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prophet infrastructure asset management

Cemeteries Strategy 2005

Queenstown Lakes District Council

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1.0 EXECUTIVE SUMMARY

The Queenstown Lakes District has good provision for cemetery space. Current cemeteries have capacity to cater for more than 50 years of anticipated demand.

The Cemeteries at Arrowtown, Frankton and Queenstown will reach capacity sooner than the other cemeteries, and when full, interments will occur instead at Lower Shotover Cemetery.

The approach taken in this strategy is to retain the current landholding of cemeteries, and encourage the full use of these before acquiring additional land for interments. The exception to this rule is the Lower Shotover Cemetery, where opportunities to purchase adjacent land will be explored as they arise.

Having the use of a crematorium in the district will significantly extend the life of all cemeteries - ash interments taking up less space than burials. The feasibility of this occurring needs further analysis and consideration.



Fig 1.1 Headstone at Queenstown Cemetery

2.0 INTRODUCTION

2.1 Scope

This strategy was commissioned by Queenstown Lakes District Council with the intent to:

- Collect information on cemeteries in the district, and to record this information under one cover
- Ascertain the current capacity of all cemeteries
- Analyse district mortality trends in the district
- Project future demand for the next 50 years
- Consider and recommend the need for Cemetery Development Plans
- Investigate current management structures for the District's cemeteries, and make recommendations on future management
- Establish operating procedures for cemeteries managed by the Council

These last two items have been undertaken under separate cover.

2.2 Stakeholders

The following stakeholders were consulted during the preparation of this strategy:

- Imtech Ltd.
- Russell McGrouther, Funeral Director, of Queenstown Lakes District Funeral Services Ltd
- Jim Harborow, Funeral Director, of Harborow & Co. Ltd. and Cromwell & Southern Lakes Funeral Services Ltd.
- Brian Umbers and fellow Trustees of the Wanaka Cemetery Trust
- Don McKinley, Wanaka Cemetery Sexton
- Donald Urquhart, Sexton and Trustee for Hawea Cemetery
- Historic Cemeteries Conservation Trust of New Zealand



Fig 2.1 Monument at Queenstown Cemetery

3.0 REGULATORY & STATUTORY FRAMEWORK

There are four Acts of Parliament and three Regulations which significantly dictate the provision, use and management of cemeteries by local authorities.

i) Burials and Cremations Act 1964

The Act is divided into 9 parts.

- Part I of the Act deals with establishment, maintenance and regulation of cemeteries.
- Part II with finance and miscellaneous functions
- Part III with trustees
- Part IV with burial grounds
- Part V with cremation
- Part VI with closing of cemeteries and burial grounds
- Part VII with general provisions
- Part VIII with offences and penalties and
- Part IX with regulations, savings and repeals

ii) Reserves Act 1977

The Reserves Act provides for the preservation and management, for the benefit and enjoyment of the public, areas of New Zealand with some special feature or value. Any land designated as reserve will be classified into one of nine categories. Cemeteries are classified as Local Purpose Reserve.

iii) The Resource Management Act 1991

The Resource Management Act requires local authorities to sustainably manage the natural and physical resources in their district. This is done largely through the development of District Plans and having a consent process in place to manage change. Activities on cemeteries, include creating of new cemeteries, must comply with the requirements of this Act.

iv) Local Government Act 2002

This Act dictates how local government conducts its business, including cemetery management. Some of the ways that this Act influences cemetery management include:

- The requirement to undertake sanitary assessments
- The requirement to use prudent asset management practices for cemetery acquisition, improvement, maintenance and replacement
- Having to take into account when making significant decisions on cemeteries, the present and future social, economic, environmental and cultural well-being of the district.

Further, three Regulations cover cremations and burials:-

- Burial and Cremation (Removal of Monuments and Tablets) Regulations 1967
- Cremation Regulations 1973
- Health (Burial) Regulations 1946

Queenstown Lakes District Council proposed Cemeteries Bylaw - 2005, to cover cemeteries in the District.

4.0 CURRENT PROVISION

The Queenstown Lakes District Council has 12 cemeteries adequately distributed within the district boundary. The district does not have a cremation facility. The district's cemeteries are summarised in the following table.

CEMETERY	VALUATION REFERENCE	QLDC SITE CODE	APPELLATION	AREA (HA)	RESERVE CLASSIFICATION	GAZETTE NOTICE	VALUATION (GV 2002)	C/T	NOTES
Albertown	29082 01200	186	Sec 20 Blk V Lower Wanaka SD	0.2023		1927/P2908 1927/P3431	\$3,000		
Arrowtown (Algie Reserve)	29182 34900	353	Secs 10, 12-15 Blk XIX Town of Arrowtown	2.0638	Sec 12 is Local Purpose (Gaz 1982 P4111)	1996/P4118	\$230,000	43/278	
Cardrona	29061 25600	142	Sec 6 Blk XI Cardrona SD	0.4047	Local Purpose (cemetery)	1986/P2115	\$70,000	20/172	
Frankton	29103 40500	240	Cemetery Reserve No. 1 Frankton Town	0.3237	Cemetery Reserve	1985/P2899	\$130,000		
Glenorchy	29111 20000	307	Sec 1-2 Blk XVIII Town of Glenorchy	5.2559	Cemetery Reserve	1993/P1586	\$50,000		Only a small area used. Remainder leased for Grazing
Hawea	29082 04000	189	Sec 51 Blk I Lower Hawea SD	4.0469	Cemetery Reserve	1901/P988	\$30,000		Managed by Hawea Cemetery Trust
Kingston	29131 26000	317	Sec 16 Blk 1 Kingston SD	1.5783	Cemetery Reserve	1933/P2430	\$40,000		
Lower Shotover	29071 22000	168	Pt Sec 662 and Pt Sec 888R Blk III Shotover SD	3.1073			\$480,000	9A/229	Irrigation Agreement X14835. Acquired under Public Works Act
Makarora	29082 27100	M27100	Sec 9 Blk XII Wilkin SD	0.4047	Cemetery Reserve	1956/P343 1931/P281	\$4,000		
Queenstown	291006 14701	359	Sec 132 SO 20796 Blk XX Shotover SD	1.647	Local Purpose (Cemetery)	1984/P2365	\$520,000	3D/1483	
Skippers Point	29073 01000	Q01000	Sec 56 Blk XI Skippers Creek SD	0.4047		1933/P2429	\$5,000		
Wanaka	29053 71600	122	Pt Sec 1 Blk XLVIII and Pt Sec 2 Blk III Town of Wanaka	4.0494	Cemetery Reserve	1924/P2472 1926/P296	\$324,000		
Total				23.4887		Total	\$1,886,000		

Table 4.1 Cemetery Land Information

5.0 FUTURE REQUIREMENTS

It would appear from the projections undertaken that the district has more than sufficient space to cater for interments for the next 50 years.

Cemeteries which are likely to reach capacity within the next 20-30 years include Arrowtown, Frankton, Lower Shotover and Queenstown Cemeteries. Other Cemeteries will not reach capacity until well after 2055.

5.1 Discussion

The following sections detail the demand for cemetery space, the methodology used in establishing this, and the capacity of cemeteries.

Section 5.3 graphically shows the consumption of cemetery space over time. Skippers, Cardrona and Makarora Cemeteries show no consumption of space due to negligible rates of interments which have not been modelled.

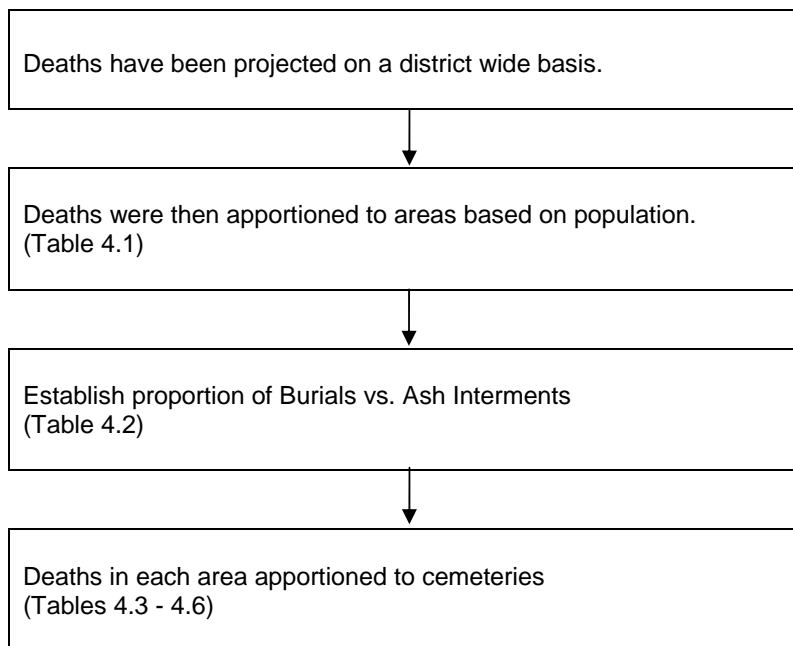
5.1.1 District Crematorium

The significance of the construction of a crematorium is clearly visible. Without the construction of a crematorium, it is anticipated that the Lower Shotover cemetery will reach capacity in between 20 and 40 years, whilst it is currently unused. The earlier construction occurs, the longer all cemeteries will last, due to a greater number of ash interments fitting into the space of a burial plot. Future demand has assumed that a cremator will be built in either 2015, 2020, or 2025 – these are conservative dates.

5.2 District Mortality Projections

5.2.1 Calculation Methodology

The methodology used to establish cemetery demand is briefly outlined below.



