

DISTRICT OF SQUAMISH

MOUNT GARIBALDI CEMETERY MASTER PLAN



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TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Overview	1
1.2	Planning Process	2
1.3	National and Provincial Trends	3
1.4	GHG Emissions	8
2	DEFINING THE MARKET	11
2.1	Population Growth	11
2.2	Mortality Rates	14
2.3	Squamish Resident Deaths	14
2.4	Dispositions	15
2.5	Interment Demand in Mount Garibaldi Cemetery	17
2.6	Interment Services Offered	18
3	CEMETERY CAPACITY AND FINANCIAL ANALYSIS	19
3.1	Introduction	19
3.2	Cemetery Capacity	20
3.3	Cemetery Revenue	23
3.4	Cemetery Costs	28
3.5	Financial Projections	29
3.6	Financial Summary.....	32

4 CEMETERY CONCEPT PLANS 33

4.1	Site Inventory and Analysis.....	34
4.2	Guiding Principles and Program.....	36
4.3	Concept Plan Options.....	37
4.4	Preferred Concept Plan	38
4.5	Phasing Plan and Cost Estimate	40

5 IMPLEMENTATION PLAN 45

5.1	Service Delivery.....	45
5.2	Action Items.....	46

APPENDICES 47

Appendix A:	Data Used for GHG Calculations
Appendix B:	Population, Mortality and Interment Trend Analysis
Appendix C:	Projected Needs Analysis
Appendix D:	Concept Plan Options
Appendix E:	Cost Estimate

MAPS

1	Site Inventory and Analysis
2	Concept Plan



Historic Gate

EXECUTIVE SUMMARY

Squamish is growing at a rapid pace, and the developed portion of its cemetery is approaching capacity for some services. An undeveloped portion of the cemetery offers space for expansion. This Master Plan for Mount Garibaldi Cemetery provides guidance on the planning, design, and financial aspects of the cemetery expansion.

This master plan was guided by District staff from multiple service areas – cemetery, community parks and trail maintenance, planning, engineering, public works, and records management. That group had input during the entire planning process. A stakeholder workshop was also held early in the process, and a community survey in May 2020 was completed by 20 respondents.

The following are some of the key national and provincial trends related to cemetery services:

- Cremation is increasing and is currently at around 85% in BC
- Green burial is of growing interest and is being offered by more local cemeteries

Projections of the District's population, mortality rates, and dispositions provide information on interment needs over the next 30 years. The developed portion of the cemetery has capacity to support full and cremains (cremated remains) burial, and columbarium (niche), services for the next five to 30 years. There will be a demand for around 2,800 interments over the next 30 years, of which around 80% will be cremations.

The District currently subsidizes operating costs, and the subsidy climbed to 59% in 2018. A major increase in fees for non-residents has reduced use of the cemetery by those without ties to the community. Fees for residents are significantly lower than those of other cemeteries in the Lower Mainland. The financial analysis explored several options for increasing fees and the effects on the District subsidy of operations.

A proposed cemetery concept plan expands services to include green burial and a scattering garden and improves the experience and functioning of the existing and future portions of the cemetery. The following is a summary of the phases of the concept plan:

- **Phase 1** – upgrade the existing developed part of the cemetery with a paved parking lot, new west fence, tree planting, restoration of historic features, and scattering garden
- **Phase 2** – extend the south portion of the cemetery to the east, relocate and expand/improve maintenance area, add a new service access, paved seating areas, tree planting, and existing interment options plus green burial and scattering garden
- **Phase 3** – extends the north portion of the cemetery to the east, building on the services and features in Phase 2

An implementation plan provides suggestions for improving service delivery as the cemetery expands, and it identifies next steps in implementing this Master Plan.





1 INTRODUCTION

Old section

1.1 OVERVIEW

Squamish is growing at a rapid pace, and the developed portion of its cemetery is approaching capacity for some services. More space is needed for a full range of interment options, as the District would like to expand its cemetery services. This Master Plan provides guidance on the planning, design and financial aspects of the cemetery expansion.

The District of Squamish (District) owns and operates a cemetery called the Mount Garibaldi Cemetery (MGC) that dates back to the early 1920s. MGC is located at 44500 Government Road approximately 10 kilometres north of downtown Squamish. The cemetery site is 4.77 hectares, of which around one-third is developed, and the remainder is forested.

The District offers full burials (full earth interment) with marker and vase installations, cremation interments in dedicated plots and above full burials, memorial bench donations, and exhumations. Some of the full burials are in pre-installed concrete vaults. There are separate fees for residents and non-residents.

Within the cemetery, there is a space with columbaria (niche walls) and a memory book (memorial plaques for those interred elsewhere). The Squamish Funeral Chapel has an agreement with the District to build and operate the columbaria and memory books. This is planned to be built over 11 phases.

MGC is regulated by the District's *Cemetery Bylaw 1532, 2003*. The provincial *Cremation, Interment and Funeral Services Act* and the *Business Practices and Consumer Protection Act* also regulate municipal and private cemeteries in BC.

1.2 PLANNING PROCESS

This master plan was guided by District staff from multiple service areas – cemetery, community parks and trail maintenance, planning, engineering, public works, and records management. That group had input during the entire planning process.

A stakeholder workshop was held early in the process. Invitations were sent to faith leaders, the Squamish Nation, local funeral service providers, the Legion, and other organizations with ties to the cemetery. One funeral service provider and one Legion representative attended the workshop. The District also reached out to the Squamish Nation directly.

A presentation to Council was provided in January 2020, including several fee scenarios. Council requested more community input. From March 12 to April 22, an online community survey was conducted through the District's website, with notifications sent out by email and social media. There were 20 complete responses, with 11 additional partial responses. The following is a summary of the input received:

- **48% of respondents are very familiar with the cemetery** (visit frequently) and 36% are somewhat familiar (visit occasionally)
- **Most visit to pay respects to a loved one** (57%), for an interment (43%), or for another reason such as a quiet walk (38%)
- **52% expect to be cremated** and **16% buried** (including green burial)
- **26% have purchased a plot or niche** and **30%** more are likely to be interred at Mount Garibaldi Cemetery
- The following are the cemetery services, in order of preference, in which respondents are somewhat or very interested:

▶ green burial with group marker		61%
▶ green burial with individual marker		61%
▶ memorial with no interment		50%
▶ scattering garden		43%
▶ columbarium niche		35%
▶ family columbarium		26%

- The following are the cemetery features, in order of preference, in which respondents are somewhat or very interested:



- All live in Squamish and represent a full range of age groups
- The most frequent comment was a request for four vs three sets of cremains in a full burial plot

The low response rate makes it difficult to use the survey results as a key planning tool. However, it does indicate potential interest in new cemetery services among residents.

1.3 NATIONAL AND PROVINCIAL TRENDS

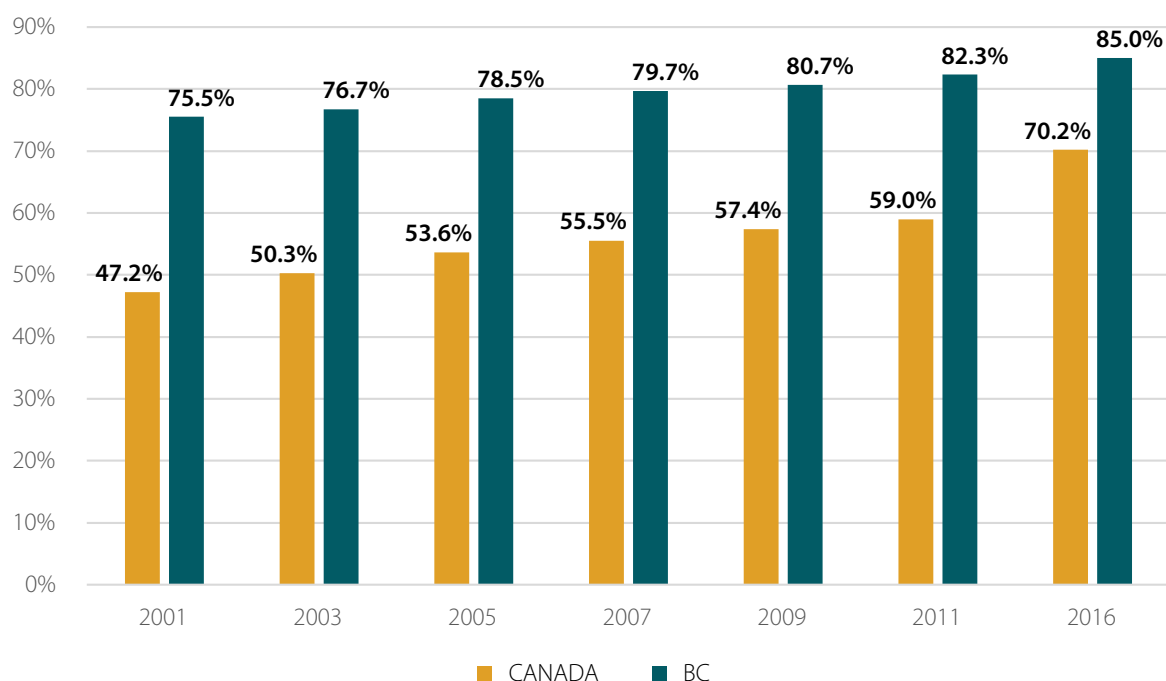
Trends involving interment practices need to be considered to accurately assess the future cemetery needs for Squamish. This section examines trends occurring nationally and provincially that include more diverse forms of interment and memorialization.

Cremation

Across Canada, there has been a growing increase in cremation compared to traditional full burial (**Figure 1.2**). Since 2001, the cremation rates in Canada, excluding Quebec, have increased from 47.2% in 2001 to 59.2% in 2011. The largest proportion of that increase occurred from 2001 to 2006, which saw a 10% increase in the percent of deaths cremated. From 2006 to 2011, the increase flattened with an overall increase in deaths cremated by 1.9%.

British Columbia has historically had the highest cremation rate among the provinces and territories (**Figure 1.2**). In 2001, British Columbia had 75.5% of all deaths cremated, a figure that was approximately 16% higher than the second highest, Yukon Territory. In 2011, British Columbia's cremation rate experienced a minor increase to 82.3%, and it has remained the province or territory with the highest cremation rate in the country. It was projected that this rate would rise to 85% in 2016.

Figure 1.2: Percentage of Deaths Resulting in Cremation in British Columbia and Canada



Source: Cremation Association of North America, 2017; BC Vital Statistics, 2018

The Cremation Association of North America cites five major factors for the rise of cremations and the decline of the full burials, as follows:

1. **Cost** – Typical cremation costs average between \$1,000 and \$3,000, compared to a full traditional burial, which averages between \$6,250 and \$8,000.
2. **Range of Options** – The options for memorialization offered by cremation are diverse and appealing. Cremains can be placed in single or multiple locations, buried or sealed in niches in cemeteries, scattered in appropriate locations, or divided into keepsake urns, jewelry and other items that may be shared by loved ones.
3. **Environmental Impact and Land Consumption** – Full burials require more land and are seen by some as having more significant environmental impacts.
4. **Location and Transport** – Cremation allows for the easy and inexpensive transport of a loved one's remains.
5. **Religious Acceptance** – Many religions now accept cremation and some have begun to plan and install columbaria on their religious grounds.



Columbarium Walls and Memory Book

The evolution of burial practices within religions that have long histories in Canada has influenced the cemetery services offered in Canada. The allowance of cremations by the Catholic Church in 1963 has led to a continual increase in the number of Catholic cremations. There has also been a gradual increase in the number of Jewish cremations, a practice that is contrary to Jewish traditions. Changing religious norms and the acceptance and convenience of cremation are factors in the increase of cremation as the most popular method of disposition in BC.

Along with the increase in cremations, the death service industry has responded by expanding options within cemeteries and memorial gardens. Interment of cremains in a cemetery enables families to visit the remains of their loved ones in a location that is permanent, protected, and contemplative. The interment methods include columbaria, niche walls, scattering gardens, and burial of cremains in dedicated plots or combined plots that may include a full burial. Cemeteries are finding that a broader range of services can enable them to meet more diverse needs.

Cemeteries and memorial gardens are also including memorial plaques for honouring loved ones who may be interred elsewhere. This is attractive to families who have relocated or for loved ones who lived in multiple locations.



Green or Natural Burial

Green or natural burial is a trend that is gaining traction among western nations, including Canada. Green burial involves returning a body as naturally as possible to the earth. The body being interred is not embalmed or cremated; it is placed in a simple biodegradable shroud or casket and buried without a liner or vault. Vegetation is planted (often native trees, shrubs and/or meadow plants) and allowed to naturalize, and the names of those interred in an area are typically inscribed on a communal marker or plaque.

This method is a low-impact alternative to traditional full burials, which introduce toxic chemicals into the environment from the embalming process, and typically involve large quantities of metal, hardwood and/or concrete used for caskets, crypts and/or liners. Green burial also has less environmental impact than cremations, which use large amounts of energy and materials to cremate a body. Cremains and full burials contain metals such as lead, boron, cadmium, chromium, and cobalt that can be toxic to the environment, which could be a concern related to the scattering of remains in natural settings.

There are now over 270 natural burial sites in the United Kingdom. BC currently has several cemeteries offering this option, the most active one being Royal Oak Burial Park near Victoria. Royal Oak has been offering green burials since 2010, and as of early 2018, has completed 210 green burials, and presold 200 green burial plots.

Green burial now accounts for approximately 20-25% of all interment sales at Royal Oak (full burial and cremated options combined). This percentage is increasing annually. Not many clients switch from traditional burial to green burial. About 30% of clients who pre-purchased cremation, or would have previously chosen cremation, have switched to green burial. The main driver is that green burial is the most straightforward of the three options - no caskets or urns are required. Some also embrace the minimalistic philosophy and will change from scattering (costing a few hundred dollars) to the more expensive green burial option because they believe in it so strongly.

Variations of natural burial are quite common, e.g., placement of unembalmed remains in a biodegradable covering within a traditional full burial plot (sometimes with an all-natural monument), or natural burials with individual rather than group markers. Smaller communities are also becoming interested, e.g., Denman Island has a new green burial ground, and Whitehorse is planning to include natural burial spaces in the future expansion of their municipal cemetery. The “greenest” expressions involve additional measures such as not using machinery or motor vehicles as part of the burial process.

