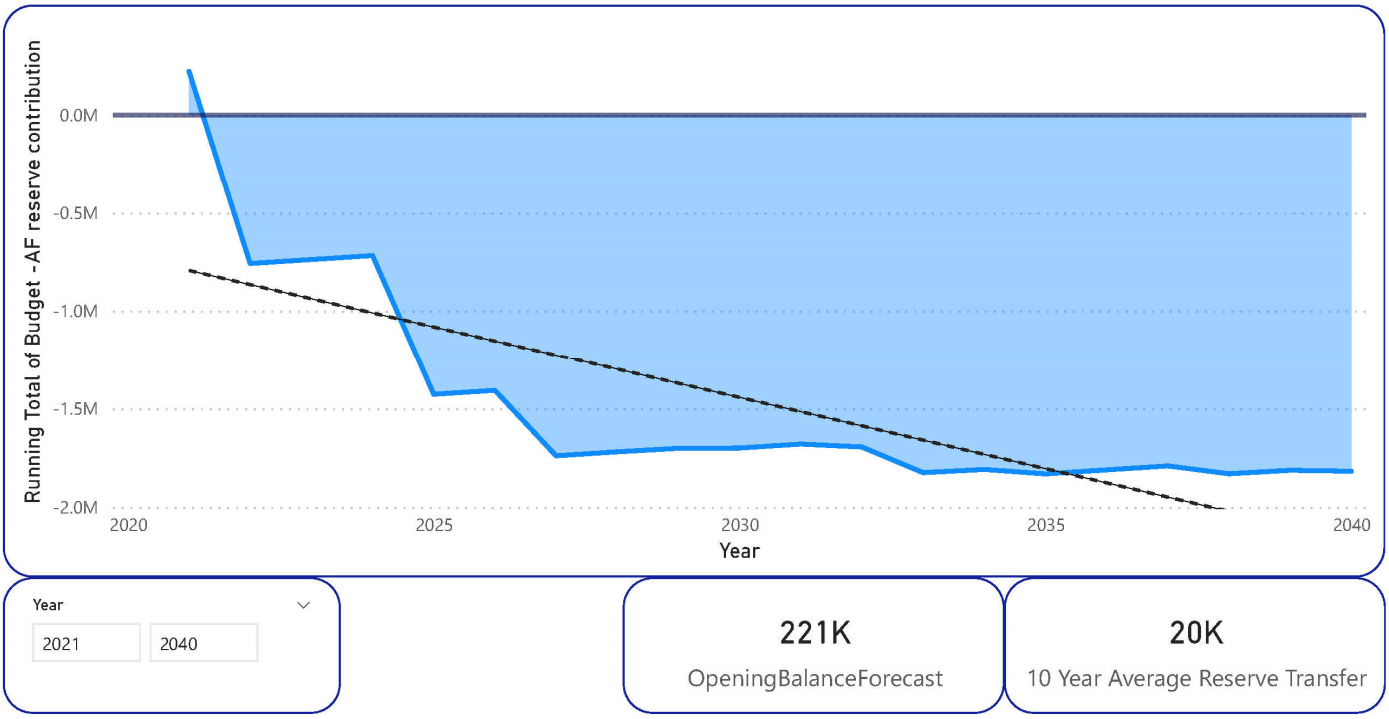
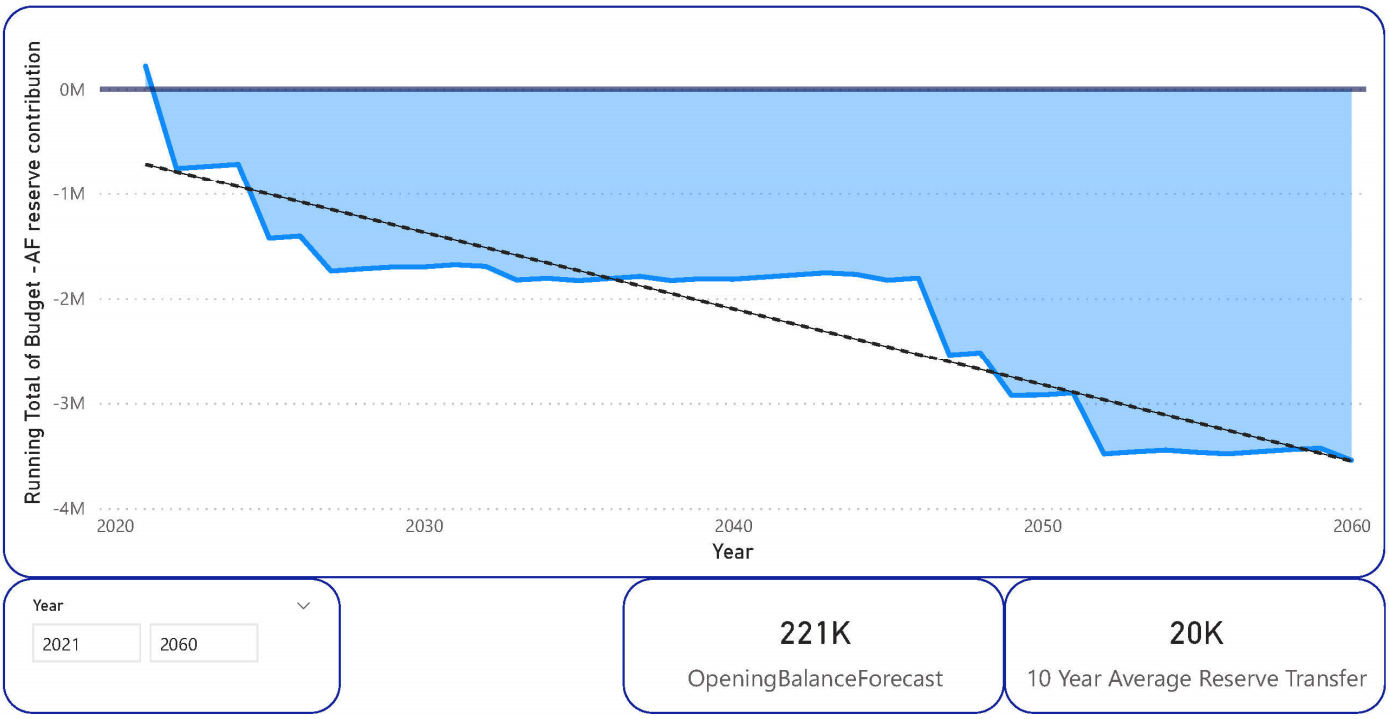