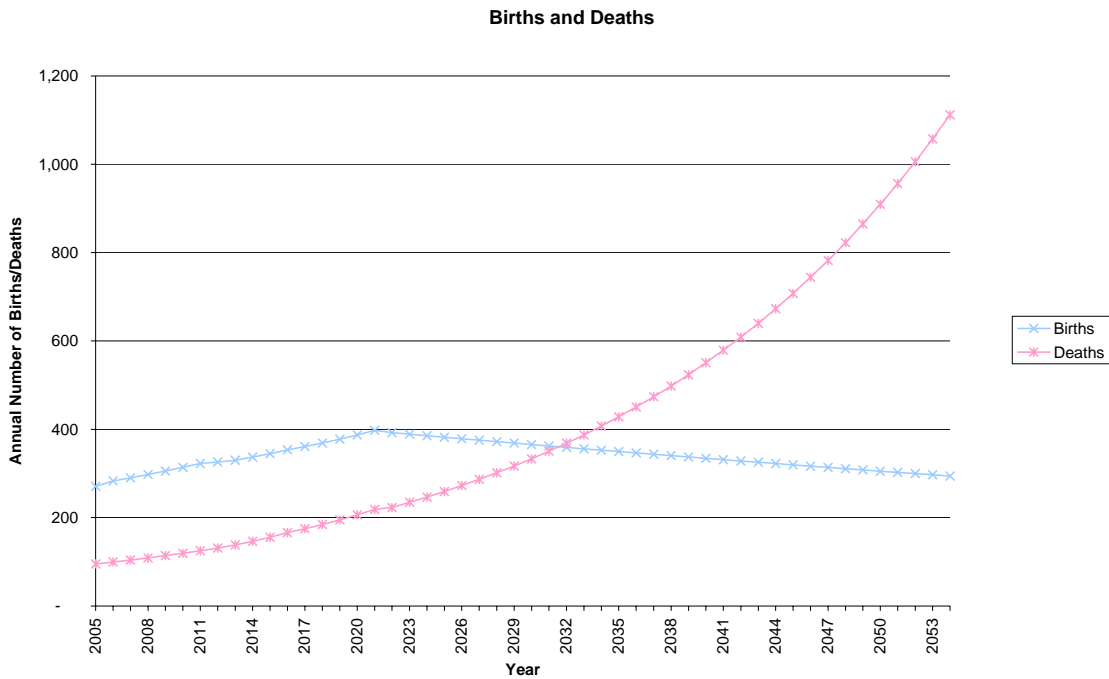
Many factors that impact on future numbers of deaths within the district, can, and have been identified. The most significant factors, which have been given due thought and consideration, are as follows:

- District Growth Rates
- Birth Rates
- Net Migration
- Ageing Population

Over any given period it can be assumed that the following equation will hold. This is fundamental in the model.

$$\text{Total Population Growth} = \text{Births} - \text{Deaths} + \text{Net Migration}$$

The following graph demonstrates annual births and deaths over time.



5.2.2 District Growth Rates

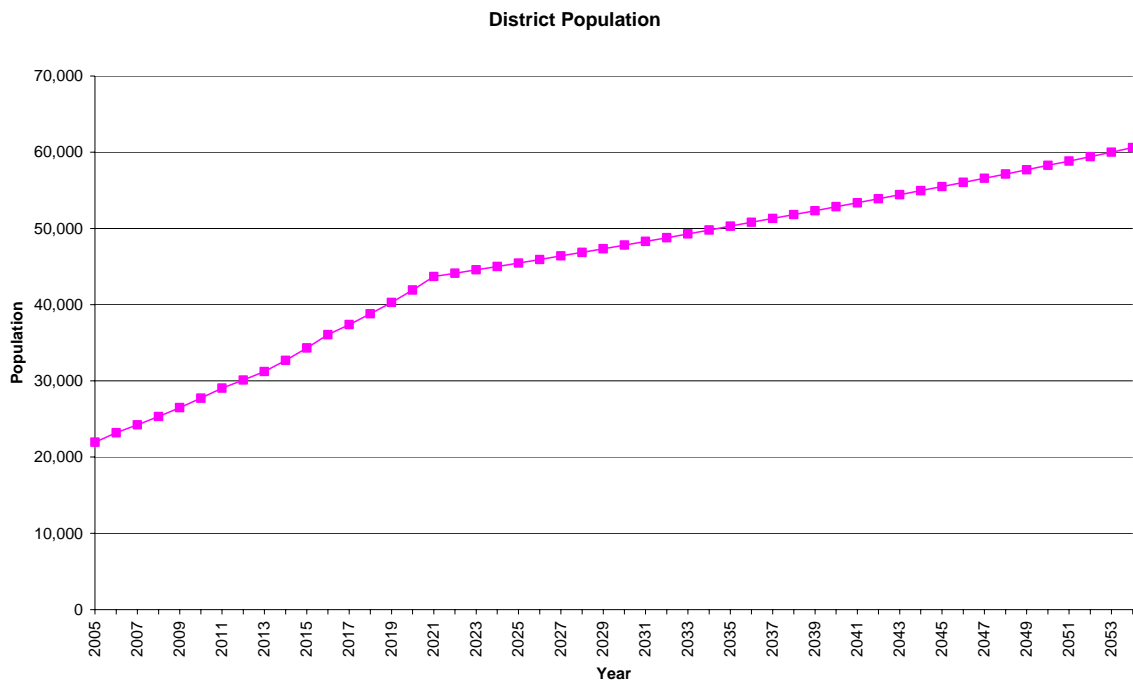
District population growth rates have been established from three sources of information:

- QLDC Growth Study
- Glenorchy and Kingston Site Specific Population Studies
- 2001 Census

The table that follows indicates the information source for the key townships and areas when projecting population figures. The Growth Study and Census data projects population as far as 2021 and the Kingston and Glenorchy Site Specific projections are until the townships reach capacity. Following the table, the district population projections are shown graphically.

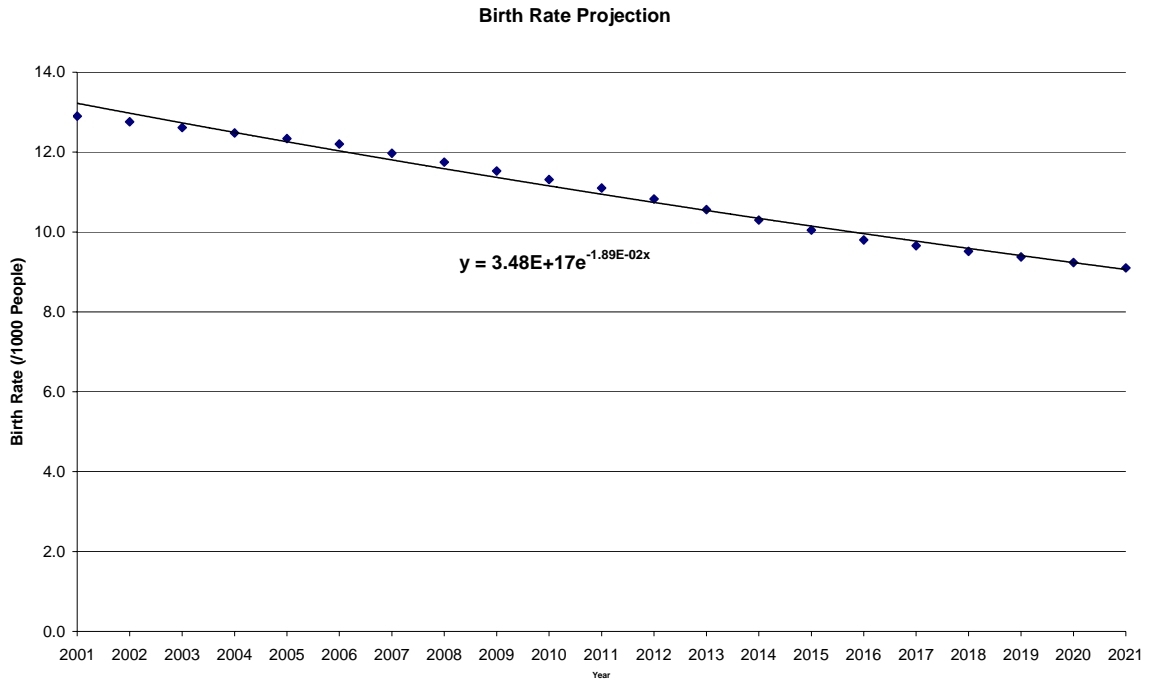
In the case of the Growth Study and Census projections, a growth rate of 1% has been applied from 2021 forward. This is potentially conservative but has been applied in other Council Studies.

Contributing Area	Growth Projections Used
Wakatipu Ward	SNZ Projections (2001 Base)
Queenstown	Growth Study 2003
Arrowtown	Growth Study 2003
Glenorchy	Site Specific
Lake Hayes	Growth Study 2003
Arthurs Point	Growth Study 2003
Wanaka Ward	SNZ Projections (2001 Base)
Wanaka	Growth Study 2003
Hawea	SNZ Projections (2001 Base)
Albert Town	Growth Study 2003
Luggate	SNZ Projections (2001 Base)



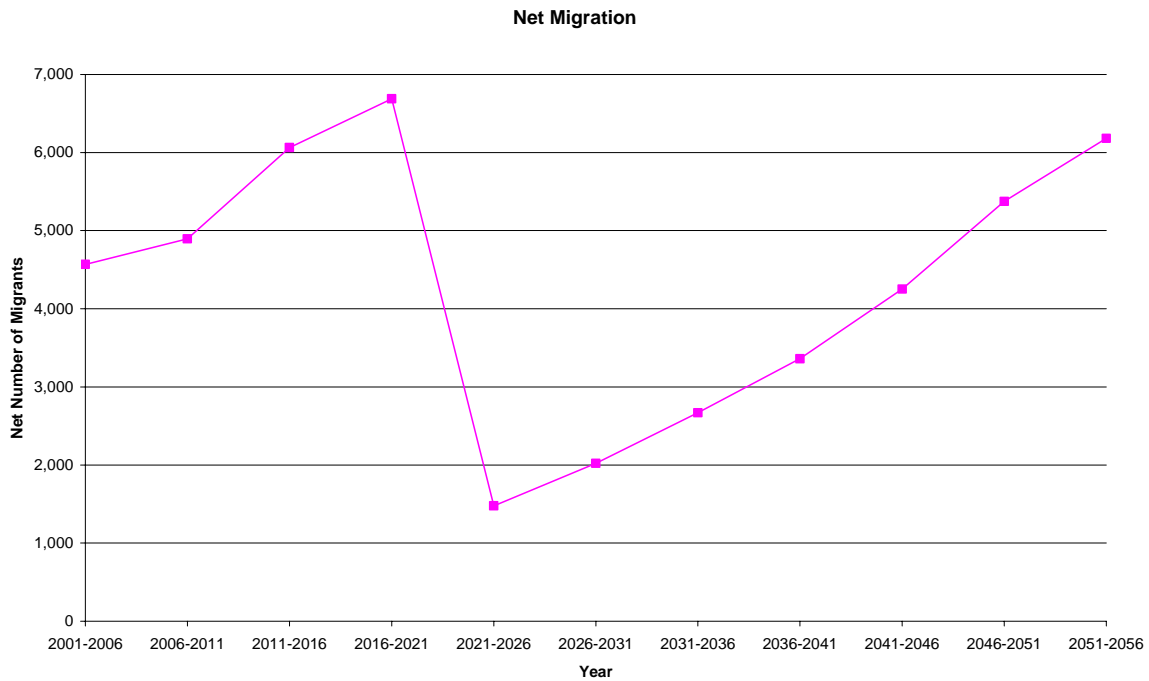
5.2.3 Birth Rates

The birth rate applied is the Statistics NZ birth rate for Queenstown Lakes District assuming medium growth. This has been applied through to 2021. Post 2021, the birth rate has been projected to decline exponentially.