Green burials are usually a less expensive option than a full burial and can cost more or less than cremation. Green burial can bypass expenses such as embalming, vaults, and headstones; on the other hand, there are costs for the use of land and vegetation. As an example, per Royal Oak Cemetery’s current fee schedule in Victoria, the cost of green burial is between 65-75% of the cost of a full burial and 20% more than the cost of a cremation interment; this cemetery cremation interment fee does not include the cost of cremation, which in most cases would make the total cost of cremation higher than green burial.

There are two primary methods of planning green burial plots. One is to enable customers to purchase a specific plot. This can enable couples to be interred together; however, it delays opportunities for planting until all interments in an area are complete. The other approach is to inter sequentially. This allows for immediate planting, with the condition being that the deceased are not necessarily buried close to their family members.



Examples of green burials

1.4 GHG EMISSIONS

The District of Squamish has established a Community Climate Action Plan to identify actions to significantly reduce local greenhouse gas emissions. This is in support of the international effort to limit global warming to 1.5 degrees Celsius. To achieve this goal, the Intergovernmental Panel on Climate Change (IPCC) indicates that emissions must be reduced by at least 45% from 2010 levels by 2030, reaching 'net zero' around 2050. To support this goal, Council requested an analysis of GHG emissions associated with various cemetery practices.

The following is a high-level comparison of the CO₂ emissions related to cremation, full burial, and green burial. Some of the data used in these calculations, which is derived from multiple sources, is provided in **Appendix A**.

The following are the potential contributors to emissions for each of these options.

Cremation

- Release from fuels used for burning
- Release of chemicals from the remains
- Materials for burning, urns, and headstone or niche

Full Burial

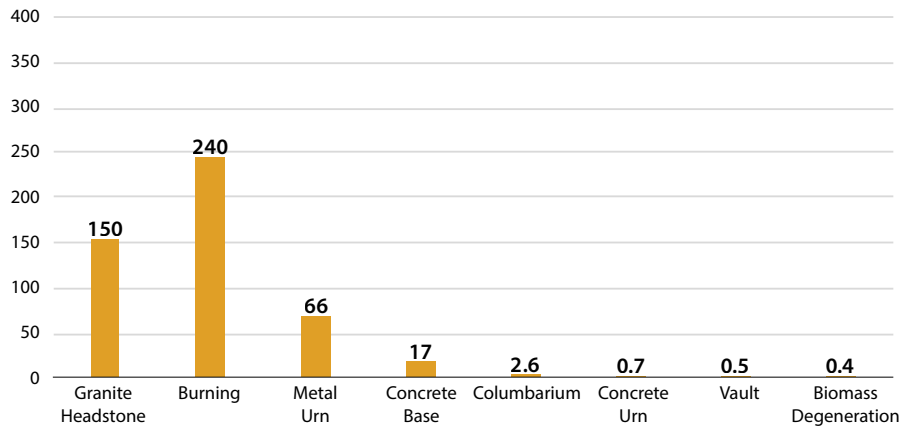
- Embalming
- Materials for concrete or fiberglass grave liner or vault
- Materials for casket
- Excavation and installation – equipment emissions
- Materials for headstone with concrete base
- Mowing grass

Green Burial

- Materials for biodegradable casket or shroud
- Excavation and installation – equipment emissions
- Materials for group memorial
- Maintenance of plants

The following tables provide a summary of potential GHG emissions for the components of typical services:

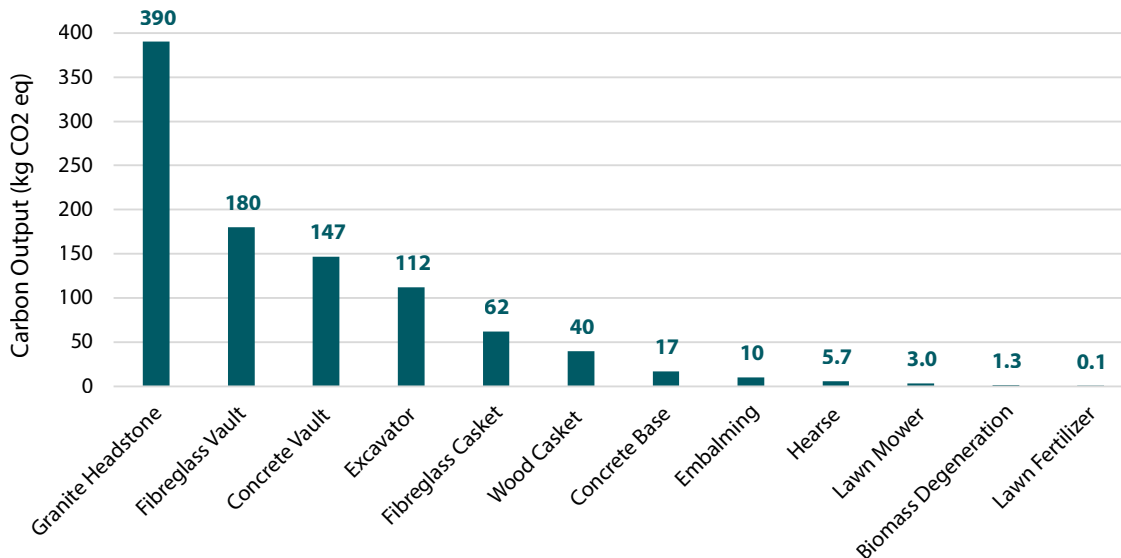
Cremation



Approximate total CO₂ emissions for cremation plot – 475 kg

Most of the GHG emissions from cremation are from the cremation process itself.

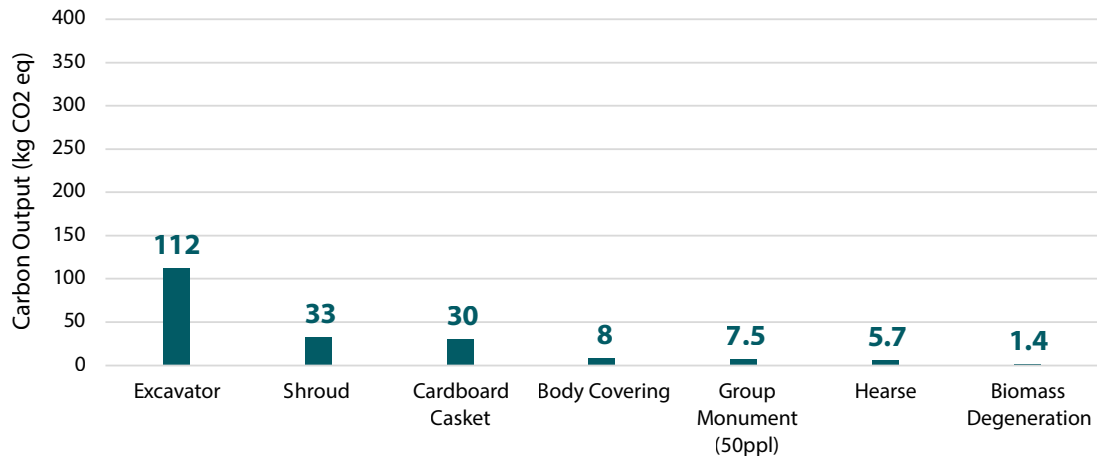
Full Burial



Approximate total CO₂ emissions with concrete vault and wood casket – 726 kg

Most of the GHG emissions from full burial are from the granite headstone and vaults.

Green Burial



Approximate total CO₂ emissions with cardboard casket – 157 kg

Most of the GHG emissions from full burial are from the excavator. Very green burials may involve hand digging, but that is not practical in a municipal cemetery.



2 DEFINING THE MARKET

2.1 POPULATION GROWTH

Approach

This analysis uses an independent population forecast for the District of Squamish prepared by Urban Systems, using BC Stats' regional population forecasts as a starting point. The process for preparing the forecast was as follows:

- Reviewed the BC Stats' P.E.O.P.L.E. 2018 forecast, by age cohort, for the Squamish-Lillooet Regional District (SLRD), to 2041 (current forecast horizon)
- Extended the age-specific SLRD forecasts from 2041 to 2048 using a 'simple exponential smoothing' forecast function in Excel (ETS)¹
- Projected District of Squamish population based on age-specific ratios of 'District-to-SLRD' population over time
 - ▶ Historical ratios, by age cohort, were calculated using BC Stats' and Statistics Canada data back to 2006
 - ▶ Age-specific trends in these ratios were calculated for 2006, 2011 and 2016, and projected forward to 2048 using the exponential smoothing forecast function (ETS)

¹ Exponential smoothing predicts future values (population by cohort) using a weighted sum of past values. It uses an exponentially decreasing weight for past observations.

- ▶ Projected ratios were applied to the SLRD population forecast to arrive at a baseline District of Squamish forecast, by age cohort
 - This baseline forecast shows Squamish's total population growing to 31,650 by 2048
- ▶ The baseline population projection was reviewed with District staff
 - Based on staff direction, it was decided that an 'inflation factor' should be added to the forecast of each age cohort to bring the outcome closer to the 'medium population growth scenario' that was used in the 2017 OCP²
- ▶ An inflation factor of 20% was applied to the baseline forecast to produce the final forecast used to project cemetery needs

Note: Population growth was analyzed in early March 2019 and projected for the next 30 years using the most current information available. The District should update the population projections as new information becomes available.

Results

The resident population for the District of Squamish is projected to grow from an estimated 21,260 in 2019 to 36,529 by 2048, for an average annual growth rate of 1.9%.

Figures 2.1 and **2.2** show the forecasts to 2048 in consolidated age groupings.

Figure 2.1 District of Squamish Population Forecast to 2048

Age Group	2019	2029	2039	2048
<25	6,504	7,804	8,488	8,983
25-44	6,830	7,390	8,700	9,426
45-64	5,587	8,008	9,378	9,664
65+	2,344	4,328	6,449	8,455
Total	21,265	27,530	33,015	36,529

² The OCP population forecasts were not directly adopted for this cemetery needs exercise because they were not broken out by age cohort.

Figure 2.2 District of Squamish Population Forecast to 2048 by Consolidated Age Grouping

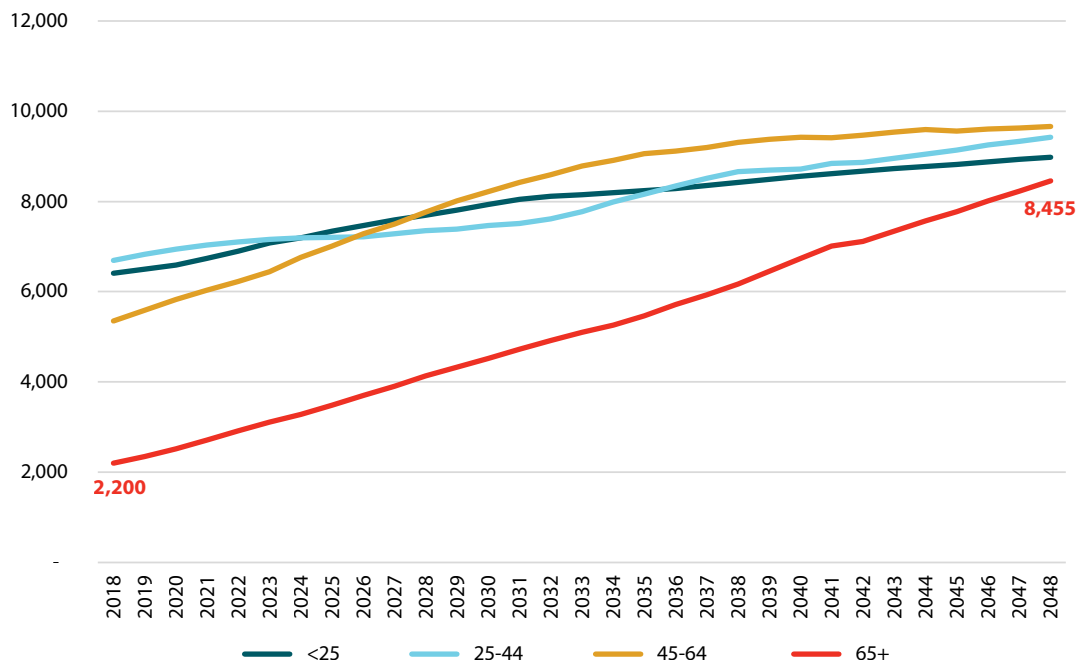
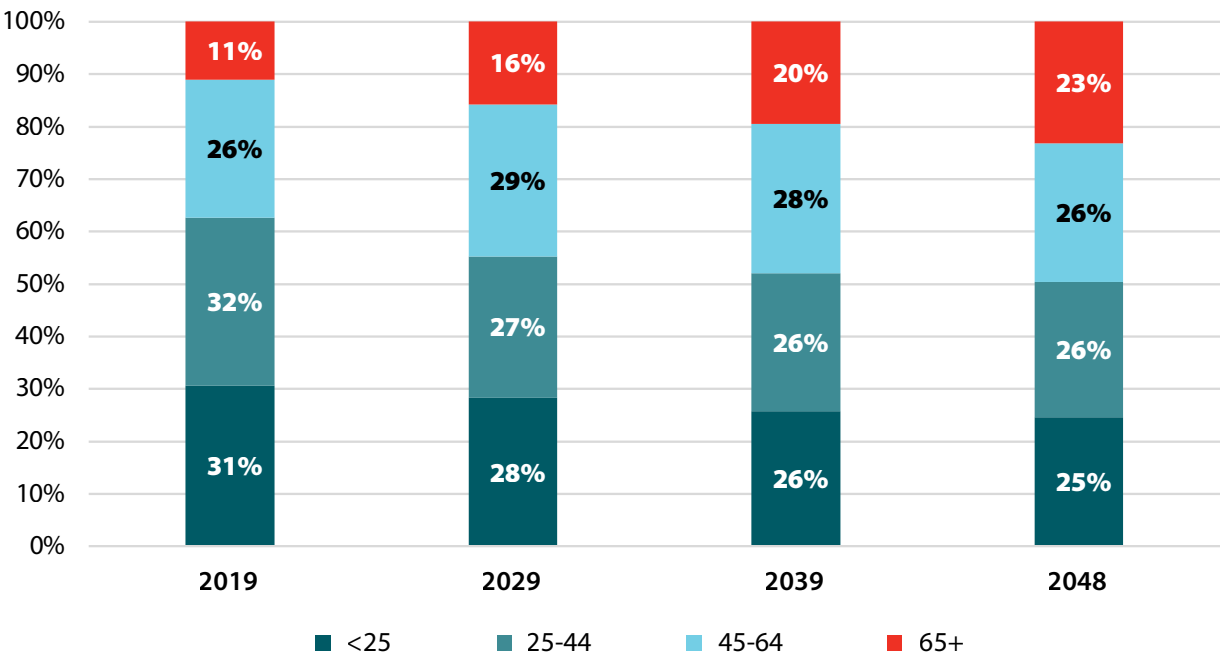


Figure 2.3 shows the projected breakdown of the District population by consolidated age grouping as proportions of the total. The age profile of the District is expected to skew older over time. The 65+ population accounts for approximately 11% of the total population in 2019. This is projected to increase to 16% by 2029, 20% by 2039 and 23% by 2048.