Figure 3.4 Reserve Levels Forecast - 40-year term



4. What are the legislative requirements for this service?

In accordance with qathet Regional District Asset Management Policy 3.14, at a minimum the established levels of service shall meet all legislative, regulatory, and statutory requirements.

The primary legislation governing the Lasqueti Island Fire Protection service relates to operational issues. However the following should be considered as part of any discussion on asset replacement for this service.

- The BC Building Code BA 2018 1 sets the standards for construction and renovation of main fire halls (post-disaster buildings) and for satellite fire halls (medium- and low-hazard industrial occupancies).
- Workers Compensation Act [RSBC 2019] c. 1 with amendments and regulations
- Fire Services Act [RSBC 1996] c. 144 with amendments and regulations
- Motor Vehicle Act [RSBC 1996] c. 318 with amendments and regulations
- The Fire Underwriters Survey (FUS) provides data on public fire protection to about 85% of Canada's private property insurers. While the FUS does not directly set insurance rates, their assessments affect insurance rates for property owners. The grading process involves:
    - Risk assessment – Assessing building stock details for the entire fire protection service area including building size, construction, exposures, occupancy, and fire protection systems. This determines the community's fire hall, apparatus and staffing needs.
    - Fire Department – Assessing apparatus, distribution of halls, staffing, training, maintenance, pre-incident planning, etc.
    - Water Supply – In particular, the water system's ability to deliver adequate water to control major fires throughout the fire protection area on a reliable basis.
    - Fire Safety Control – Fire prevention activities such as public education, which do not affect asset management planning directly.

  LIVFD is not currently meeting FUS requirements for insurance grading.

5. What are some recommended next steps? How can we improve this plan?

This data-driven report is a living document that will eventually evolve into a more comprehensive asset management plan which will include:

- **Level of Service Objectives:** Future versions of this plan will include level of service alternative options and the financial implications associated with each option.

- **Complete Asset Data:** The asset registry is substantially complete for the fleet and buildings. Future versions of this plan will have a more detailed equipment inventory.

- **Detailed Condition Inspections:** Detailed condition inspections of the buildings are recommended and will offer improved condition reporting in future versions of this plan.

- **Criticality:** Criticality is an area that needs formal interpretation in future versions of this plan. This State of Assets Report contains a high level look at criticality only.

- **Risk Analysis:** Formal risk analysis will be done in conjunction with criticality in future versions of the plan. Service and risk consequences of asset renewal alternative options will be identified.

- **Natural Assets:** Natural assets make a good model for low cost sustainable infrastructure. Exploring ways to imitate natural solutions and work more closely with the environment could be considered, perhaps for water storage.

- **Possible Asset Retirement Obligations:** Asset retirement obligations are being considered for all qathet Regional District services. Any obligations for this service will be considered in future versions of this plan.

Appendix A

Lasqueti Island Fire Service Existing Fleet

2008 Dodge Pickup 4X4 Command Vehicle

2003 Ford Pumper Truck (Delores)

1983 Chevrolet Pumper Truck (Chili)

1987 Ford Engine (Nora)

1984 Ford Tender (Tina)

2003 Ford Ambulance (EMU)