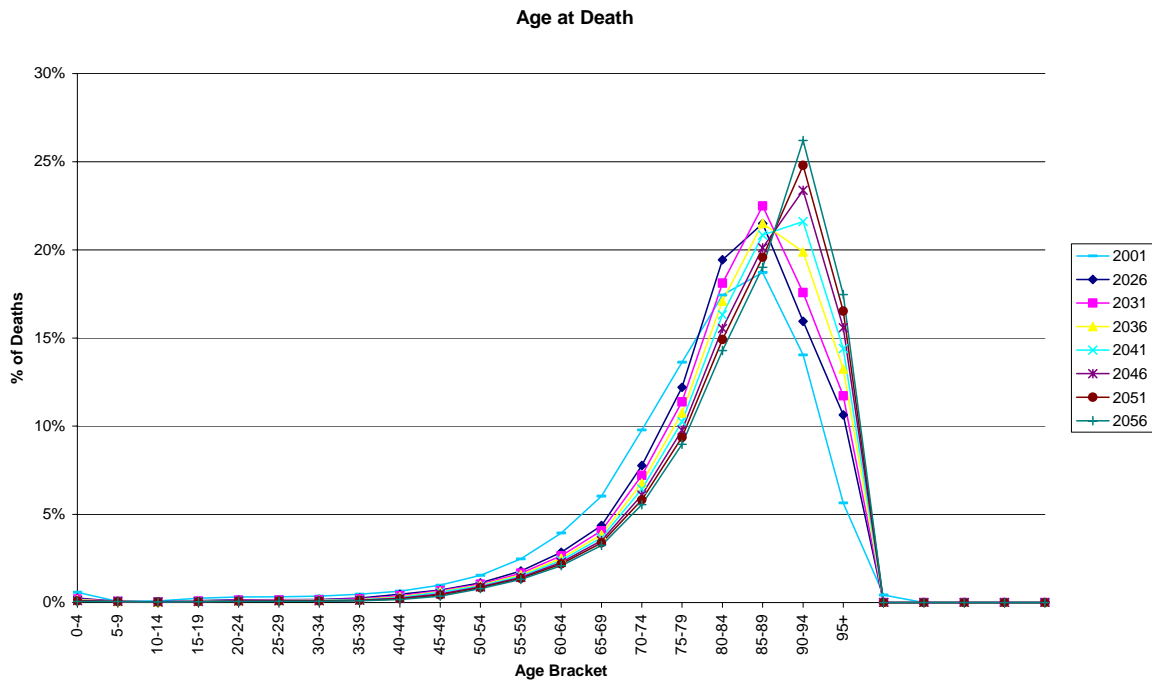
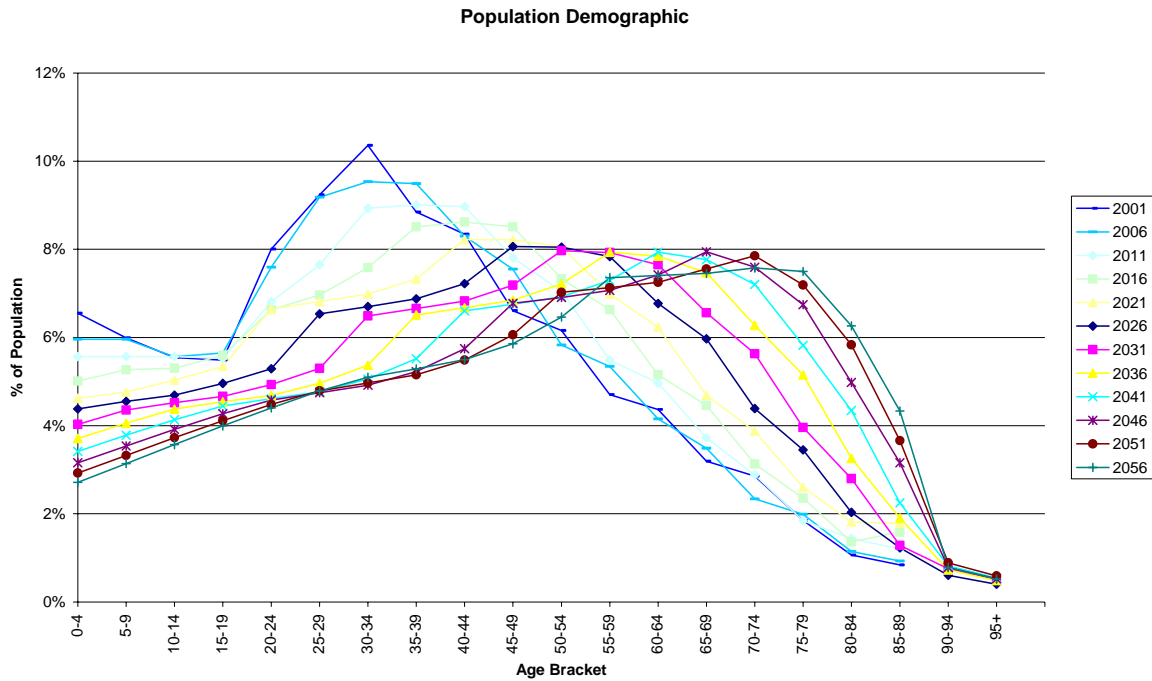
5.2.4 Net Migration

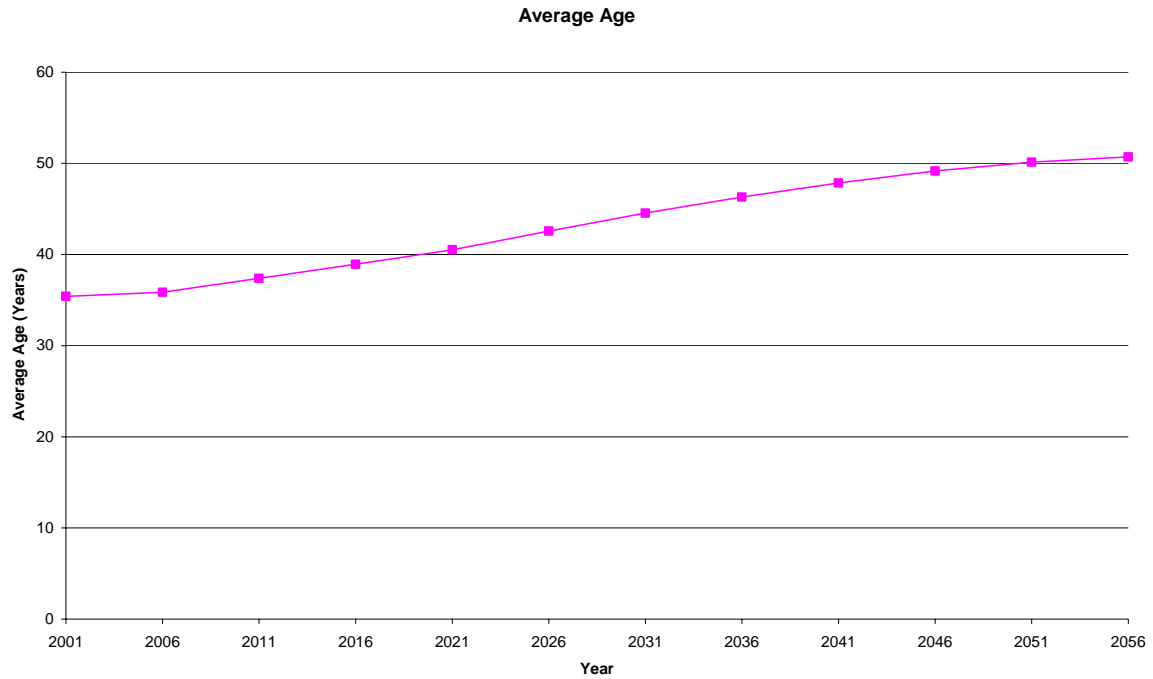
Net migration is assumed to be the remaining change in population following consideration of the change in total population, total births and total deaths. Net migration is shown in five year blocks in the graph that follows. The 'step' in 2021 is attributable to the district growth rate declining to 1% as previously discussed.



5.2.5 Ageing Population

It has been identified that the issue of an ageing population is significant. The following graphs identify how the population is ageing in the model.





Following are a number of tables. Table 5.1 shows the projected number of deaths for each area within the district for the next 50 years. Table 5.2 show the percentage of burials and the percentage of ash interments (It should be noted that in this instance the crematorium is assumed to be built in 2020) and table 5.3 shows the allocation of deaths in particular areas to cemeteries. Demand for space at the Lower Shotover cemetery is only as a result of other cemeteries reaching capacity.

	Number of Deaths																					
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Sunshine	8	9	9	9	9	9	10	10	10	10	11	11	11	12	12	12	13	13	14	14	15	16
QT Bay	14	14	15	15	15	15	16	17	18	19	20	21	23	24	26	28	30	30	32	34	35	37
Frankton Rd	8	8	9	9	9	10	10	10	10	10	11	11	11	12	12	12	13	13	13	14	15	15
Frankton Flats	9	10	11	12	13	15	16	17	17	18	19	20	20	21	22	22	23	23	25	26	27	29
Quail Rise	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Kelvin Heights	5	5	5	6	6	7	7	8	9	10	12	13	15	16	18	20	22	23	24	25	26	28
Arrowtown	10	10	10	10	10	10	10	11	11	11	11	11	11	12	12	12	13	13	13	14	15	16
Wakatipu	5	5	6	7	7	8	9	10	12	13	15	17	18	20	22	24	26	27	28	29	31	33
Millbrook	1	1	1	1	1	2	2	2	2	3	3	3	4	4	4	5	5	5	5	6	6	6
Arthurs Point	1	1	1	1	2	2	2	2	3	3	3	4	4	4	5	5	6	6	6	6	7	7
Wanaka Central	3	3	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	6	6
Wanaka West	4	4	5	5	5	5	6	6	6	7	7	7	7	8	8	8	8	8	9	9	10	10
Wanaka South	0	0	0	1	1	1	1	1	1	2	3	3	4	5	6	7	9	9	10	10	11	11
Beacon Point	10	10	11	11	12	13	14	15	15	16	17	18	19	19	20	20	21	21	22	23	25	26
Albert Town	2	2	3	3	3	3	3	3	4	4	4	4	5	5	5	5	5	5	6	6	6	7
Glenorchy - Site Specific	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Kingston - Site Specific	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
Hawea - CAU	6	6	6	7	7	7	8	8	8	9	9	10	10	11	11	12	12	13	13	14	15	15
Glenorchy - CAU (less Glenorchy + Kingston)	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Skippers - CAU (less Wakatipu + Millbrook + Quail Rise)	4	4	4	3	3	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Matukituki - CAU	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
Total Deaths	95	100	104	109	114	119	125	131	138	146	156	166	175	184	195	206	218	223	234	247	259	273