Figure 2.3 District of Squamish Population Proportions by Consolidated Age Group to 2048



2.2 MORTALITY RATES

Historical mortality rates (by age cohort) were calculated for the SLRD using death and population data from 2001 to 2017.³

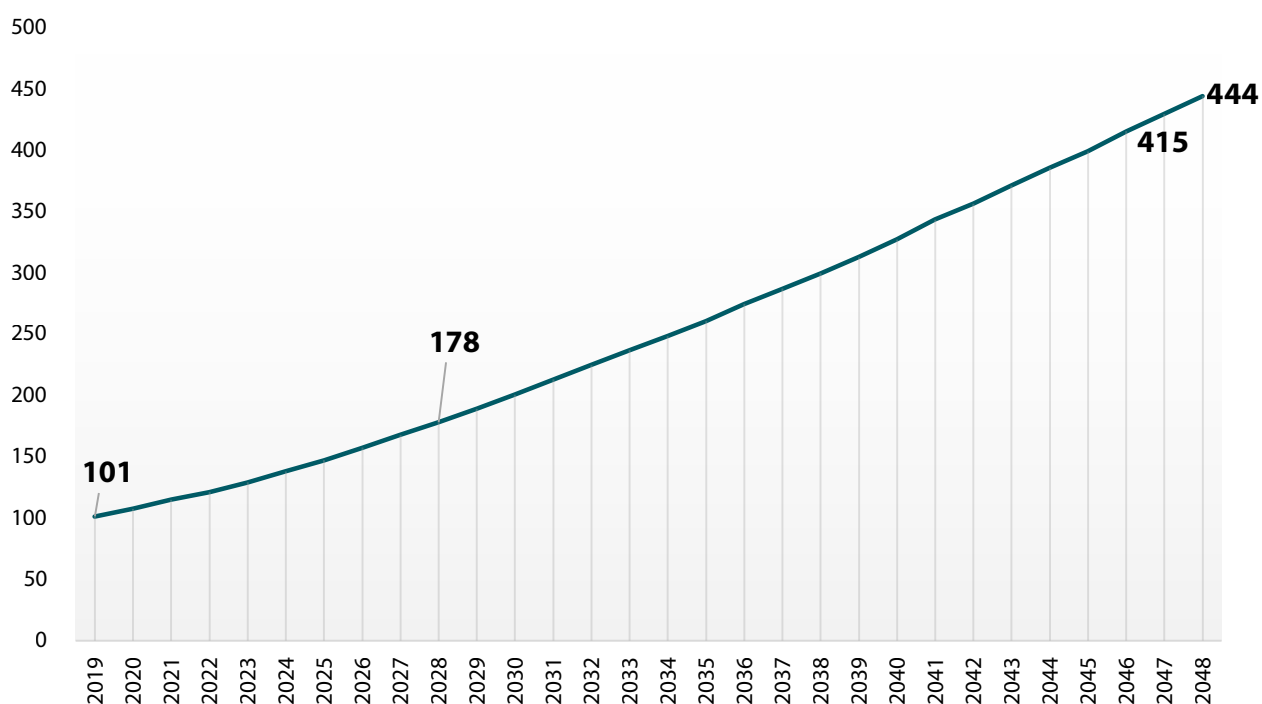
Rates of year-over-year age-specific mortality *change* were calculated using this 16-year time series, and then applied to project future age-specific mortality rates to 2048. These projected rates were then applied to the population projections ([Section 2.1](#)) to calculate District of Squamish mortality by age cohort.

Appendix A show SLRD deaths, population and mortality rates from 2001 to 2017.

2.3 SQUAMISH RESIDENT DEATHS

Figure 2.4 shows the forecast of mortality for District residents based on applying mortality rates by age to the projected population change in the District:

Figure 2.4 District of Squamish Mortality Forecast to 2048 (number of mortalities per year)



Between 2019 and 2048, there are projected to be nearly 7,600 deaths of Squamish residents. As the population ages, the number of deaths per 1,000 residents will increase each year – from 4.8/1,000 in 2019 to 6.9/1,000 by 2029, 9.5/1,000 by 2039 and 12.2/1,000 by 2048. On average, the number of deaths among Squamish residents is projected to increase by 5.2% per year.

³ Statistics Canada Table 17-10-0085-01 (death data); BC Stats Demographic Analysis Section (population data).

2.4 DISPOSITIONS

Methods of disposition for Squamish deaths are projected using available data for the Howe Sound Local Health Area (LHA) between 2004 and 2011 (**Figure 2.5**). Based on the observed rate of change for full burial and cremains interments during that eight-year period (showing cremation increasing and full burial decreasing), a trend-based projection was prepared. Cremation as a means of disposition is capped at 90% of total from 2023 onward. **Figure 2.6** shows the projection for Squamish resident dispositions.

Figure 2.5 Howe Sound Local Health Area Methods of Disposition, 2004 to 2011

Year	Burial		Cremation	
	#	%	#	%
2004	20	20%	82	80%
2005	20	17%	95	83%
2006	27	21%	100	79%
2007	25	21%	94	79%
2008	30	24%	94	76%
2009	22	18%	99	82%
2010	19	18%	84	82%
2011	18	14%	107	86%

Figure 2.6 Squamish Resident Deaths, Method of Disposition and Expected Interments in Squamish to 2048

Year	Projected Deaths by Interment Type			Expected Interments in Squamish	
	Deaths	Burial	Cremation	Burial	Cremation
2019	101	11	90	8	27
2020	108	12	96	8	29
2021	115	12	103	8	31
2022	121	12	109	9	33
2023	129	13	116	9	35

Projected Deaths by Interment Type				Expected Interments in Squamish	
Year	Deaths	Burial	Cremation	Burial	Cremation
2024	138	14	124	10	37
2025	147	15	132	10	40
2026	157	16	142	11	43
2027	168	17	151	12	45
2028	178	18	160	12	48
2029	189	19	170	13	51
2030	201	20	181	14	54
2031	213	21	192	15	57
2032	225	22	202	16	61
2033	237	24	213	17	64
2034	248	25	224	17	67
2035	261	26	235	18	70
2036	274	27	247	19	74
2037	287	29	258	20	78
2038	300	30	270	21	81
2039	313	31	282	22	84
2040	327	33	295	23	88
2041	343	34	309	24	93
2042	356	36	321	25	96
2043	371	37	334	26	100
2044	386	39	347	27	104
2045	399	40	359	28	108
2046	415	42	374	29	112
2047	430	43	387	30	116
2048	444	44	400	31	120

2.5 INTERMENT DEMAND IN MOUNT GARIBALDI CEMETERY

Proportions of resident dispositions that are likely to require interment in the Mount Garibaldi Cemetery (MGC) are projected using historical death-to-interment ratios as a guide. Based on information received from District of Squamish staff, along with historical death data for the SLRD, Urban Systems calculated six years of historical death-to-interment ratios, and made the following assumptions for future interment need:

- **Full burial** - 70% of projected full burials will be interred in MGC
- **Cremains** - 30% of projected cremains dispositions will be interred in MGC

Assuming that MGC will offer green burial as a future option, the assumption is that 2% of projected dispositions from each of the full burial and cremains interments will shift to green burial for a total of 4%. This is a conservative estimate since the community survey indicated significant interest, but the number of respondents was low.

Future interment demand for scattering is assumed to be 5% of the total projected cremains interments. Since scattering is not currently offered at the cemetery and switching from other cremains options to scattering is unlikely, scattering interments are expected to be in addition to the forecasted interments for MGC.

Based on the above assumptions, there is projected need to accommodate approximately 2,800 interments between 2019 and 2048:

- **485** full burials
- **92** green burials
- **2,000** cremains interments (including niches and inground plots)
- **215** cremains as scattering

Figure 2.7 shows the projected interment needs in MGC over the 2019 to 2048 period.

Figure 2.7 Projected Interment Needs in Squamish, 2019-2048

Interment Service	(Historical) 2009 – 2018	2019 – 2028	2029 – 2038	2039 – 2048	30-Year Total Projected
Traditional Burials	61	93	153	239	485
Green Burials	0	7	34	51	92
Total Burials	61	100	187	290	577
Cremains	189	393	717	1105	2215
Total Cremains	189	393	717	1105	2215
Total	250	493	904	1395	2792

2.6 INTERMENT SERVICES OFFERED

Squamish currently offers full burial and cremation inground plots. Squamish Funeral Chapel (SFC) offers columbarium niches for cremains and memorial book inscriptions located within the cemetery as per a 2004 license agreement between SFC and the District. As part of the cemetery improvements, green burial and scattering are proposed as new interment options.

Future interments by product type are based on available historical data and derived ratios based on this data, along with available data from other cemeteries in the region. Projections are based on an assumption that MGC will begin to offer scattering in 2023 and green burial in 2024. If adopted as a method of interment, green burial is expected to increase in demand over time; it is therefore phased in over four years, drawing increasingly from full burial and cremains interments to reach a 4% share as discussed in [Section 2.5](#). **Figure 2.8** provides the assumed demand in 10-year increments over a 30-year time horizon.

Figure 2.8 MGC Projected Interment Summary, 2019-2048

Interment Service	2019-2028	2029-2038	2039-2048	30-Year Total
Full burials	93	153	239	485
Green burials	7	34	51	92
Total Burials	100	187	290	577
Cremains in cremains plot	147	257	398	802
Cremains in full burial plot	95	168	255	518
Cremains in niche	124	218	338	680
Scattering	29	76	110	215
Total Cremains	395	719	1101	2215

Figure 2.9 shows the distribution of interment demand by type as proportions of total interment demand.

Figure 2.9 MGC Projected Interment Distribution as Proportion of Total Interments 2019-2048

Interment Service	2019-2028	2029-2038	2039-2048	30-Year Total
Full burials	93%	82%	82%	84%
Green burials	7%	18%	18%	16%
Total Burials	20%	21%	21%	21%
Cremains in cremains plot	37%	36%	36%	36%
Cremains in full burial plot	24%	23%	23%	23%
Cremains in niche	31%	30%	31%	31%
Scattering	7%	11%	10%	10%
Total Cremains	80%	79%	79%	79%



3 CEMETERY CAPACITY AND FINANCIAL ANALYSIS

3.1 INTRODUCTION

The financial analysis estimates future revenue and costs to project cash flow. The primary goal of the financial analysis is to identify the anticipated timing and extent of cash flow shortfalls and the level of subsidy the District is providing. This can offer direction on when borrowing (internal or external) may be needed and it informs proposed adjustments to fees. This analysis reflects a 30-year period starting in 2019.

Three funding models were presented to Council in January 2020 as shown in **Figure 3.1**. Council directed staff to proceed with Scenario 3, a 75% fee increase for residents. The financial analysis provided here is based on a 75% fee increase and reflects confirmed capital costs and anticipated timing.

Figure 3.1 Financial Scenarios

Scenario 1 – Status Quo	Scenario 2 – 25% Fee Increase	Scenario 3 – 75% Fee Increase
- Does not include expansion or capital upgrades 2% annual fee increase to eliminate District subsidy of operating costs after 22 years 29% (\$26,000/year) annual operating cost subsidization averaged from 2019-2040	- Does not include expansion or capital upgrades - Raise fees 25% initially, followed by 2% annually to eliminate District subsidy of operating costs more quickly, after 16 years 17% (\$11,000/year) annual operating cost subsidization averaged from 2019-2040	- Raise fees 75% initially, followed by 2% annually to eliminate District subsidy of operating costs within 10 years and to fund some capital improvements 9% (\$5,000/year) annual operating cost subsidization until 2028 - Subsidization required in years with capital improvements

3.2 CEMETERY CAPACITY

Figure 3.2 shows the current available capacity at MGC and identifies increased capacity of the proposed cemetery expansion, by phase, based on projected needs. Improvements and capacity are expected to be added over three phases, in 2022, 2023, and 2033 based on the improvements to the existing cemetery required in the short-term and expansion to meet needs in subsequent years. These timelines allow services to be available in advance of projected needs by at least one year (e.g., capital improvements will be needed in 2023 to support the interment demands from 2024-2033. Cemetery improvements (excluding columbarium walls) are expected to add capacity for 1,200 interments. The columbarium wall that is operated by SFC will provide 884 niches at full build-out. Of this maximum capacity, 758 niches are still available as shown in the table below.

Interment capacity provided in **Figure 3.2** is based on following assumptions:

- Each traditional burial plot will accommodate one full interment
- Each green burial plot will accommodate one full interment
- Each cremation plot will accommodate one set of cremains
- 75% of columbarium niches will accommodate two sets of cremains while 25% will accommodate one set of cremains
- Of inground cremains interments, 60% will be interred in a cremation plot and 40% will be interred in an occupied full burial plot

Figure 3.2 Mount Garibaldi Cemetery Actual and Future Capacity

Year	Service Type	Available Plot & Niche Capacity	Plot & Niche Expansion Quantity	Interment Capacity ¹
Currently Available (2019)	Traditional Burial Plot	49		49
	Cremains Plots	423		423
	Columbarium Niches ¹	758		1327
	Current Total	1230		1799
PHASE 1				
2022 – 2023	Traditional Burial Plot		0	0
	Green Burial Plot		0	0
	Cremains Plots		0	0
	Columbarium Niches		0	0
	Scattering		25	25
	Total Added		25	25
PHASE 2				
2024 – 2033	Traditional Burial Plot		178	178
	Green Burial Plot		26	26
	Cremains Plots		180	180
	Columbarium Niches		0	0
	Scattering		75	75
	Total Added		459	459
PHASE 3				
2034 – 2048	Traditional Burial Plot		282	282
	Green Burial Plot		74	74
	Cremains Plots		240	240
	Columbarium Niches		0	0
	Scattering		125	125
	Total Added		721	721
	Totals	1230	1205	3004
	Total Additional²		1205	1205

¹ Available niche capacity reflects maximum availability at full build-out of columbarium walls as per the license agreement with SFC assuming 25% of niches will accommodate one set of cremains and 75% will accommodate two sets of cremains.