CAU = Census Area Unit

Table 5.1 Total Deaths

2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
17	18	18	19	20	21	23	24	25	26	28	29	30	32	34	35	37	39	41	43	46	48	50	53	56	59	62	65
39	41	43	45	48	50	53	55	58	61	64	68	71	75	79	83	87	91	96	101	106	112	118	124	130	137	144	151
16	17	18	19	20	21	22	23	24	26	27	28	30	31	33	35	36	38	40	42	44	47	49	52	54	57	60	63
30	32	33	35	37	39	40	43	45	47	49	52	55	58	60	64	67	70	74	78	82	86	91	95	100	105	111	116
3	3	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6	7	7	7	8	8	8	9	9	10	10
29	31	32	34	36	37	39	41	43	46	48	50	53	56	59	62	65	68	72	76	79	84	88	92	97	102	107	113
17	18	19	20	21	22	23	24	26	27	28	30	31	33	35	36	38	40	42	44	47	49	52	54	57	60	63	67
34	36	38	40	42	44	46	49	51	54	56	59	62	66	69	73	76	80	84	89	93	98	103	109	114	120	126	133
7	7	7	8	8	9	9	9	10	10	11	12	12	13	13	14	15	16	16	17	18	19	20	21	22	23	25	26
7	8	8	8	9	9	10	10	11	11	12	13	13	14	15	15	16	17	18	19	20	21	22	23	24	26	27	28
6	6	7	7	8	8	8	9	9	10	10	11	11	12	12	13	14	14	15	16	17	18	19	20	21	22	23	24
11	11	12	12	13	14	14	15	16	17	18	19	20	21	22	23	24	25	26	28	29	31	32	34	36	38	40	42
12	12	13	14	14	15	16	17	18	18	19	20	21	23	24	25	26	28	29	30	32	34	35	37	39	41	43	46
27	29	30	32	33	35	37	39	41	43	45	47	50	52	55	58	61	64	67	71	75	78	82	87	91	96	101	106
7	7	8	8	8	9	9	10	10	11	11	12	13	13	14	15	15	16	17	18	19	20	21	22	23	24	26	27
2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	7	8	8
4	4	4	4	4	4	5	5	5	5	6	6	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	11
16	17	18	19	20	21	22	23	24	25	27	28	29	31	33	34	36	38	40	42	44	46	49	51	54	57	60	63
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	4	4	4	4	4	5	5	5	5	6	6	6	7	7	7	8	8	9	9	9	10	10	11	12	13	14	
287	301	317	333	350	368	387	407	428	450	474	498	524	550	579	609	640	673	708	744	782	823	865	909	956	1,006	1,057	1,112

Table 5.1 Total Deaths continued

	Burial Percentage																					
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Ash internmant percentage	4.6%	4.8%	5.1%	5.3%	5.6%	5.9%	6.2%	6.5%	6.8%	7.1%	7.5%	7.9%	8.3%	8.7%	9.1%	29.4%	49.7%	70.0%	70.0%	70.0%	70.0%	70.0%
Ash internments - annual growth	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	223.0%	69.0%	40.8%	0.0%	0.0%	0.0%	0.0%
Other	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%

Table 5.2 Burial vs. Ash Interment Ratios

2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%

Table 5.2 Burial vs. Ash Interment Ratios continued

Note: These figures assume that a Crematorium has been constructed by 2020, which will further drive increasing trends away from burials to ash interments – from 2022 onwards it is assumed that 70% of interments will be for ashes.

Location of Death	Assignment of Deaths to Cemeteries											
	Albert Town	Arrowtown	Cardrona	Frankton	Glenorchy	Hawea	Kingston	Lower Shotover	Makarora	Queenstown	Skippers	Wanaka
Sunshine										100%		100%
QT Bay										100%		100%
Frankton Rd				50%						50%		100%
Frankton Flats				50%						50%		100%
Quail Rise				50%						50%		100%
Kelvin Heights				50%						50%		100%
Arrowtown		100%										100%
Wakatipu		50%								50%		100%
Millbrook		50%								50%		100%
Arthurs Point										100%		100%
Wanaka Central											100%	100%
Wanaka West											100%	100%
Wanaka South											100%	100%
Beacon Point											100%	100%
Albert Town	50%										50%	100%
Glenorchy - Site Specific					100%							100%
Kingston - Site Specific							100%					100%
Hawea - CAU						100%						100%
Glenorchy - CAU (less Glenorchy + Kingston)					33%		33%			33%		100%
Skippers - CAU (less Wakatipu + Millbrook)			50%							50%		100%
Matukituki - CAU											100%	100%

Table 5.3 Assignment of Deaths to Cemeteries

The results of the demand calculations for both burials and ash interments are as follows.

Demand - Burials													
	Albert Town	Arrowtown	Cardrona	Frankton	Glenorchy	Hawea	Kingston	Lower Shotover	Makarora	Queenstown	Skippers	Wanaka	
2005	1	14	0	11	0	6	2	0	0	38	0	19	90
2006	1	15	0	11	0	6	2	0	0	39	0	20	94
2007	1	15	0	12	0	6	2	0	0	41	0	21	98
2008	1	15	0	13	0	6	2	0	0	42	0	22	103
2009	1	15	0	14	0	7	2	0	0	44	0	23	107
2010	1	15	0	15	0	7	2	0	0	46	0	25	112
2011	2	16	0	16	0	7	2	0	0	48	0	26	117
2012	2	16	0	17	1	7	2	0	0	50	0	28	122
2013	2	16	0	18	1	8	2	0	0	52	0	29	128
2014	2	17	0	19	1	8	2	0	0	56	0	31	135
2015	2	18	0	20	1	9	2	0	0	59	0	33	143
2016	2	20	0	21	1	9	2	0	0	63	0	35	152
2017	2	21	0	22	1	9	2	0	0	66	0	36	160
2018	2	22	0	23	1	10	3	0	0	70	0	38	168
2019	2	23	0	24	1	10	3	0	0	74	0	39	176
2020	2	19	0	20	1	8	2	0	0	61	0	32	145
2021	1	14	0	15	0	6	1	0	0	46	0	24	109
2022	1	9	0	9	0	4	1	0	0	28	0	14	66
2023	1	9	0	9	0	4	1	0	0	30	0	15	69
2024	1	10	0	10	0	4	1	0	0	31	0	16	73
2025	1	10	0	10	0	4	1	0	0	33	0	17	76
2026	1	11	0	11	0	5	1	0	0	34	0	18	80
2027	1	11	0	12	0	5	1	0	0	36	0	19	85
2028	1	12	0	12	1	5	1	0	0	38	0	19	89
2029	1	12	0	13	1	5	1	0	0	40	0	20	93
2030	1	13	0	13	1	6	1	0	0	42	0	22	98
2031	1	14	0	14	1	6	1	0	0	44	0	23	103
2032	1	14	0	15	1	6	1	0	0	46	0	24	109
2033	1	15	0	16	1	6	1	0	0	49	0	25	114
2034	1	16	0	16	1	7	1	0	0	51	0	26	120
2035	2	17	0	17	1	7	1	0	0	54	0	28	126
2036	2	17	0	18	1	7	2	0	0	57	0	29	133
2037	2	18	0	19	1	8	2	0	0	60	0	31	140
2038	2	19	0	20	1	8	2	0	0	63	0	32	147
2039	2	20	0	21	1	9	2	0	0	66	0	34	154
2040	2	21	0	22	1	9	2	0	0	69	0	36	162
2041	2	22	0	23	1	10	2	0	0	73	0	37	171
2042	2	24	0	24	1	10	2	0	0	77	0	39	180
2043	2	25	0	26	2	11	2	0	0	81	0	41	189
2044	2	26	0	27	2	11	2	0	0	85	0	44	199
2045	3	27	0	28	2	12	2	0	0	89	0	46	209
2046	3	29	0	30	2	12	2	0	0	94	0	48	219
2047	3	30	0	31	2	13	2	0	0	99	0	51	231
2048	3	32	0	33	2	14	2	0	0	104	0	53	243
2049	3	33	0	35	2	14	3	0	0	109	0	56	255
2050	3	35	0	37	2	15	3	0	0	115	0	59	268
2051	3	37	0	38	2	16	3	0	0	121	0	62	282
2052	4	39	0	40	2	17	3	0	0	127	0	65	297
2053	4	41	0	42	2	18	3	0	0	133	0	68	312
2054	4	43	0	45	2	18	3	0	0	140	0	72	328
	93	1002	0	1028	49	434	92	0	0	3211	0	1668	7578

Table 5.4 Projected Demand (Burials)

It should be noted that this is purely demand, and is not constrained by limitations of space; hence there is no demand for Lower Shotover.

Demand - Ash Internments													
	Albert Town	Arrowtown	Cardrona	Frankton	Glenorchy	Hawea	Kingston	Lower Shotover	Makarora	Queenstown	Skippers	Wanaka	
2005	0	1	0	1	0	0	0	0	0	2	0	1	4
2006	0	1	0	1	0	0	0	0	0	2	0	1	5
2007	0	1	0	1	0	0	0	0	0	2	0	1	5
2008	0	1	0	1	0	0	0	0	0	2	0	1	6
2009	0	1	0	1	0	0	0	0	0	3	0	1	6
2010	0	1	0	1	0	0	0	0	0	3	0	2	7
2011	0	1	0	1	0	0	0	0	0	3	0	2	8
2012	0	1	0	1	0	1	0	0	0	3	0	2	8
2013	0	1	0	1	0	1	0	0	0	4	0	2	9
2014	0	1	0	1	0	1	0	0	0	4	0	2	10
2015	0	2	0	2	0	1	0	0	0	5	0	3	12
2016	0	2	0	2	0	1	0	0	0	5	0	3	13
2017	0	2	0	2	0	1	0	0	0	6	0	3	14
2018	0	2	0	2	0	1	0	0	0	7	0	4	16
2019	0	2	0	2	0	1	0	0	0	7	0	4	18
2020	1	8	0	8	0	3	1	0	0	26	0	13	61
2021	1	14	0	15	0	6	1	0	0	46	0	24	109
2022	2	20	0	21	1	9	2	0	0	67	0	34	156
2023	2	22	0	22	1	9	2	0	0	70	0	36	164
2024	2	23	0	23	1	10	2	0	0	74	0	38	173
2025	2	24	0	25	1	10	2	0	0	77	0	40	181
2026	2	25	0	26	1	11	2	0	0	81	0	42	191
2027	2	26	0	27	1	11	3	0	0	86	0	44	201
2028	3	28	0	29	1	12	3	0	0	90	0	46	211
2029	3	29	0	30	1	12	3	0	0	95	0	49	222
2030	3	31	0	32	1	13	3	0	0	100	0	51	233
2031	3	32	0	33	2	14	3	0	0	105	0	54	245
2032	3	34	0	35	2	15	3	0	0	110	0	57	258
2033	3	36	0	37	2	15	3	0	0	116	0	59	271
2034	3	37	0	39	2	16	3	0	0	122	0	62	285
2035	4	39	0	41	2	17	3	0	0	128	0	66	300
2036	4	41	0	43	3	18	4	0	0	134	0	69	315
2037	4	43	0	45	3	19	4	0	0	141	0	73	331
2038	4	46	0	47	3	20	4	0	0	149	0	76	349
2039	4	48	0	50	3	21	4	0	0	156	0	80	366
2040	5	50	0	52	3	22	4	0	0	164	0	84	385
2041	5	53	0	55	3	23	4	0	0	173	0	89	405
2042	5	56	0	58	3	24	5	0	0	182	0	93	426
2043	5	59	0	61	4	25	5	0	0	191	0	98	448
2044	6	62	0	64	4	27	5	0	0	201	0	103	471
2045	6	65	0	67	4	28	5	0	0	211	0	109	495
2046	6	68	0	71	4	29	5	0	0	222	0	114	521
2047	7	72	0	75	4	31	6	0	0	234	0	120	548
2048	7	75	0	78	4	32	6	0	0	246	0	126	576
2049	7	79	0	82	5	34	6	0	0	259	0	133	605
2050	8	83	0	87	5	36	6	0	0	272	0	140	637
2051	8	88	0	91	5	38	7	0	0	286	0	147	669
2052	9	92	0	96	5	40	7	0	0	301	0	155	704
2053	9	97	0	101	5	42	7	0	0	316	0	163	740
2054	9	102	0	106	6	44	7	0	0	333	0	171	778
	159	1727	0	1792	97	742	144	0	0	5623	0	2890	13173

Table 5.5 Projected Demand (Ash Internments)

The date when (and if) a Crematorium will be constructed within the district has a significant impact on how existing cemetery space will be consumed. Sensitivity analysis on this variable has been carried out and the results of this are displayed graphically in section 5.3 for each cemetery, and the district as a whole. Section 5.3 also takes capacity into consideration, with excess demand being absorbed by the Lower Shotover cemetery.

5.2.6 Assumptions

The following significant assumptions were made in modelling the projected number of deaths and demand for cemetery space:

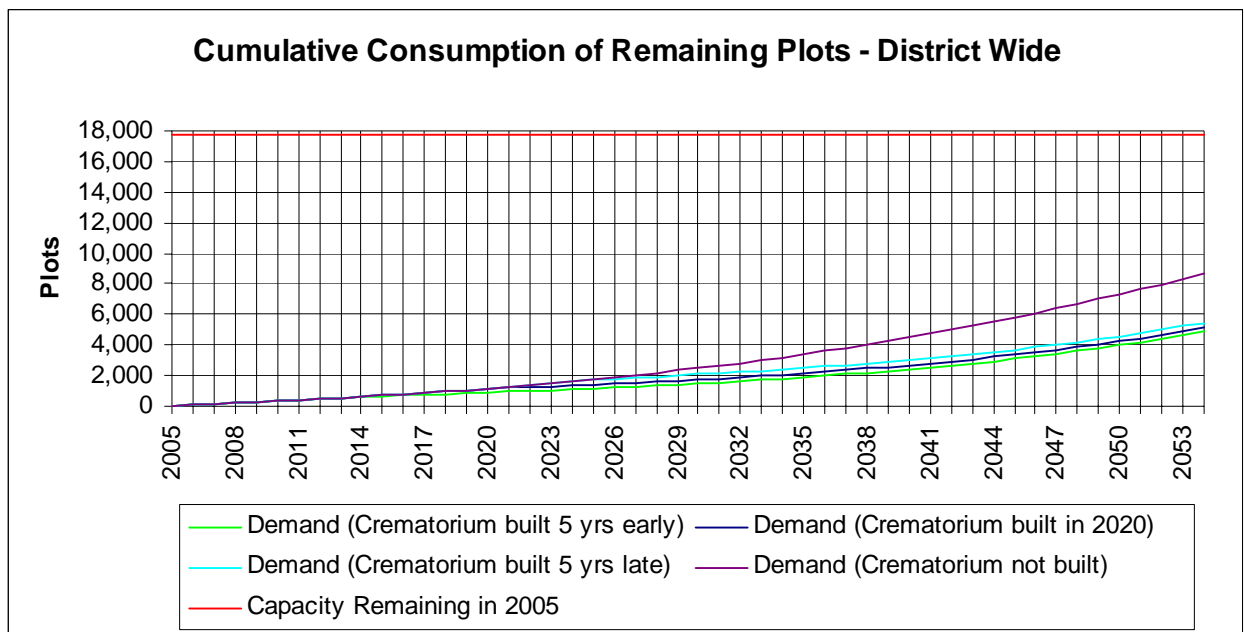
- The growth rate assumed post 2021 is 1%. Where information exists to suggest a growth rate other than 1%, this has taken precedence.
- A crematorium will be constructed in 2020. Sensitivity analysis on the demand for cemetery space has been performed around this variable and the results are shown graphically in section 5.3.
- In the three year period following the construction of a crematorium, 70% of deaths will be ash interments. This assumption is based on guidance provided by Russell McGrouther, and experiences following construction of a crematorium in Oamaru.
- ½ % of deaths will not fall into the category of burial or ash interments. Put differently, they die, but consume no cemetery space e.g. some people will scatter ashes.
- The number of people who die within the district but are buried outside equals the number who die outside the district but are buried within. This assumption is based on guidance provided by Russell McGrouther and Don McKinley.
- Each burial plot is the equivalent to eight ash interment plots. This follows guidance provided by Russell McGrouther. It is assumed that undeveloped plots could be developed into either burial or ash interment plots as demand dictates.
- 80% of plots (either burial or ash interments) at capacity will hold two people, with the remainder holding one.
- Where a plot was first occupied more than 20 years ago, it is assumed that that plot will not receive a second burial or ash interment. In calculating the number of plots with two burials or ash interments, and the availability for occupied plots to receive a second burial or ash interment, ratios calculated from Wanaka cemetery data have been applied.

5.3 Cemetery Capacity Projections

The graphs that follow show the consumption of cemetery space over time for four different scenarios, based on when the construction of a crematorium will occur. Elsewhere in the calculations it has been assumed the crematorium will be constructed in 2020. In addition to 2020, the other scenarios graphed are 2015, 2025 and the crematorium not constructed.

Consumption of space is considered for the district as a whole below, and then for each cemetery individually in the sub-sections that follow.

The Cemetery Planning Manual has been used to determine standard plot sizes and capacity per hectare.

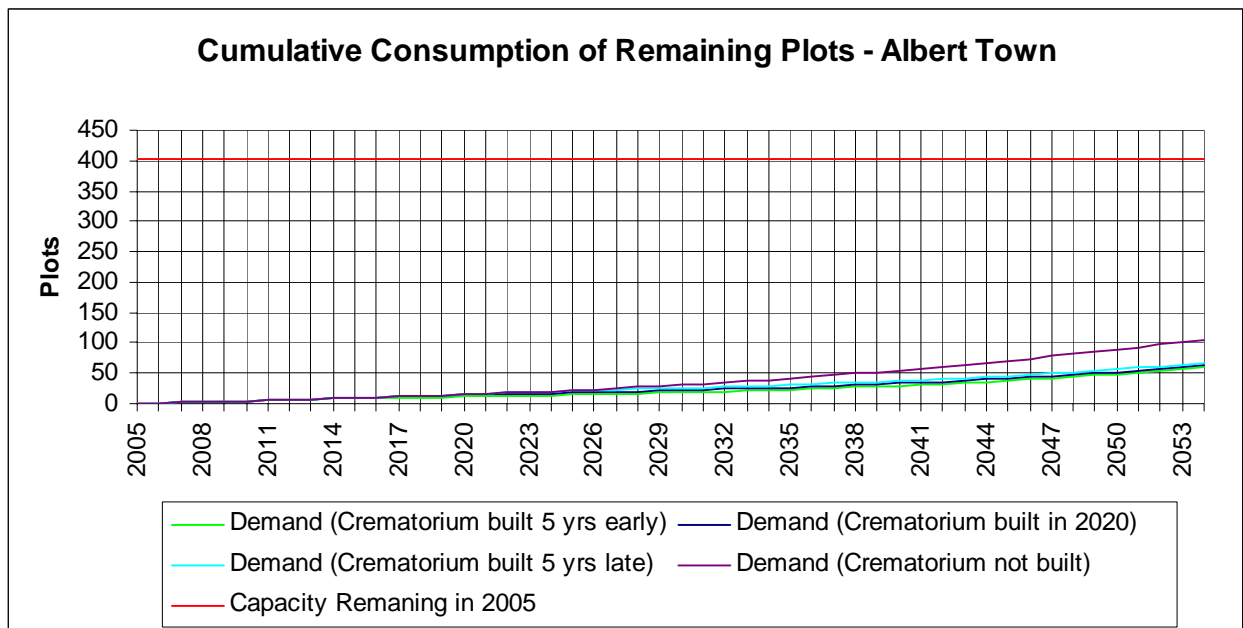


This graph demonstrates that over all, the district is well provided for cemetery space to cater for projected needs over the next 50 years and beyond.