² Total additional interments do not include interments of cremains on occupied burial plots because no new spaces are required to accommodate these.

Figures 3.3 and 3.4 show the current capacity of the cemetery (interments) and the capacity that will be created by the proposed upgrades.

Figure 3.3 Mount Garibaldi Cemetery Interment Capacity

Interment Type	Capacity Before Upgrades	Capacity After Upgrades
Full Burial	5 Years	30+ Years
Green Burial	0 Years	30+ Years
Cremains Plot	20 Years	30+ Years
Columbarium Niche ¹	30+ Years	30+ Years
Scattering	0 Years	30+ Years

¹ Reflects maximum capacity with full build-out under current license agreement with SFC.

Figure 3.4 Mount Garibaldi Summary of Available and Planned Spaces

Interment Type	Available	Planned
Full Burial	49	460
Green Burial	0	100
Cremains Plot	423	420
Columbarium Niche	758	0
Scattering	0	225
Total	1230	1205

Available and planned spaces differ from projected interment demand over 30 years because a portion of cremains are expected to be interred on occupied burial plots, which does not result in the need for any additional spaces. With a capacity of 884 niches in the entire proposed columbaria, there are more columbarium niches available at build-out of the SFC contract than will be required over the next 30 years. Proposed capital improvements result in slightly higher plot counts than are required as the cemetery is designed to maximize new plots in each area.

3.3 CEMETERY REVENUE

Revenues are achieved from the following sources:

- Right of interment sales (license fees)
- Interment fees (open/close charged at the time of interment)
- Additional fees (liners, marker fees, vase installation/purchase)
- Portion of sales from columbarium niche right of interment, niche plaque, and memorial book inscription from SFC

Perpetual care fund (PCF) contributions and interest earned on the PCF are not considered revenue. The PCF contributions are held in trust, but the District can choose to use the interest earned towards annual operating and maintenance. The District currently retains the interest earned in the PCF and expects to continue to do so.

Existing Rates

Figures 3.5 – 3.8 provide a summary of fees per interment type for both 2018 and as proposed for 2019. **Figure 3.9** provides the percentage change in total fees from 2018 to proposed 2019 fees. Detailed descriptions and rationale for proposed fees are provided below the figures.

Figure 3.5 Mount Garibaldi 2018 Resident Rates

Type of Interment	Right of Interment	PCF	Open/Close	Liner ¹	Total
Adult Traditional Burial Plot	\$638	\$213	\$1,550	\$250	\$2,650
Adult Green Burial Plot	n/a	n/a	n/a	n/a	n/a
Child Burial Plot	\$413	\$138	\$1,440	\$160	\$2,150
Infant Burial Plot	\$206	\$69	\$1,300	\$147	\$1,722
Cremains Plot	\$244	\$81	\$385	\$95	\$805
Cremains on Occupied Traditional Burial Plot	\$0	\$0	\$385	\$95	\$480
Scattering	n/a	n/a	n/a	n/a	n/a

¹ Full burials in Section L require payment of cement liner (\$670) instead of listed cost as it is already installed.

Figure 3.6 Mount Garibaldi 2018 Non-Resident Rates

Type of Interment	Right of Interment	PCF	Open/Close	Liner ¹	Total
Adult Traditional Burial Plot	\$4,050	\$1,350	\$1,550	\$250	\$7,200
Adult Green Burial Plot	n/a	n/a	n/a	n/a	n/a
Child Burial Plot	\$825	\$275	\$1,440	\$160	\$2,700
Infant Burial Plot	\$413	\$138	\$1,300	\$147	\$1,997
Cremains Plot	\$1,500	\$500	\$385	\$95	\$2,480
Cremains on Occupied Traditional Burial Plot	\$0	\$0	\$385	\$95	\$480
Scattering	n/a	n/a	n/a	n/a	n/a

¹ Full burials in Section L require payment of cement liner (\$670) instead of listed cost as it is already installed.

Figure 3.7 Mount Garibaldi Proposed 2019 Resident Rates

Type of Interment	Right of Interment	PCF	Open/Close	Liner ¹	Total
Adult Traditional Burial Plot	\$1,116	\$368	\$2,713	\$275	\$4,471
Adult Green Burial Plot	\$1,116	\$368	\$2,100	\$0	\$3,584
Child Burial Plot	\$722	\$238	\$2,520	\$160	\$3,640
Infant Burial Plot	\$361	\$119	\$2,275	\$147	\$2,902
Cremains Plot	\$427	\$141	\$674	\$55	\$1,296
Cremains on Occupied Traditional Burial Plot	\$0	\$0	\$674	\$55	\$729
Scattering	\$0	\$132	\$400	\$0	\$532

¹ Full burials in Section L require payment of cement liner (\$670) instead of listed cost as it is already installed.

Figure 3.8 Mount Garibaldi Proposed 2019 Non-Resident Rates

Type of Interment	Right of Interment	PCF	Open/Close	Liner ¹	Total
Adult Traditional Burial Plot	\$4,050	\$1,337	\$2,713	\$275	\$8,374
Adult Green Burial Plot	\$4,050	\$1,337	\$2,100	\$0	\$7,487
Child Burial Plot	\$825	\$272	\$2,520	\$160	\$3,777
Infant Burial Plot	\$413	\$136	\$2,275	\$147	\$2,971
Cremains Plot	\$1,500	\$495	\$674	\$55	\$2,724
Cremains on Occupied Traditional Burial Plot	\$0	\$0	\$674	\$55	\$729
Scattering	\$0	\$132	\$400	\$0	\$532

¹ Full burials in Section L require payment of cement liner (\$670) instead of listed cost as it is already installed.

Figure 3.9 Total Proposed Percentage Change in Mount Garibaldi Rates

Type of Interment	Resident	Non-Resident
Adult Traditional Burial Plot	69%	16%
Adult Green Burial Plot (New)	n/a	n/a
Child Burial Plot	69%	40%
Infant Burial Plot	69%	49%
Cremains Plot	61%	10%
Cremains on Occupied Traditional Burial Plot	52%	52%
Scattering (New)	n/a	n/a



Fees Review

Squamish's right of interment fees vary by residency status and interment type. Green burial and scattering are not currently offered but are proposed in the improvements. The District receives 5% of columbarium niche sales (right of interment fees) from SFC as per the license agreement.

Squamish's interment (open/close) fees apply to each interment type except for cremains interred into the niche wall as this is conducted by SFC. Interment fees remain constant regardless of residency status.

Each full burial or interment of cremains in the ground requires purchase of a liner. Fees are levied for markers, memorials, and vase purchases and installations. For the purposes of the financial analysis, only marker sales are included in the revenue projections. A marker sale is assumed for 90% of interments based on discussions with the District. The marker sales purchased are assumed to be single markers except where cremains are interred on occupied burial plots, where a double marker is assumed. The revenue associated with liners is linked to the cost to the District and memorials and vases are purchased infrequently so these items are not included in the financial model.

The District receives 5% of niche plaque and memorial plaque sales from SFC as per the license agreement.

Proposed Changes

- Increase all resident right of interment fees by 75%
- Increase all interment fees (applies to resident and non-resident) by 75%
- Set right of interment fee for resident and non-resident green burial to align with the proposed full burial adult fee. The consumer saves costs through a lower interment fee and no need to purchase a liner or monument
- Set interment fee for green burial at \$2,100 to reflect lower labour fees associated with green burial
- Set interment fee for scattering at \$400. This fee is based on the relative cost for MGCs other cremains options. It is common to not charge a right of interment fee for scattering and only an interment fee. Scattering will present a cost saving to the consumer compared to other cremains options because there is no right of interment and the cost of labour for interment is lower

Perpetual Care Fund Review

The perpetual care fund is set up for the care and maintenance of the cemetery for the time when operating revenues will no longer be available. This is a requirement of the *Cemetery and Funeral Services Act* in B.C.

Perpetual care fund fees in Squamish are charged on the right of interment for full burial and cremation plots and on the marker fee. As per the contract with SFC, Squamish receives perpetual care fees for columbarium niches as a percentage of sale price (right of interment) and as a dollar value on each niche and memorial plaque sale.

PCF allowances are charged or collected as follows:

- Full burial and cremains plot sales **33%**
- Columbarium niche **10%**
- Marker Fee **33%**
- Niche Plaque **\$10**
- Memorial Book Plaque **\$10**

The balance in the District's perpetual care fund was \$235,718 as of December 31, 2018.

Proposed Changes

- Set PCF allowance for new green burial option at 33% to align with existing allowance for full burial
- Set PCF allowance for new scattering option at 33% to be calculated on the interment fee since no right of interment applies. This aligns with the allowance for other inground burial interments

Projected Revenue

Based on the projected interments, interment distribution, and proposed rates (including a 2% annual escalation in fees) projected gross revenues over the next 30 years are shown in **Figure 3.10**:

Figure 3.10 Projected Revenue, 2019-2048

Revenue Source	30 Year Total
Rights of Interment Revenue	\$1,478,000
Interment Revenues	\$3,600,000
Marker, Niche and Plaque Revenues	\$450,000
Total Revenues (Gross)	\$5,528,000

3.4 CEMETERY COSTS

Squamish incurs two types of costs – capital costs and operations / maintenance costs.

Capital Costs

Capital costs are one-time costs associated with expanding or improving cemetery infrastructure.

Total capital costs to improve and expand the cemetery to meet interment demand for the next 30 years is projected to be \$2.0 million before annual cost escalation ([Section 4.4](#)).

Capital costs are allocated to the year improvements will be required to maintain capacity to meet projected demand.

Operating Costs

Operating costs associated with day-to-day operations of the cemetery fall within two categories - interment-related costs and general operations and maintenance costs. Interment-related costs include salary, equipment and materials related to burials. General operations and maintenance costs include salaries, equipment, materials and utilities related to site operations and maintenance.

For the cash flow model, the interment-related costs were calculated based on the average actual costs for these budget line items from 2015-2018. As no information is available to indicate probable expense increases commensurate with each interment, an additional 1% increase over the typical 2% annual cost escalation is applied for a total of 3%. The average annual operating costs and projected interment-associated expenditures over the next 30 years are provided in **Figure 3.11**.

Figure 3.11 Interment-Related Expenditures

Category	Average Interment Related Operating Costs (Annual)	Projected Interment Related Operating Costs (30 years)
Salaries - Cemetery Services	\$8,600	\$420,900
Equipment Allocations	\$2,500	\$124,000
Materials	\$800	\$37,000
Materials for Sale	\$800	\$40,300
Total Interment-Associated Expenditures	\$12,700	\$622,200

The general operations and maintenance costs are based on the average actual costs for these budget line items from 2015-2018. Any anomalies associated with one-off costs not anticipated to reoccur are excluded. A cost escalation of 2% is applied annually to ongoing general operations and maintenance costs.

General operations and maintenance costs will increase when the cemetery expands in size. Phase 1 does not include any additional area so no increases in costs are applied. Phase 2 represents an expansion of approximately 30% of the size of the existing cemetery, and Phase 2 and 3 together represent an expansion of approximately 55% of the existing cemetery. Costs are increased accordingly. The average annual general operations and maintenance costs and projected general operations and maintenance costs of expenditures over the next 30 years are provided in **Figure 3.12**.

Figure 3.12 General Operations & Maintenance Expenditures

Category	Average General Operating Costs (Annual)	Projected General Operating Costs (30 years)
Salaries - Cemetery Maintenance	\$31,000	\$1,814,000
Equipment Allocations	\$11,000	\$666,000
Materials	\$6,000	\$335,000
Utilities	\$2,000	\$98,000
Total Operations & Maintenance Expenditures	\$50,000	\$2,913,000

3.5 FINANCIAL PROJECTIONS

Revenue Projections

- Gross revenues are projected to be approximately \$52,500 in 2019 and are projected to increase over time as interments increase. **Figure 3.13** provides a summary of projected revenue.

Figure 3.13 Mount Garibaldi Projected Revenue

Revenue Source	2019-2028	2029-2038	2039-2048	30-Year Total
Rights of Interment Revenue	\$202,730	\$443,545	\$831,384	\$1,477,659
Interment Revenues	\$490,970	\$1,080,739	\$2,028,692	\$3,600,401
Marker, Niche Plaques & Memorial Plaques	\$64,351	\$135,264	\$250,750	\$450,365
Total Revenues (Gross)	\$758,051	\$1,659,549	\$3,110,826	\$5,528,425
Avg. Per Year	\$75,805	\$165,955	\$311,083	\$184,281

Perpetual Care Fund

The perpetual care fund (PCF) had a balance of \$235,718 as of January 1, 2019. The fund will grow over time to varying degrees, dependent on three factors:

- Prices charged for rights of interment
- Proportional allocation of fees to the PCF
- Earnings on the PCF

The PCF allocations are as follows:

- Full burial, green burial and cremation plot sales **33%**
- Marker permit fee **33%**
- Columbarium niche **10%**
- Niche Plaque **\$10**
- Memorial Book Plaque **\$10**

The PCF projections include a 33% PCF charged on the proposed interment fee for scattering since a right of interment is not charged. This will provide for the ongoing care and maintenance of the scattering garden.

Perpetual Care Fund Projections

In the financial model, the interest rate is assumed to be 2.4% annually based on the District's interest rates on long-term investments.

- The projected PCF fund balance at the end of 30 years (2048) based on the existing fund balance when interest earned is retained in the fund is \$1,352,811. **Figure 3.14** provides a summary of projected contributions and interest earned.

Figure 3.14 2019-2048 Perpetual Care Fund Projections

Perpetual Care Fund	2019-2028	2029-2038	2039-2048	30-Year Total
Opening Balance	\$235,718	\$400,124	\$733,252	-
Contributions	\$90,300	\$200,609	\$374,750	\$665,659
Interest	\$74,106	\$132,519	\$244,809	\$451,434
Total Contributions and Interest	\$164,406	\$333,128	\$619,559	\$1,117,093
Balance	\$400,124	\$733,252	\$1,352,811	-
Avg. Collected/Earned Per Year	\$16,441	\$33,313	\$61,956	\$37,236

Cash Flow Projections

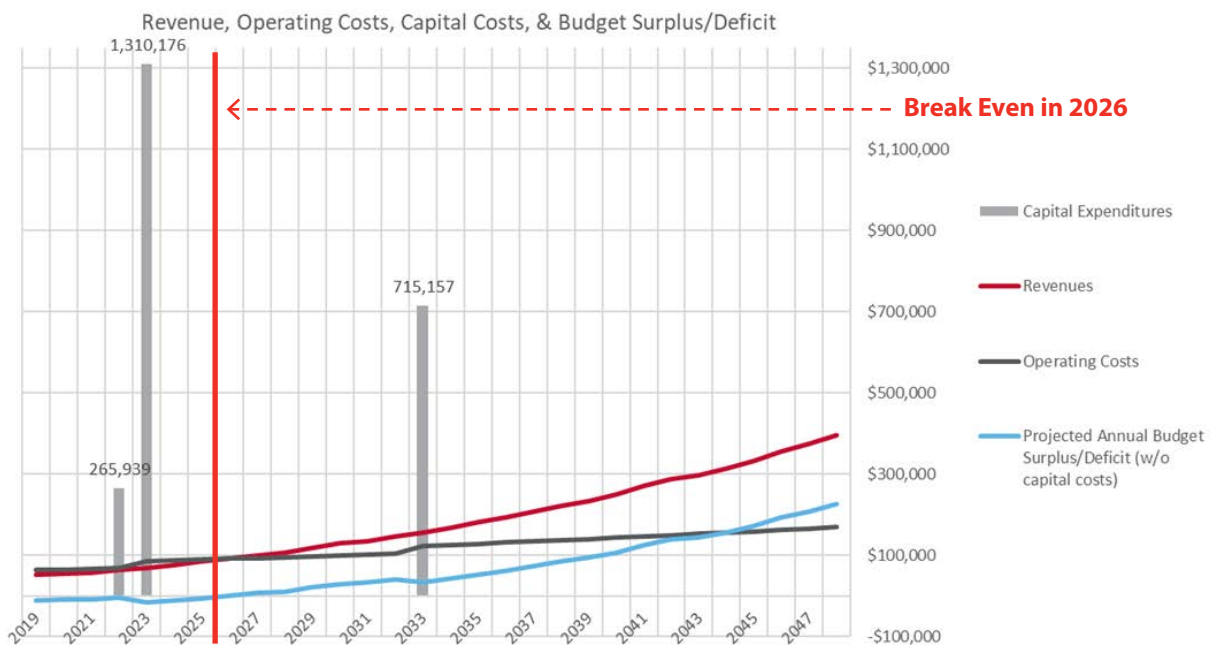
Figures 3.15 and **3.16** show the annual projection of revenues, operating and capital costs, and the annual surplus/deficit. PCF interest has been retained in the PCF fund to reflect Squamish's current practice, so it is not included in the cash flow projections. The capital expenditures are based on an annual escalation factor of 2%. Note the Phase 2 capital expenditure includes \$165,000 (before escalation) for a washroom building that is considered optional at this time.

Figure 3.15 2019-2048 Cash Flow Projections

Year	Revenues	Operating Costs	Capital Costs	Surplus/ Deficit w/ Capital Expenditures	Surplus/ Deficit w/o Capital Expenditures	Subsidy Required - Op + Cap (%)	Subsidy Required - Op (%)
2019	52,510	63,610	0	-11,100	-11,100	17%	17%
2020	55,830	65,013	0	-9,183	-9,183	14%	14%
2021	57,016	66,448	0	-9,432	-9,432	14%	14%
2022	64,734	67,915	265,939	-269,120	-3,181	81%	5%
2023	69,149	85,825	1,310,176	-1,326,852	-16,676	95%	19%
2024	76,562	87,689	0	-11,127	-11,127	13%	13%
2025	84,295	89,594	0	-5,299	-5,299	6%	6%
2026	92,246	91,543	0	704	704	0%	0%
2027	100,278	93,534	0	6,744	6,744	0%	0%
2028	105,431	95,571	0	9,861	9,861	0%	0%
2029	119,060	97,653	0	21,408	21,408	0%	0%
2030	129,190	99,782	0	29,409	29,409	0%	0%
2031	135,105	101,958	0	33,146	33,146	0%	0%
2032	146,073	104,184	0	41,889	41,889	0%	0%
2033	156,828	123,128	715,157	-681,457	33,700	81%	0%
2034	168,876	125,788	0	43,087	43,087	0%	0%
2035	181,456	128,508	0	52,949	52,949	0%	0%
2036	194,138	131,288	0	62,851	62,851	0%	0%
2037	206,923	134,130	0	72,794	72,794	0%	0%
2038	221,898	137,035	0	84,863	84,863	0%	0%
2039	234,764	140,005	0	94,758	94,758	0%	0%
2040	248,893	143,042	0	105,851	105,851	0%	0%
2041	270,748	146,146	0	124,602	124,602	0%	0%
2042	287,941	149,319	0	138,622	138,622	0%	0%
2043	297,299	152,564	0	144,735	144,735	0%	0%
2044	312,947	155,881	0	157,066	157,066	0%	0%
2045	331,441	159,272	0	172,168	172,168	0%	0%
2046	356,289	162,740	0	193,549	193,549	0%	0%

Year	Revenues	Operating Costs	Capital Costs	Surplus/Deficit w/ Capital Expenditures	Surplus/Deficit w/o Capital Expenditures	Subsidy Required - Op + Cap (%)	Subsidy Required - Op (%)
2047	374,885	166,285	0	208,600	208,600	0%	0%
2048	395,620	169,910	0	225,709	225,709	0%	0%
Total	5,528,425	3,535,359	2,291,272	-298,206	1,993,066		

Figure 3.16 2019-2048 Cash Flow Projections Graph



3.6 FINANCIAL SUMMARY

The cemetery is not currently self-sufficient and Squamish's resident right of interment rates are low compared to cemeteries in the Lower Mainland. A 75% increase in right of interment fees for residents and 75% increase in interment fees for residents and non-residents is proposed to eliminate the District subsidy of operating costs within 10 years, and to fund a portion of the anticipated capital costs over the next 30 years.



4 CEMETERY CONCEPT PLANS

4.1 SITE INVENTORY AND ANALYSIS

A site inventory is illustrated on **Map 1**. The following is an overview of the site along with an analysis of the associated opportunities and considerations:

Location / Feature	Description	Opportunities / Considerations
Site Entry	Entry consists of a stone picnic table, regulatory sign, and water tap	Consolidation and upgrading of signage and gathering amenities
Old Entry Gate	Historic gate is a secondary entry with no parking	Historic gate could serve as a precedent for design of a new gate
Perimeter Fence and Gate	West side has a chain link fence and gate, chain link fence on south side too	A more attractive fence and gate Fences will be needed on north and east sides with cemetery development
Parking	Parking lot is uneven gravel surface wider than necessary Angle parking along Government Road interferes with greenway trail	Define parking lot better Add some paving Provide more parking for expanded cemetery
Oldest Interment Area	Roots of trees are interfering with some monuments and interment plots Attractive canopy of beech trees	Restoration of some monuments and plots Establish similar tree canopy in new interment areas
Newer Interment Areas	Fewer trees Ornamental trees, shrubs and raised planting beds add character along north/south path	Raised planters could serve as scattering gardens
Columbarium and Memory Book Area	Major expansion planned	Retain space of expansion
Perimeter Trees	Douglas-fir perimeter trees north of cemetery's entrance add to the character Giant sequoia trees south of entrance allow for views but do not add as much character	Continue retention or planting of large trees around the cemetery perimeter
Veteran Douglas-fir	Clump of veteran trees are of major environmental and aesthetic value	Take measures to protect these trees

Location / Feature	Description	Opportunities / Considerations
Memorial Benches	Variety of bench types Some benches appear more personal/private than public	Common type of bench located to serve the public
Maintenance Yard	Yard blocks opportunity to continue road, yard is too small to support a larger cemetery	Larger maintenance yard and building
South Access Road	Road provides a secondary cemetery exit	Road could be an exit for visitors and/or an access to a new maintenance yard
Forested Area	Second growth trees and minimal understory	Merchantable timber could help to support capital works
		Bird nest survey could be required prior to clearing
		Wildlife Danger Tree Assessment with extent beyond the limit of work could be required prior to clearing and construction activities Stand wind-firmness assessment and pretreatment could be required to minimize loss of newly exposed retained trees to wind events
Mountain Bike Trail	Mountain bike trail "Zombie Crawl" runs through the cemetery site	Consult with user group to reroute mountain bike trail as needed
Cheekeye Fan	Site location results in many buried rocks	Need to excavate and clear rocks from large areas at a time
		Rocks could be used creatively in the cemetery
Water Source	Well at the edge of the property is currently used for irrigation	Water can be used to expand the irrigation system
Types of Interment	Full burial, cremation plots, columbaria	Addition of scattering gardens and green burial areas
Views	Distant mountain views, especially to the southwest	Retain and frame views

4.2 GUIDING PRINCIPLES AND PROGRAM

The following guiding principles are based on retaining and enhancing the positive aspects of the cemetery, and building on the existing features to attract more use and to provide a better experience to those interring or visiting their loved ones:

- Improve the edges and the entry experience so the cemetery feels more welcoming
- Provide better accessibility, e.g., for those with mobility challenges, high heels, strollers
- Retain and plant more trees to keep the natural, shaded character
- Retain and frame the views
- Upgrade the existing area first so people are more attracted to the cemetery
- Expand the range of interment services

The following are potential new interment services to consider:

- Scattering areas
- Provide different sections, e.g., area with upright monuments for those willing to pay more for that, family plots that could include full and cremains burials, and continue to provide space for organizations
- Space for family monuments with multiple niches
- Variations of green burial, including green approach with individual monuments

The following are potential site features to consider:

- Benches throughout the cemetery in small nodes, especially near scattering areas
- Paths through the forest for walking meditation
- Paved paths to key areas
- Replace chainlink fence with something better
- Improve the entry
- Provide route for hearse to enter and exit easily
- Consider lights – maybe solar, maybe to 9pm and very subtle after that, maybe motion-activated
- Consider ways to share historic information, e.g., kiosk, digital chips in monuments, online
- Roofed shelter for small services, gatherings or sitting in the rain (no walls) – would need regulations regarding music, alcohol, noise, rent, etc.

4.3 CONCEPT PLAN OPTIONS

The concept plan options are based on the long-term development of the cemetery, recognizing that there is significantly more space available for cemetery development than will be needed in the next 25 to 30 years. Having a long-term plan will enable the District to develop the site in phases, allowing for a level of certainty and flexibility related to future needs.

Two concept plan options provide variations in site circulation and design (**Appendix C**). The table below describes the characteristics of each option. These options are for full cemetery build-out. At this level, individual plots are not shown as there is ample space to locate them as needed.

Feature	Option A	Option B
1. Road system	Two-way paved road off the parking lot to a one-way compacted gravel central loop	One-way paved U-road connecting main entrance and secondary exit
2. Parking	Paved angle parking lot at entry Parallel parking in pullouts along loop road	Angle parking lot at entry with paved central access and H/C spaces, compacted gravel in parking spaces Angle parking along the road near secondary exit, gravel parking spaces
3. Pathway	Perimeter loop gravel path begins and ends near entry parking lot	Internal loop gravel trail intersecting roadway and connecting tree clusters
4. Main seating area	New seating area near entrance	Seating space under roofed shelter
5. Picnic table	Relocation of picnic table to near main seating area	Picnic table to remain in same location near entry
6. Benches	Benches along the path and near scattering garden	Benches along the path
7. Entrance gate	Arch over entrance gate inspired by existing arch in northern entrance	Low gate relating to new metal fence
8. Vegetation buffer	Retain forest buffer along the north, east and south perimeter	Retain / add forest trees and thin understory vegetation along the north, east and south perimeter
9. Tree planting	Individual trees randomly planted similar to north part of existing cemetery	Maintain and/or plant clusters of trees with some native understory

10. Scattering gardens	Scattering garden as the end of a visual axis from the entrance road	Scattering garden in the centre of the cemetery
11. Roofed shelter	No shelter on this option	Shelter near the scattering garden
12. Entry sign	Keep existing sign in the same location near the entrance	New sign kiosk with more information approximately in the same location
13. Fence	Split rail wood fence around the entire perimeter of the cemetery, could have added wire mesh if needed	Decorative metal fence on the west frontage of the cemetery, simple metal / mesh fence around the other three sides

4.4 PREFERRED CONCEPT PLAN

The preferred concept plan was generated through workshops with City staff (**Map 2**). It is based mostly on Option A, with some variations. The following are the features of the preferred concept plan.

Feature	Description
Road system	Two-way paved road off the parking lot to a one-way central loop, south road extended into the cemetery to meet the new loop (for service access)
Parking	Paved 90° angle parking lot at entry Angle parking at 60° in pockets along loop road
Pathway	Perimeter loop gravel path begins and ends near entry parking lot Pathway is 3 m wide to accommodate service access during Phases 2 and 3
Main seating area	New seating area near parking lot between existing and new cemetery areas
Picnic table / kiosk	Addition of a new picnic table and sign kiosk across from main seating area
Benches	Benches along the path and near scattering garden

Feature	Description
Entrance gate	Arch over entrance gate inspired by existing arch at northern entrance
Vegetation buffer	Retain forest buffer along the north, east and south perimeters, removing danger and unhealthy trees as needed and planting new forest and understory vegetation as needed
Tree planting	Retain clusters of suitable trees and add Individual trees randomly planted similar to north part of existing cemetery
Scattering garden	Scattering garden in a grove at the end of a visual axis from the entrance road, circle of trees with scattering on forest-like surface below
Structure	Structure in scattering grove (no solid roof)
Fence	Split rail wood fence on the west perimeter, post and wire on north and south perimeters
Cemetery services	Full burial central to new areas, green burial east of maintenance area to become a forest grove, cremation plots along new road extension and in central location
Maintenance yard	New fenced maintenance yard off service road, includes a heated maintenance building, potential for washrooms accessible to staff and the public in the future

The preferred concept plan shows the proposed plot layout to address needs within the first three phases – approximately 25 to 30 years. Plots beyond that time are not shown because changes in cemetery services and interests could change the interment needs.