5.3.1 Albertain Cemetery



Fig 5.3.1 Albertain Cemetery

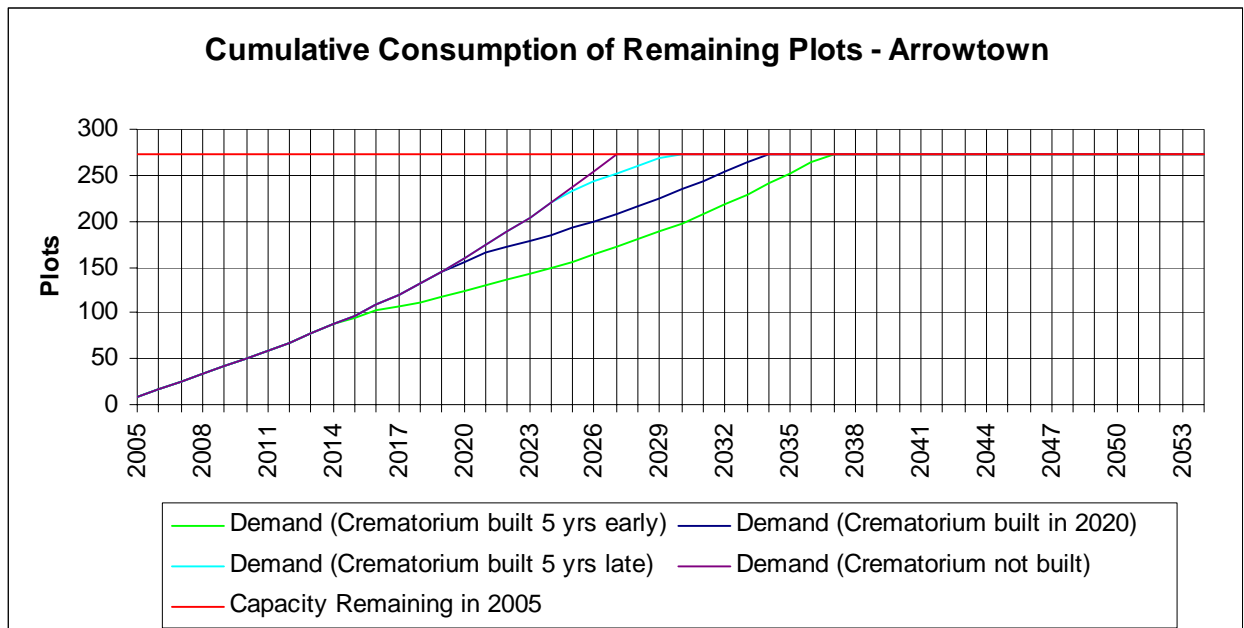


In 1878 the Clutha flooded and washed away many headstones. These were gathered up and in 1962 a memorial was erected in their place. Grave testing will be required to accurately determine current usage and space available. Otherwise, Albertain Cemetery has sufficient space to cater well beyond the 50 year projection used in this strategy.

5.3.2 Arrowtown Cemetery



Fig 5.3.2 The old part of Arrowtown Cemetery



The remaining life of Arrowtown Cemetery available for interments is projected to last until 2027-2037. This is assuming the development of all available land suitable for interments. Once full, interments will then occur at the Lower Shotover Cemetery.



Fig 5.3.3 Arrowtown Cemetery gates and ornamental stone wall

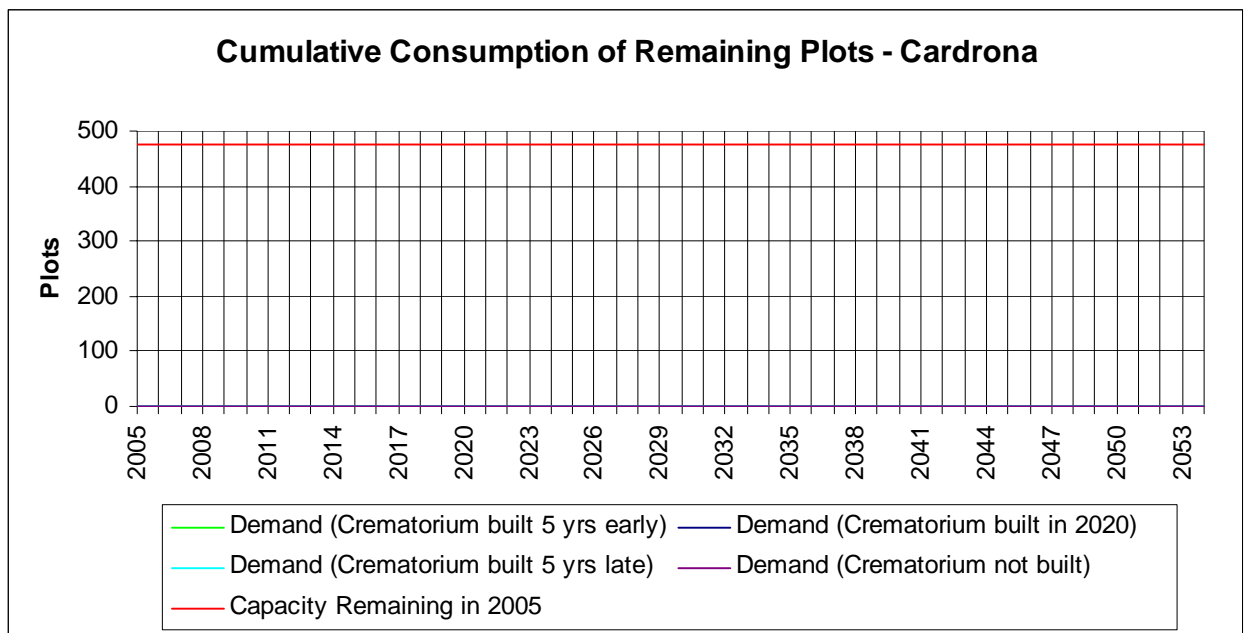


Fig 5.3.4 Newly developed area of Arrowtown Cemetery

5.3.3 Cardrona Cemetery



Fig 5.3.5 Cardrona Cemetery

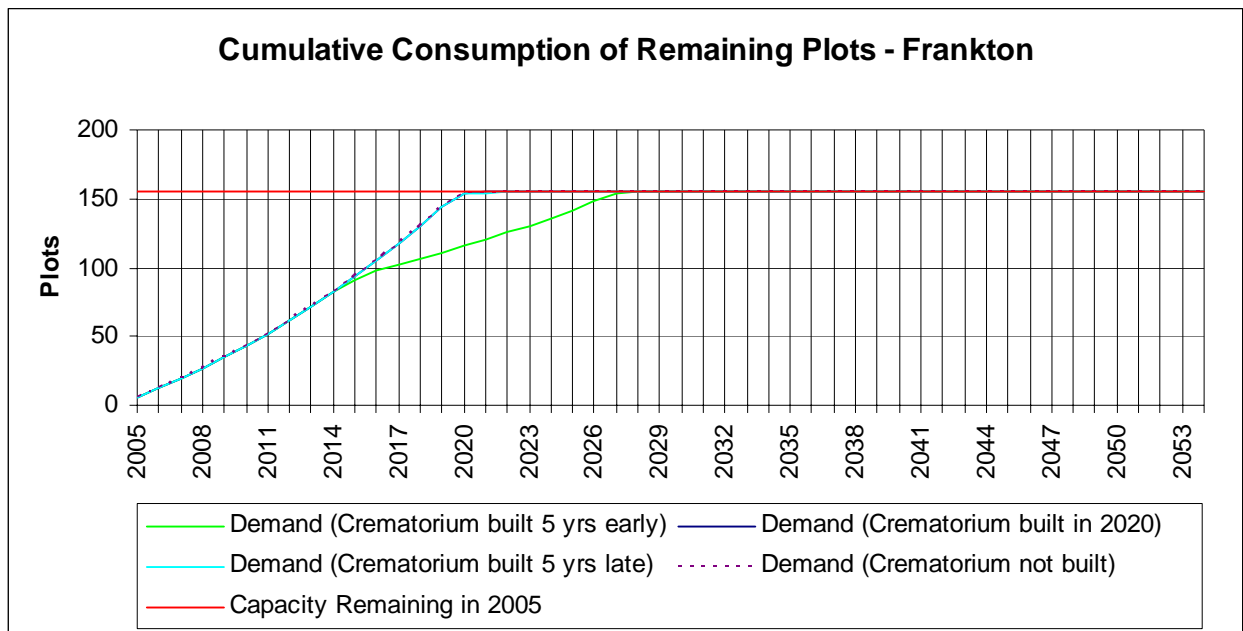


As explained at the start of this section, demand for interments at Cardrona Cemetery is so low as to not warrant calculation. It has remaining capacity for approximately another 470 burials.

5.3.4 Frankton Cemetery



Fig 5.3.6 Frankton Cemetery gate



Frankton Cemetery is nearing the end of its useful life, and only has sufficient space to cater for further interments until 2020. Interments will then occur in Lower Shotover Cemetery instead.