A fence is not indicated along the east perimeter of the cemetery. This is because the edge of Phase 3 will be temporary. Installing a fence along the property line is not practical until more of the forest is cleared. If needed, a simple, temporary fence with wood posts and wire could be installed.

The washroom building for Phase 2 is optional. This item is costly as it requires installation of a significant length of sanitary sewer. District staff put a porta-potty at the cemetery in the summer and it is meeting needs to date.

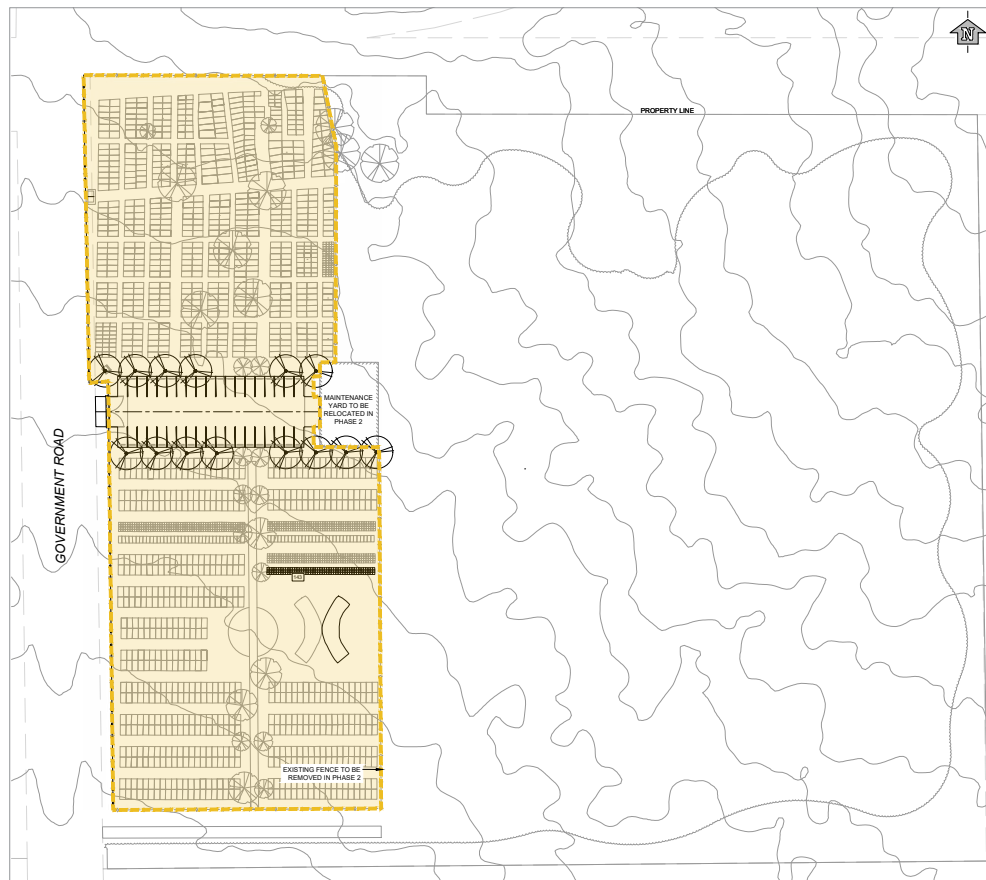


4.5 PHASING PLAN AND COST ESTIMATE

Three phases of cemetery improvement and expansion are proposed based on the projection of needs (see graphics below). The phases are planned to minimize the cost of new construction and the area requiring maintenance. **Appendix D** provides a full cost estimate.

The following is a summary estimate of capital costs for the first three phases, to be built in 2022, 2023, and 2033 to meet needs for the next 30 or so years. Beyond that, it is difficult to project demand. The cemetery has space to meet the demand for many more years beyond these phases. All full burial areas are planned to be pre-excavated to a depth of 1.8 metres to remove the large boulders that are common in this location.

Phase 1



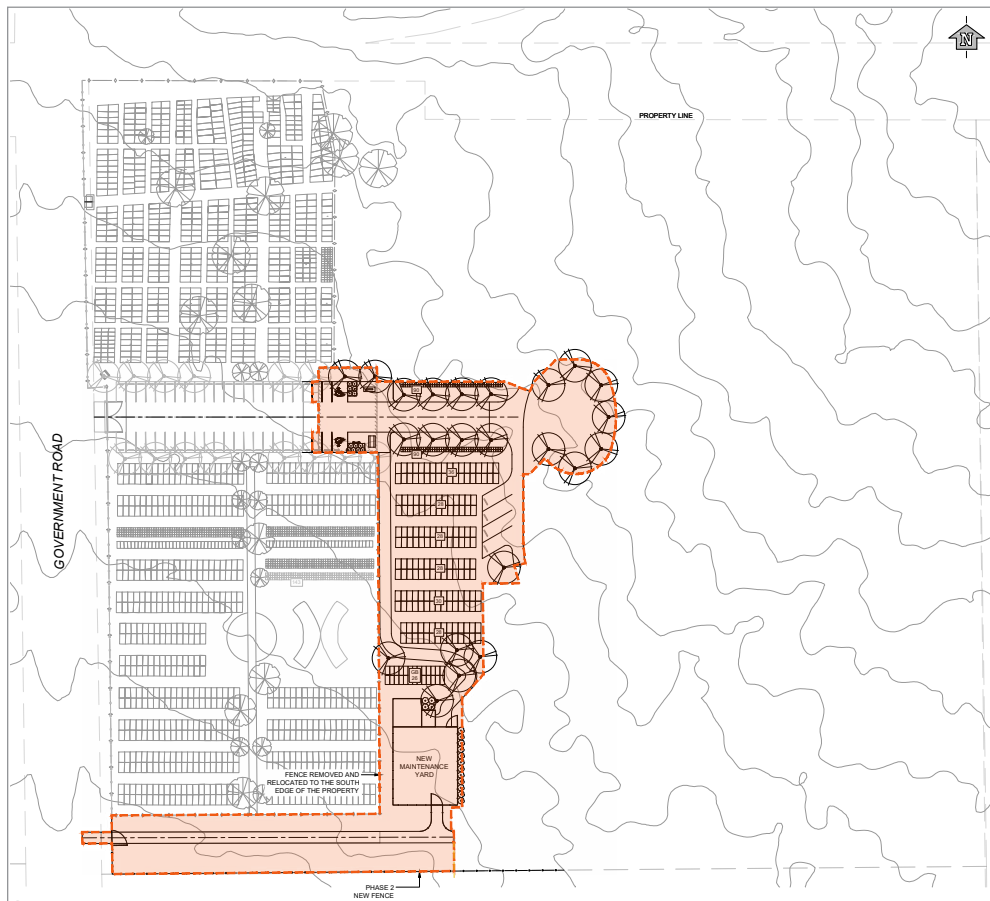
Construction focuses mainly on upgrading the existing developed part of the cemetery and includes the following:

- paving the parking lot, and adding paint lines and wheel stops
- tree planting adjacent to the parking lot
- replacement of the west perimeter fence with a split rail fence
- a new entrance feature
- refurbishing the historic gate
- restoration of monuments in the north west area where there are cracked curbs
- scattering garden markers in the raised planting beds in the centre of the south portion of the cemetery

During this phase, there will be sufficient capacity for interments with the addition of cremation plots in Block O. There is also potential for green burial in the row south of Block O, and scattering with markers introduced into the raised planting beds.

Approximate cost: \$251,000

Phase 2

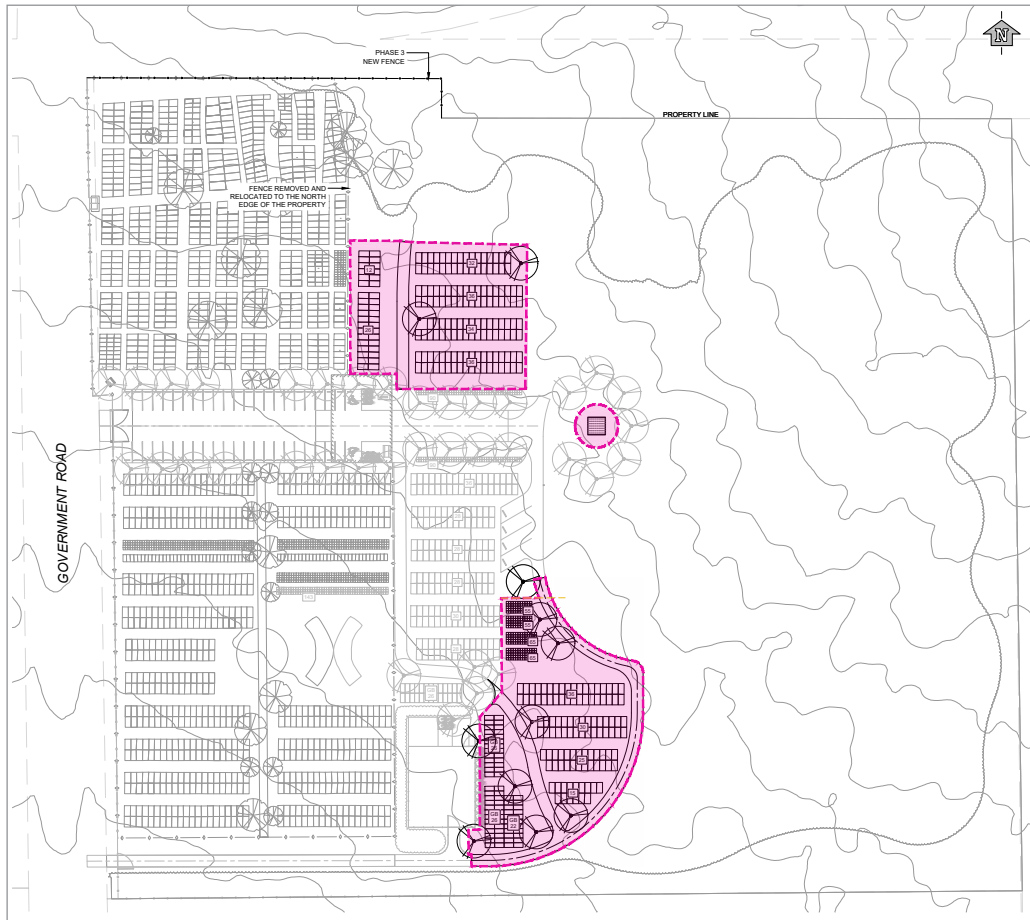


This phase extends the south portion of the cemetery to the east, and includes the following:

- relocating the maintenance yard to the south, with a perimeter fence and heated maintenance building with an equipment bay (for a backhoe or similar) and additional storage
- extending the two-way portion of the new paved road, with granular surface hammerheads at the future loop
- new seating areas on both sides of the access road with concrete paving, a long bench, new picnic table, new sign kiosk, and shrub planting beds
- part of the new scattering garden
- a service path from the seating area to the maintenance area
- tree planting along the new road extension, for the scattering garden, and near cemetery plots
- space for interments including full burial, cremation plots, and green burial

Approximate cost: \$1,210,000 of which \$165,000 is for the washroom building

Phase 3



This phase extends the north portion of the cemetery to the east, and includes the following:

- extension of the perimeter service path
- more perimeter fence
- tree planting
- a structure in the scattering garden
- space for interments including full burial, cremation plots, and green burial

Approximate cost: \$542,000

These three phases, providing capacity for over 30 years, will occupy less than one-third of the undeveloped part of the cemetery site.

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5 IMPLEMENTATION PLAN

5.1 SERVICE DELIVERY

Responsibilities for planning, managing, and operating the cemetery are currently spread across several departments:

- The Director of Public Works oversees operations, and an Engineering Assistant administers the cemetery including sales and record-keeping
- Parks Operations conducts maintenance and interments
- Planning provides input on capital projects and long-range planning

Because there have been relatively few interments and a small group of District staff have been involved, communication among staff has been good and operations have run relatively smoothly; however, record-keeping would benefit from improvements.

As use of the cemetery increases with a growing population, and assuming that fees will increase, there will be expectations for a higher level of service. The following are some suggestions for improving service delivery in the future:

- Improve software and systems for sales and record-keeping – a cemetery this size will be best served by adapting District systems for finances and asset management that are already in place to incorporate cemetery services
- Assign one person, with a backup for support, to cemetery administration, and provide training to this person in cemetery management, customer relations, and cemetery administration

- Confirm the roles of the Engineering and Parks Operations departments in operations and maintenance
- Confirm a planner to provide support and liaison with other departments on cemetery planning
- Confirm that the Engineering Department Capital Projects Management team will oversee and manage capital projects with input from the Public Works Department Prepare an operations and management manual that clarifies roles, responsibilities, and tasks
- As new cemetery services are introduced, work with local funeral homes to coordinate new processes and procedures

5.2 ACTION ITEMS

Once the Mount Garibaldi Master Plan is approved by Council, implementation tasks will include the following:

- Adjustments to service delivery as described above
- Expand fee structure to include new services and adjust fees according to direction from Council based on the information and options in the Master Plan
- Revise the Cemetery Bylaw with the following information:
 - ▶ add policies related to the new services
 - ▶ define “resident” – potential definition “a person with a close personal connection to the District of Squamish, including current residents, previous residents, immediate relations of current or previous residents, including a parent, grandparent, or sibling, including the biological, adopted, and step variations thereof. Proof of residency may be required by the District’s designate, who will have the authority to confirm resident status with respect to this Bylaw”
 - ▶ add a clause allowing reduced fees for those who find the set fees unaffordable
 - ▶ allow up to four sets of cremains in a full burial plot
- Establish budgets for cemetery upgrades in the 2022 – 2026 5-year Financial Plan and future Financial Plans as described this Master Plan
- In the year or two prior to capital upgrades, conduct detailed design for each phase of cemetery upgrading and expansion
- Undertake capital development projects for each phase in the year identified in this Master Plan

APPENDIX A:

DATA USED FOR GHG CALCULATIONS

APPENDIX A:

DATA USED FOR GHG CALCULATIONS

Cremation

Item / Material	CO ₂ Output
Burning	240.00 kg CO ₂ eq
Urn	Concrete - 0.68 kg CO ₂ eq
	Metal – 66.22 kg CO ₂ eq
Vault	0.48 kg CO ₂ per vault
Columbarium	125.07 kg CO ₂ eq per columbarium (standard) (with 48 niches)
Lawn Fertilizer (N)	0.02 kg CO ₂ eq per plot per year
Granite Headstone and Concrete Base	Granite Headstone – 371.46kg CO ₂ eq / Concrete Base – 16.98 kg CO ₂ eq
Biomass Degeneration	0.396 kg CO ₂ eq

- Each cremation releases about **240.00 kg of CO₂** into the atmosphere
- Cremains emit **0.396kg of CO₂ eq** from biomass degeneration
- Burning
 - ▶ Furnace operates under 1590-1797 degrees Fahrenheit or 870 - 980 degrees Celsius
 - Takes up to an hour to incinerate a human body
 - Body is cremated in either a cardboard or wood casket
 - Requires the equivalent of 3 cubic metres of natural gas (**7.16 kg CO₂ eq** per 3 m³) or 3 litres of fuel oil (**9.57 kg CO₂ eq** per 3 litres)
 - Additional energy is used to heat up the furnace
 - Furnaces are typically lined with ceramic bricks and require a significant amount of energy and materials to produce

- Urns
 - ▶ Concrete = **0.68 kg of CO₂ eq** emitted
 - ▶ Metal = **66.22 kg CO₂ eq** emitted
 - ▶ Urn Vault = **0.48 kg CO₂ eq** emitted

Full Burial

Item / Material	CO ₂ Output
Fibreglass Casket	62.00 kg CO ₂ eq per casket
Wood Casket	40.00 kg CO ₂ eq per casket
Concrete Vault	146.62 kg CO ₂ eq per vault
Fibreglass Vault	176.80kg CO ₂ eq per vault
Casket Lining	Nylon/ Cloth 7.90 kg CO ₂ eq per kg of material
Body Covering	Nylon/ Cloth 7.90 kg CO ₂ eq per kg of material
Rubber Gasket	3.18 kg CO ₂ eq per kg of material
Stainless Steel Hinges	6.15 kg CO ₂ eq per kg of material
Headstones	Granite Headstone – 371.46 kg CO ₂ eq / Concrete Base – 16.98 kg CO ₂ eq
Lawn Mowers	3.00 kg CO ₂ eq emitted per hour of use
Excavators	111.65 kg CO ₂ eq per hour of use
Trip made by Hearse	5.70 kg CO ₂ eq emitted per funeral trip (30km)
Biomass Degeneration	1.35 kg of CO ₂ eq produced per body

- Embalming fluid → 5-50% Formaldehyde + 9 – 96 % Ethanol
- 7.57 litres of embalming fluid per body
 - ▶ Formaldehyde emits between **0.95 and 9.50 kg CO₂ eq** per body
 - ▶ Ethanol emits between **0.84 and 9.01 kg CO₂ eq** per body
- Formaldehyde (CH₂O)
 - ▶ Can affect worker health and soil
- Soils samples taken at coffin depth revealed elevated concentrations of copper (2.77/ kg), zinc (3.41/kg), lead (1.64/ kg) and iron (1.91/kg) (used to make coffins)

- Chemical fertilizers for maintained lawns
 - ▶ Winter Fertilizer – High in Phosphorus (P) and Potash (K)
 - P → **2.70 /kg eq** of CO₂ emitted
 - K₂CO₃ → **2.38/kg of CO₂ eq** produced or K₂O → **0.69/kg of CO₂ eq** produced
- Spring/ Summer Fertilizer – High in Nitrogen (N)
 - ▶ N **4.62/ kg of CO₂ eq** emitted
 - **3.77 kg CO₂ eq** emitted per 1000 sf of lawn per year
- The suggested amount of nitrogen for 1,000 square feet of grass is 1.8 lbs (0.816kg) per year. (spread over 2- 4 applications) (depending on time of year slow release or quick release)

Green Burial

Material	Unit CO ₂ Output
Cardboard Casket	29.70 kg CO ₂ eq per casket
Simple Plywood Box/ Shroud	32.43 kg CO ₂ eq per shroud
Body Covering	Nylon/ Cloth - 7.90 kg CO ₂ eq per kg of material
Group Monument (50 people)	375.00 kg of CO ₂ eq emitted per headstone (Natural Stone, CO ₂ emissions for transport and engraving)
Excavators	111.65 kg CO ₂ eq per hour of use (1 h per plot)
Trip made by Hearse	5.70 kg CO ₂ eq emitted per funeral trip (30km)
Biomass Degeneration	1.35 kg of CO ₂ produced per body

APPENDIX B:

POPULATION, MORTALITY AND INTERMENT TREND ANALYSIS

APPENDIX B:

POPULATION, MORTALITY AND INTERMENT TREND ANALYSIS

District of Squamish Population Projection, Total Deaths, and Death Rate per 1,000 Population, 2019-2048

District of Squamish				
Year	Population	Pop. Change	Total Deaths	Death Rate per 1,000 People
2019	21,265		101	4.8
2020	21,877	2.9%	108	4.9
2021	22,516	2.9%	115	5.1
2022	23,136	2.8%	121	5.2
2023	23,796	2.9%	129	5.4
2024	24,428	2.7%	138	5.7
2025	25,046	2.5%	147	5.9
2026	25,668	2.5%	157	6.1
2027	26,287	2.4%	168	6.4
2028	26,939	2.5%	178	6.6
2029	27,530	2.2%	189	6.9
2030	28,140	2.2%	201	7.1
2031	28,696	2.0%	213	7.4
2032	29,242	1.9%	225	7.7
2033	29,807	1.9%	237	8.0
2034	30,360	1.9%	248	8.2
2035	30,919	1.8%	261	8.4
2036	31,460	1.7%	274	8.7
2037	31,992	1.7%	287	9.0
2038	32,560	1.8%	300	9.2
2039	33,015	1.4%	313	9.5
2040	33,438	1.3%	327	9.8

District of Squamish				
Year	Population	Pop. Change	Total Deaths	Death Rate per 1,000 People
2041	33,873	1.3%	343	10.1
2042	34,116	0.7%	356	10.4
2043	34,553	1.3%	371	10.7
2044	34,972	1.2%	386	11.0
2045	35,299	0.9%	399	11.3
2046	35,737	1.2%	415	11.6
2047	36,128	1.1%	430	11.9
2048	36,529	1.1%	444	12.2

Notes: Population forecast as per description in Section 2.1; deaths forecast uses projected age-specific mortality rates for SLRD, applied to District population

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Squamish-Lillooet Regional District Deaths, 2001-2017

Age	2001 / 2002	2002 / 2003	2003 / 2004	2004 / 2005	2005 / 2006	2006 / 2007	2007 / 2008	2008 / 2009	2009 / 2010	2010 / 2011	2011 / 2012	2012 / 2013	2013 / 2014	2014 / 2015	2015 / 2016	2016 / 2017
0 to 4 years	0	0	0	0	0	0	0	1	1	0	2	1	0	0	0	0
5 to 9 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 to 14 years	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
15 to 19 years	3	1	2	3	3	3	1	0	1	1	1	0	2	2	2	2
20 to 24 years	0	5	4	3	3	1	3	1	3	2	0	1	1	1	1	1
25 to 29 years	2	4	5	2	3	6	3	2	3	3	2	0	2	2	2	2
30 to 34 years	4	3	1	3	3	3	4	5	1	2	1	2	2	2	2	2
35 to 39 years	4	4	3	3	3	1	0	5	4	5	7	1	2	2	2	2
40 to 44 years	2	2	4	2	2	2	5	6	3	1	7	8	3	3	3	3
45 to 49 years	10	6	10	9	10	8	7	8	10	3	10	9	3	3	3	3
50 to 54 years	2	3	9	4	4	11	8	7	6	9	11	7	9	9	9	9
55 to 59 years	6	9	11	8	8	11	15	19	16	14	19	13	14	14	14	14
60 to 64 years	10	7	8	7	7	15	14	12	9	13	11	18	9	9	9	11
65 to 69 years	17	13	16	17	17	20	13	11	13	14	17	18	14	16	16	18
70 to 74 years	18	19	17	22	20	13	8	17	14	18	12	13	26	29	30	32
75 to 79 years	20	18	22	21	20	18	28	18	12	18	19	13	19	20	20	22
80 to 84 years	17	15	11	14	15	16	11	19	25	19	17	27	23	23	23	25
85 to 89 years	11	14	14	13	12	15	16	15	17	16	21	20	14	14	14	15
90 years and over	2	8	5	7	10	9	16	13	9	17	20	13	24	21	24	27
TOTAL	129	131	142	138	140	153	152	159	147	155	177	164	167	170	174	188

Squamish-Lillooet Regional District Population, 2001-2017

Age	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
0 - 4 years	2,135	2,141	2,162	2,127	2,119	2,111	2,158	2,302	2,294	2,313	2,503	2,519	2,532	2,537	2,420	2,462	2,568
5 - 9 years	2,299	2,187	2,130	2,134	2,062	2,074	2,091	2,092	2,059	2,056	2,150	2,250	2,343	2,424	2,428	2,499	2,594
10 - 14 years	2,258	2,303	2,313	2,343	2,289	2,301	2,168	2,060	2,080	2,036	2,033	2,038	2,066	2,061	1,942	2,030	2,146
15 - 19 years	2,245	2,320	2,336	2,364	2,274	2,296	2,240	2,118	2,165	2,157	2,245	2,230	2,160	2,145	2,054	2,020	2,039
20 - 24 years	3,001	2,934	2,918	2,970	2,848	2,795	3,003	3,017	3,119	2,933	2,772	2,948	2,950	2,942	2,885	2,946	3,004
25 - 29 years	3,371	3,353	3,387	3,336	3,315	3,445	3,473	3,560	3,826	3,774	3,642	3,535	3,400	3,305	3,246	3,309	3,481
30 - 34 years	3,408	3,397	3,339	3,475	3,488	3,561	3,552	3,637	3,765	3,886	3,844	3,877	3,846	3,866	3,797	3,848	4,003
35 - 39 years	3,423	3,278	3,285	3,234	3,165	3,283	3,303	3,349	3,540	3,710	3,733	3,794	3,797	3,777	3,767	3,956	4,119
40 - 44 years	3,145	3,228	3,236	3,276	3,298	3,301	3,175	3,073	3,075	3,137	3,316	3,416	3,472	3,539	3,603	3,667	3,818
45 - 49 years	2,564	2,669	2,797	2,848	2,860	2,951	2,968	3,011	3,074	3,143	3,040	3,028	2,971	3,003	2,940	3,069	3,206
50 - 54 years	2,107	2,092	2,208	2,342	2,411	2,516	2,483	2,481	2,561	2,669	2,757	2,784	2,836	2,852	2,819	2,844	2,876
55 - 59 years	1,463	1,621	1,696	1,778	1,870	2,016	1,986	2,080	2,137	2,244	2,319	2,461	2,511	2,526	2,489	2,604	2,617
60 - 64 years	1,045	1,102	1,241	1,285	1,335	1,366	1,482	1,519	1,537	1,654	1,867	1,896	1,990	2,070	2,143	2,193	2,314
65 - 69 years	832	834	814	844	879	941	966	1,028	1,091	1,178	1,260	1,381	1,428	1,508	1,570	1,698	1,736
70 - 74 years	585	629	665	674	693	694	670	671	702	768	815	884	930	1,005	1,085	1,146	1,220
75 - 79 years	413	423	440	465	441	461	467	502	491	549	579	563	548	590	613	659	695
80 - 84 years	222	255	274	293	311	300	274	284	293	289	343	371	396	392	414	440	421
85 - 89 years	123	116	114	128	152	165	158	172	176	190	192	181	183	199	200	224	230
90 years +	36	35	26	27	15	62	60	58	74	102	103	145	159	165	175	181	187
TOTAL	34,675	34,917	35,381	35,943	35,825	36,639	36,677	37,014	38,059	38,788	39,513	40,301	40,518	40,906	40,590	41,795	43,274

Squamish-Lillooet Regional District Mortality Rates, 2001-2017

Age	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
0 to 4 years	0.19%	0.05%	0.09%	0.09%	0.09%	0.14%	0.14%	0.04%	0.13%	0.09%	0.12%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
5 to 9 years	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10 to 14 years	0.04%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15 to 19 years	0.13%	0.04%	0.08%	0.13%	0.13%	0.13%	0.05%	0.00%	0.05%	0.04%	0.04%	0.00%	0.09%	0.10%	0.10%	0.10%	0.10%
20 to 24 years	0.00%	0.17%	0.13%	0.11%	0.11%	0.03%	0.10%	0.03%	0.10%	0.07%	0.00%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
25 to 29 years	0.06%	0.12%	0.15%	0.06%	0.09%	0.17%	0.08%	0.05%	0.08%	0.08%	0.06%	0.00%	0.06%	0.06%	0.06%	0.06%	0.06%
30 to 34 years	0.12%	0.09%	0.03%	0.09%	0.08%	0.08%	0.11%	0.13%	0.03%	0.05%	0.03%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
35 to 39 years	0.12%	0.12%	0.09%	0.09%	0.09%	0.03%	0.00%	0.14%	0.11%	0.13%	0.18%	0.03%	0.05%	0.05%	0.05%	0.05%	0.05%
40 to 44 years	0.06%	0.06%	0.12%	0.06%	0.06%	0.06%	0.16%	0.20%	0.10%	0.03%	0.20%	0.23%	0.08%	0.08%	0.08%	0.08%	0.08%
45 to 49 years	0.37%	0.21%	0.35%	0.31%	0.34%	0.27%	0.23%	0.26%	0.32%	0.10%	0.33%	0.30%	0.10%	0.10%	0.10%	0.09%	0.09%
50 to 54 years	0.10%	0.14%	0.38%	0.17%	0.16%	0.44%	0.32%	0.27%	0.22%	0.33%	0.40%	0.25%	0.32%	0.32%	0.32%	0.31%	0.31%
55 to 59 years	0.37%	0.53%	0.62%	0.43%	0.40%	0.55%	0.72%	0.89%	0.71%	0.60%	0.77%	0.52%	0.55%	0.56%	0.54%	0.53%	0.53%
60 to 64 years	0.91%	0.56%	0.62%	0.52%	0.51%	1.01%	0.92%	0.78%	0.54%	0.70%	0.58%	0.90%	0.43%	0.42%	0.41%	0.48%	0.48%
65 to 69 years	2.04%	1.60%	1.90%	1.93%	1.81%	2.07%	1.26%	1.01%	1.10%	1.11%	1.23%	1.26%	0.93%	1.02%	0.94%	1.04%	1.04%
70 to 74 years	2.86%	2.86%	2.52%	3.17%	2.88%	1.94%	1.19%	2.42%	1.82%	2.21%	1.36%	1.40%	2.59%	2.67%	2.62%	2.62%	2.62%
75 to 79 years	4.73%	4.09%	4.73%	4.76%	4.34%	3.85%	5.58%	3.67%	2.19%	3.11%	3.37%	2.37%	3.22%	3.26%	3.03%	3.17%	3.16%
80 to 84 years	6.67%	5.47%	3.75%	4.50%	5.00%	5.84%	3.87%	6.48%	8.65%	5.54%	4.58%	6.82%	5.87%	5.56%	5.23%	5.94%	5.94%
85 to 89 years	9.48%	12.28%	10.94%	8.55%	7.27%	9.49%	9.30%	8.52%	8.95%	8.33%	11.60%	10.93%	7.04%	7.00%	6.25%	6.52%	6.51%
90 years +	5.71%	30.77%	18.52%	46.67%	16.13%	15.00%	27.59%	17.57%	8.82%	16.50%	13.79%	8.18%	14.55%	12.00%	13.26%	14.44%	14.32%