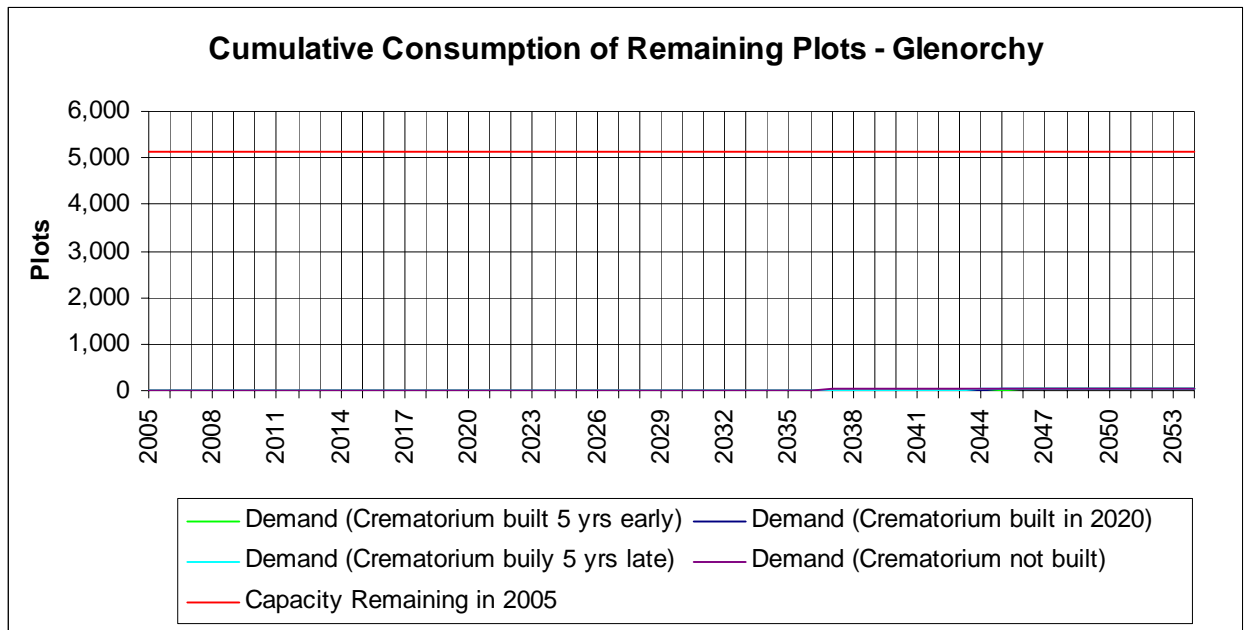


Fig 5.3.7 Ash plots along the Frankton Cemetery wall

5.3.5 Glenorchy Cemetery



Fig 5.3.8 The developed part of Glenorchy Cemetery



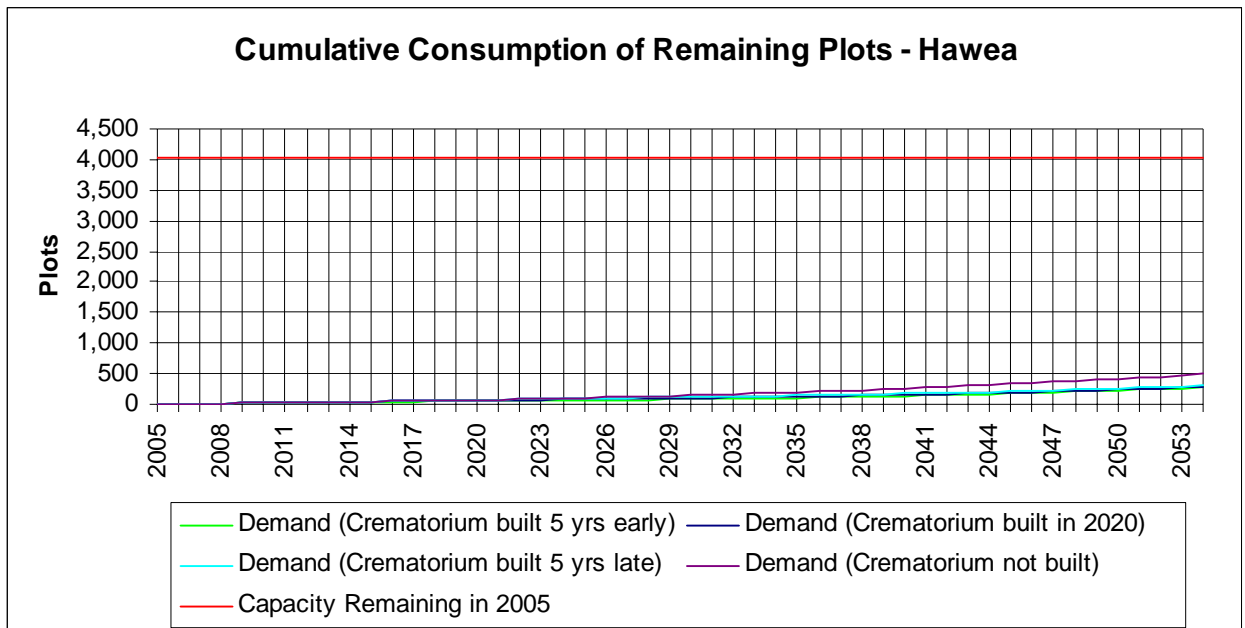
Glenorchy Cemetery is very large, and contains 5.3 hectares of land for burials. It has capacity to cater for more than 5000 more burials if all areas are developed – the vast majority of the site is currently grazed.

5.3.6 Hawea Cemetery

It is intended that Hawea Cemetery remain under management of the Hawea Cemetery Trust. However it is prudent that Queenstown Lakes District Council consider supply and demand needs for its entire district, which includes Hawea.

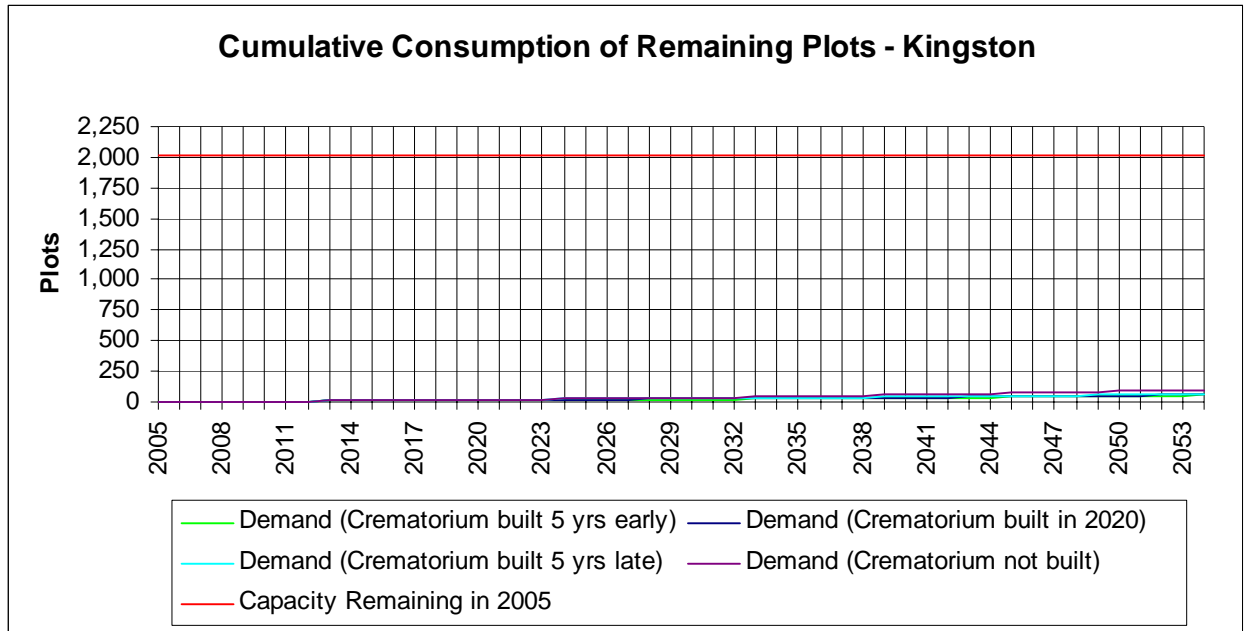


Fig 5.3.9 Hawea Cemetery



As can be seen from this graph, there is ample room available to cater well beyond the 50 year projection used in this strategy. Hawea Cemetery is quite large at just over 4 hectares, much of which has yet to be developed.

5.3.7 Kingston Cemetery

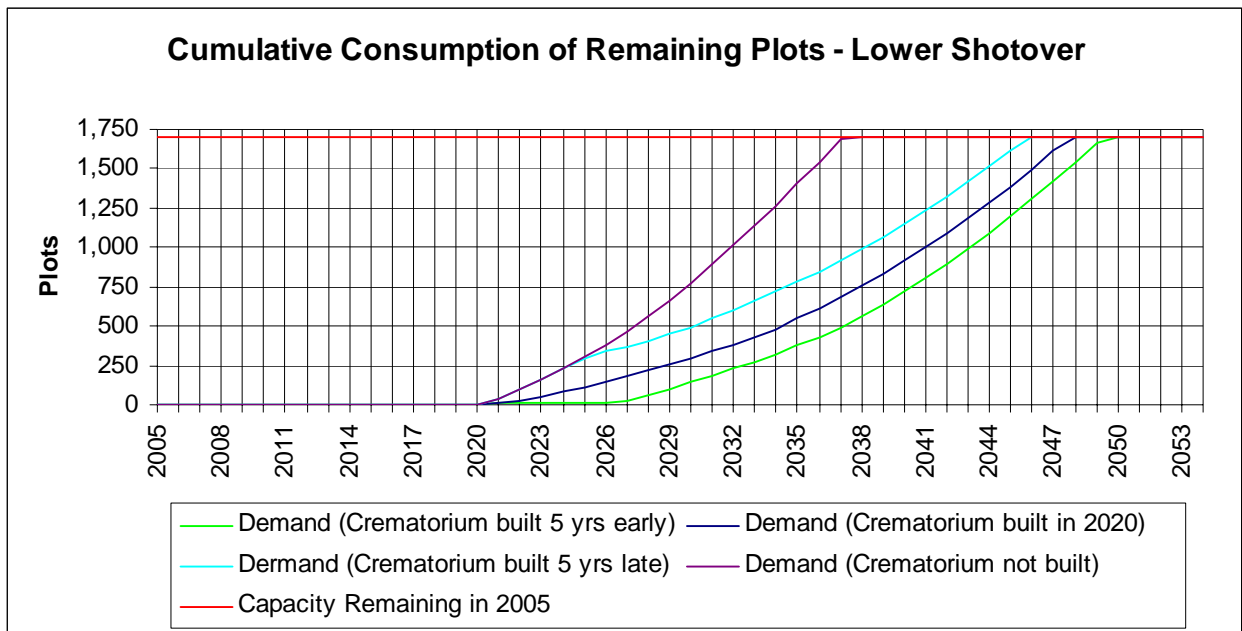


Like Glenorchy Cemetery, Kingston Cemetery contains an excessive amount of land given the projected interments for the local area.