District of Squamish Deaths and Local Interment Needs, 2019-2048

Year	District of Squamish					
	Projected Deaths by Interment type			Expected Interments in Squamish		% of Interments to Deaths
	Deaths	Burial	Cremation	Burial	Cremation	Total
2019	101	11	90	8	27	35%
2020	108	12	96	8	29	34%
2021	115	12	103	8	31	34%
2022	121	12	109	9	33	34%
2023	129	13	116	9	35	34%
2024	138	14	124	10	37	34%
2025	147	15	132	10	40	34%
2026	157	16	142	11	43	34%
2027	168	17	151	12	45	34%
2028	178	18	160	12	48	34%
2029	189	19	170	13	51	34%
2030	201	20	181	14	54	34%
2031	213	21	192	15	57	34%
2032	225	22	202	16	61	34%
2033	237	24	213	17	64	34%
2034	248	25	224	17	67	34%
2035	261	26	235	18	70	34%
2036	274	27	247	19	74	34%
2037	287	29	258	20	78	34%
2038	300	30	270	21	81	34%
2039	313	31	282	22	84	34%
2040	327	33	295	23	88	34%
2041	343	34	309	24	93	34%
2042	356	36	321	25	96	34%
2043	371	37	334	26	100	34%
2044	386	39	347	27	104	34%

District of Squamish						
Year	Projected Deaths by Interment type			Expected Interments in Squamish		% of Interments to Deaths
	Deaths	Burial	Cremation	Burial	Cremation	Total
2045	399	40	359	28	108	34%
2046	415	42	374	29	112	34%
2047	430	43	387	30	116	34%
2048	444	44	400	31	120	34%

The ratio of District deaths to District interments has been based on review of available data showing the historical proportions of local interments vs. inferred historical resident deaths.

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APPENDIX C:

PROJECTED
NEEDS ANALYSIS

APPENDIX C:

PROJECTED NEEDS ANALYSIS

Table 3: District of Squamish Municipal Cemetery Interment by Type. 2019-2048

Squamish Municipal Cemeteries Interment by Type							
Year	Total Interments	% Traditional Casket	# Traditional Casket	% Green Burial	# Green Burial	% Cremated Burials + Scattering	# Cremated Burials + Scattering
2019	35	23%	8	0%	0	77%	27
2020	37	22%	8	0%	0	78%	29
2021	39	20%	8	0%	0	79%	31
2022	41	22%	9	0%	0	80%	33
2023	44	21%	9	0%	0	89%	39
2024	47	19%	9	2%	1	87%	41
2025	50	20%	10	2%	1	88%	44
2026	54	19%	10	4%	2	88%	47
2027	57	19%	11	4%	2	86%	49
2028	61	18%	11	3%	2	87%	53
2029	64	19%	12	5%	3	87%	56
2030	68	19%	13	4%	3	86%	59
2031	72	18%	13	4%	3	87%	63
2032	76	18%	14	4%	3	86%	66
2033	81	19%	15	4%	3	86%	69
2034	84	19%	16	4%	3	86%	73
2035	89	18%	16	5%	4	87%	77
2036	93	18%	17	4%	4	87%	81
2037	98	18%	18	4%	4	87%	85
2038	102	19%	19	4%	4	86%	88
2039	106	19%	20	4%	4	86%	92
2040	111	19%	21	4%	4	86%	96
2041	117	19%	22	4%	5	86%	101

Squamish Municipal Cemeteries Interment by Type

Year	Total Interments	% Traditional Casket	# Traditional Casket	% Green Burial	# Green Burial	% Cremated Burials + Scattering	# Cremated Burials + Scattering
2042	121	19%	23	4%	5	87%	105
2043	126	18%	23	4%	5	86%	109
2044	131	18%	24	4%	5	85%	112
2045	136	18%	25	4%	5	85%	116
2046	141	18%	26	4%	6	85%	120
2047	146	18%	27	4%	6	86%	125
2048	151	19%	28	4%	6	85%	129

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APPENDIX D:

CONCEPT PLAN OPTIONS

CONCEPT PLAN

OPTION A

1. NEW ROAD
2. PARKING
3. PATH
4. SEATING AREA
5. ENTRANCE GATE
6. MAINTENANCE YARD
7. VEGETATION BUFFER
8. TREE PLANTINGS
9. OLD GROWTH TREES
10. SCATTERING GARDEN
11. ENTRY SIGN



CONCEPT PLAN

OPTION B

1. NEW ROAD
2. PARKING
3. PATH
4. BENCH
5. ENTRANCE GATE
6. MAINTENANCE YARD
7. VEGETATION BUFFER
8. TREE PLANTINGS
9. OLD GROWTH TREES
10. SCATTERING GARDEN
11. ENTRY SIGN
12. OPEN AIR SHELTER
13. PICNIC TABLE



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APPENDIX E:

COST ESTIMATE

PHASE 1

ITEM	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	TOTAL
1.1	Removals				
	a) remove and dispose West chain link fence	lineal m	190	\$30.00	\$5,700.00
	b) remove and dispose concrete parking lot curb	lineal m	65	\$15.00	\$975.00
	c) tree protection measures	allowance	1	\$3,000.00	\$3,000.00
1.2	Parking Area				
	a) asphalt pavement	m2	1010	\$80.00	\$80,800.00
	b) parking lines (paint)	ea	38	\$50.00	\$1,900.00
	c) wheel stops	each	38	\$100.00	\$3,800.00
1.3	Planting				
	a) trees - 6cm cal.	ea	14	\$600.00	\$8,400.00
1.4	Grass				
	a) seed including 50 mm topsoil dress	m2	170	\$8.00	\$1,360.00
1.5	Furnishings and Features				
	a) Split rail fence on west edge of property	lineal m	190	\$125.00	\$23,750.00
	b) entrance feature	lump sum	1	\$10,000.00	\$10,000.00
	c) refurbish historical MGC gate	allowance	1	\$8,000.00	\$8,000.00
	d) restoration of monuments and plots in north-west	lump sum	1	\$8,000.00	\$8,000.00
	e) scattering garden markers	allowance	1	\$6,000.00	\$6,000.00
	<i>Sub-total</i>				<i>\$161,700</i>
	<i>Consulting (15%) & Contingency (40%)</i>			55%	<i>\$88,900</i>
	TOTAL				\$250,600

Notes:

1. Estimate excludes applicable taxes
2. Assumes existing irrigation supply will support new trees
3. Estimate does not account for cost inflation over time

PHASE 2

ITEM	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	TOTAL
2.1	Removals				
	a) timber felling	lump sum	1	\$35,000.00	\$35,000.00
	b) forest clearing and grubbing	m2	4650	\$2.00	\$9,300.00
	c) remove and salvage maintenance yard	lump sum	1	\$6,500.00	\$6,500.00
	d) remove and dispose of south and south-east perimeter cha	lineal m	170	\$30.00	\$5,100.00
	e) tree protection measures	allowance	1	\$6,000.00	\$6,000.00
2.2	Earthworks and Grading				
	a) site grading	m2	4650	\$5.00	\$23,250.00
2.3	Parking Area				
	a) asphalt pavement with granular base	m2	200	\$80.00	\$16,000.00
	b) parking lines (paint)	lump sum	6	\$50.00	\$300.00
	c) wheel stops	each	8	\$100.00	\$800.00
2.4	Full Depth Burial Areas				
	a) full depth excavation and boulder removal	m3	850	\$30.00	\$25,500.00
2.5	Road - paved, 2-way				
	a) asphalt road including excavation and gravel base	m2	300	\$120.00	\$36,000.00
2.6	Road - gravel, 1-way				
	b) gravel road including excavation	m2	650	\$50.00	\$32,500.00
	c) signage	ea	3	\$500.00	\$1,500.00
2.7	Seating Area				
	a) concrete paving with sandblast finish	m2	75	\$150.00	\$11,250.00
	b) shrub beds including 450 mm growing medium	m2	20	\$65.00	\$1,300.00
	b) sign kiosk	ea	1	\$4,000.00	\$4,000.00
	b) new picnic table	ea	1	\$3,500.00	\$3,500.00
	c) long bench	ea	1	\$6,000.00	\$6,000.00
2.8	Path				
	a) granular path	m2	280	\$35.00	\$9,800.00
2.9	Planting				
	a) trees	ea	23	\$600.00	\$13,800.00
	b) restoration planting - infill shrubs and trees	allowance	1	\$5,000.00	\$5,000.00
2.10	Grass				
	a) seed, incl.150 mm growing medium	m2	2970	\$12.00	\$35,640.00
	a) irrigation	m2	2970	\$25.00	\$74,250.00
2.11	Scattering Garden				
	a) site preparation w/ tree retention	m2	530	\$20.00	\$10,600.00
2.12	Maintenance Yard				
	a) black chain link fence w slats 1.8 m high	linear m	80	\$110.00	\$8,800.00
	b) maintenance building	allowance	1	\$150,000.00	\$150,000.00
	c) appurtenances	allowance	1	\$5,000.00	\$5,000.00
	d) water connection	allowance	1	\$30,000.00	\$30,000.00
	b) utilities - overhead power	allowance	1	\$10,000.00	\$10,000.00
	e) granular surface	m2	350	\$50.00	\$17,500.00
2.13	Washrooms				
	a) washroom building (Optional)	allowance	1	\$110,000.00	\$110,000.00
	b) utilities - sanitary sewer (Optional)	allowance	1	\$55,000.00	\$55,000.00

2.14 Furnishings and Features

a)	post and wire fence at south perimeter	lineal m	130	\$90.00	\$11,700.00
d)	scattering garden markers	allowance	1	\$10,000.00	\$10,000.00
<i>Sub-total</i>					<i>\$780,900</i>
<i>Consulting (15%) & Contingency (40%)</i>					<i>55%</i>
TOTAL					\$1,210,400

Notes:

1. Estimate excludes applicable taxes
2. Assumes existing irrigation supply will support additional water volume and flow requirements
3. Estimate does not account for cost inflation over time

PHASE 3

ITEM	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	TOTAL
3.1	Removals				
a)	timber felling	lump sum	1	\$30,000.00	\$30,000.00
c)	forest clearing and grubbing	m2	3800	\$2.00	\$7,600.00
c)	remove and dispose north and north-east perimeter cl	lineal m	140	\$30.00	\$4,200.00
d)	tree protection measures	allowance	1	\$6,000.00	\$6,000.00
3.2	Earthworks and Grading				
a)	site grading	m2	3800	\$5.00	\$19,000.00
3.3	Full Depth Burial Areas				
a)	full depth excavation and boulder removal	m3	2500	\$30.00	\$75,000.00
3.4	Road - gravel, 1-way				
b)	gravel road including excavation	m2	340	\$50.00	\$17,000.00
3.5	Path				
a)	granular path	m2	240	\$35.00	\$8,400.00
3.6	Planting				
a)	trees	ea	11	\$600.00	\$6,600.00
3.7	Grass				
a)	seed including 50 mm topsoil dress	m2	3215	\$10.00	\$32,150.00
b)	irrigation	m2	3390	\$25.00	\$84,750.00
3.8	Scattering Garden				
b)	Structure	allowance	1	\$40,000.00	\$40,000.00
3.9	Furnishings and Features				
a)	post and wire fence at north perimeter	lineal m	100	\$90.00	\$9,000.00
c)	scattering garden markers	allowance	1	\$10,000.00	\$10,000.00
<i>Sub-total</i>					<i>\$349,700</i>
<i>Consulting (15%) & Contingency (40%)</i>					<i>55%</i>
TOTAL					\$542,000

Notes:

1. Estimate excludes applicable taxes
2. Assumes existing irrigation supply will support additional water volume and flow requirements
3. Estimate does not account for cost inflation over time

SUMMARY

DESCRIPTION	UNIT PRICE	TOTAL
PHASE 1		
<i>Sub-total</i>		<i>\$161,700</i>
<i>Consulting (15%) & Contingency (40%)</i>	55%	<i>\$88,900</i>
PHASE 1 TOTAL		<i>\$250,600</i>
PHASE 2		
<i>Sub-total</i>		<i>\$780,900</i>
<i>Consulting (15%) & Contingency (40%)</i>	55%	<i>\$429,500</i>
PHASE 2 TOTAL		<i>\$1,210,400</i>
PHASE 3		
<i>Sub-total</i>		<i>\$349,700</i>
<i>Consulting (15%) & Contingency (40%)</i>	55%	<i>\$192,300</i>
PHASE 3 TOTAL		<i>\$542,000</i>
TOTAL		
<i>Sub-total (phase 1, 2, and 3)</i>		<i>\$1,292,300</i>
<i>Consulting (15%) & Contingency (40%)</i>	55%	<i>\$710,700</i>
TOTAL		<i>\$2,003,000</i>

Notes:

1. Estimate excludes applicable taxes
2. Assumes existing irrigation supply will support additional water volume and flow requirements
3. Estimate does not account for cost inflation over time

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MAPS

1. SITE INVENTORY
AND ANALYSIS

2. CONCEPT PLAN

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Map 1: Mount Garibaldi Cemetery Master Plan – Site Inventory and Analysis



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SQUAMISH

HARDWIRED *for* ADVENTURE