5.3.8 Lower Shotover Cemetery



Fig 5.3.10 Entrance to Lower Shotover Cemetery

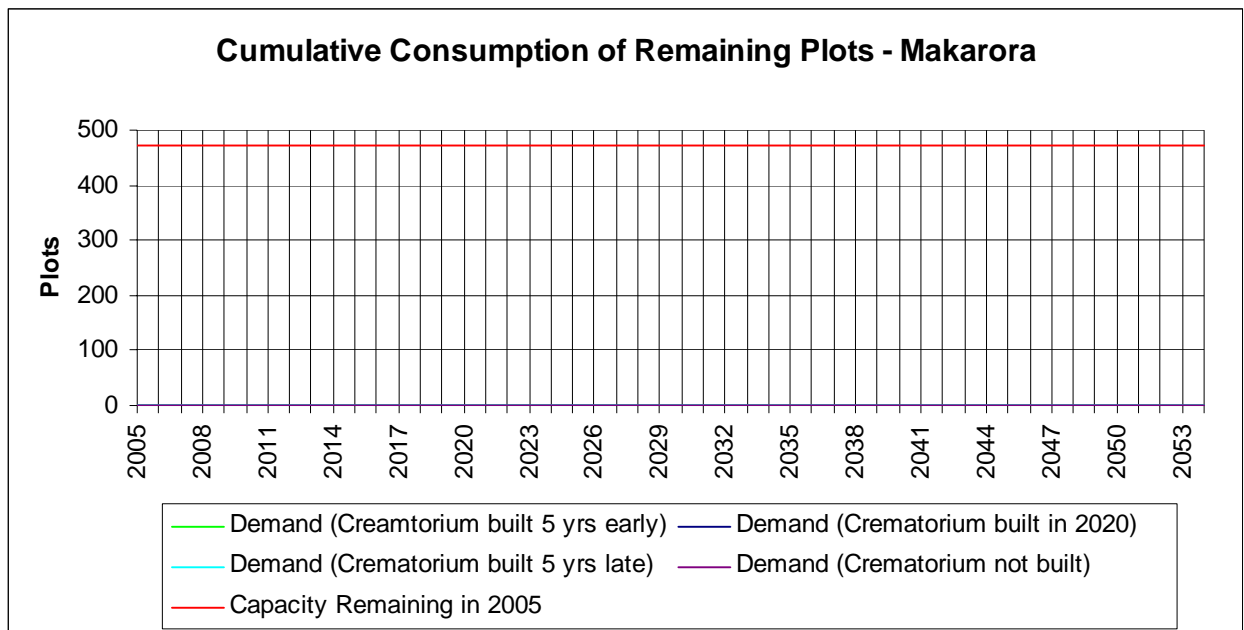


It should be recognised that in modelling demand for cemetery space the excess demand for space at the Lower Shotover Cemetery has not been attributed to any other cemetery. Arrowtown, Frankton and Queenstown cemeteries are all anticipated to reach capacity long before capacity is of any concern at Lower Shotover. However all opportunities for adding adjacent land to the Lower Shotover Cemetery should be explored to extend the life of this cemetery once the Arrowtown, Frankton and Queenstown Cemeteries have reached their capacity.

5.3.9 Makarora Cemetery



Fig 5.3.11 Entrance gate to Makarora Cemetery

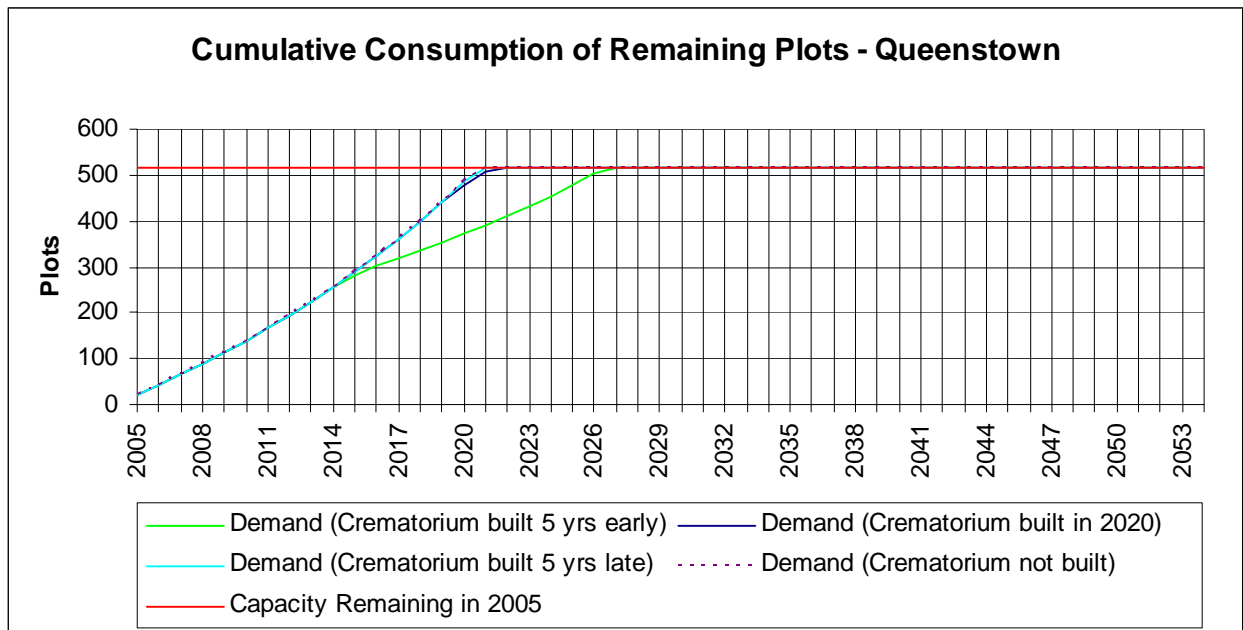


As explained at the start of this section, demand for interments at Makarora Cemetery is so low as to not warrant calculation. Currently only a small portion is developed, with the majority grazed.

5.3.10 Queenstown Cemetery



Fig 5.3.12 The old part of Queenstown Cemetery



Queenstown Cemetery, assuming the use of the currently undeveloped area, only has capacity to cater until 2021. Burials that would then normally be undertaken at Queenstown Cemetery will be undertaken in Lower Shotover Cemetery instead.

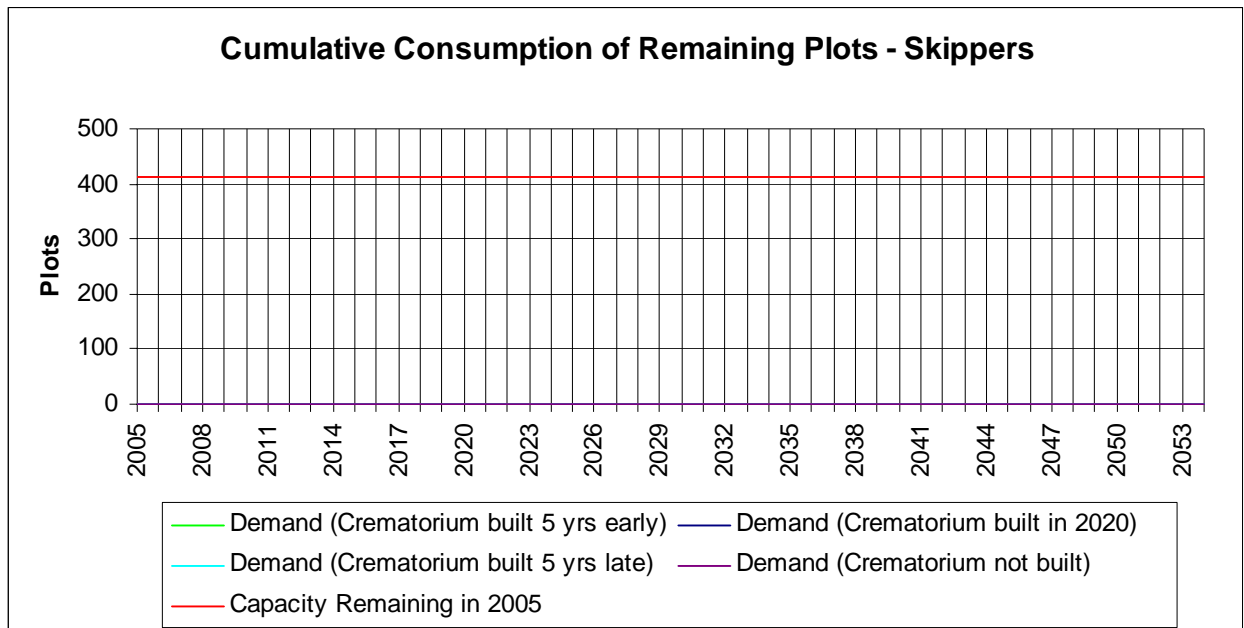


Fig 5.3.13 Looking towards the last section of Queenstown Cemetery to be developed

5.3.11 Skippers Cemetery



Fig 5.3.14 Entrance gate to Skippers Cemetery



As explained at the start of this section, demand for interments at Skippers Cemetery is so low as to not warrant calculation.

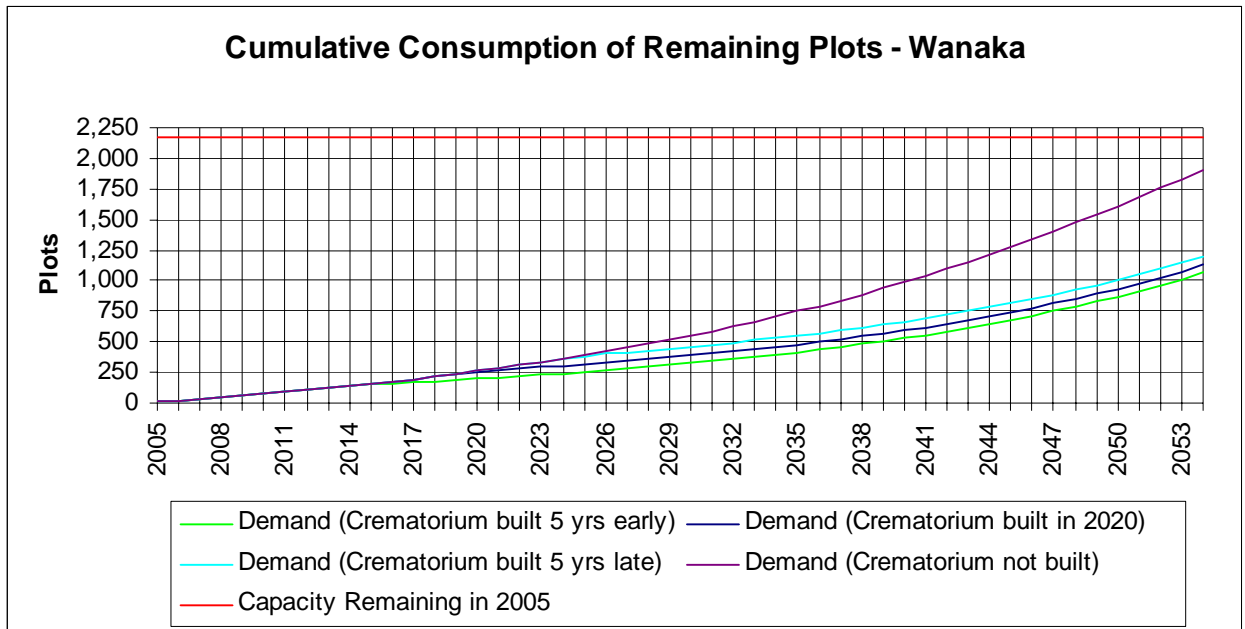


Fig 5.3.15 Skippers Cemetery

5.3.12 Wanaka Cemetery



Fig 5.3.16 Wanaka Cemetery



Based on these projections, the land set aside for cemetery purposes at Wanaka will cater for demand for at least the next 50 years.

6.0 CEMETERY CONSERVATION AND DEVELOPMENT PLANS

6.1 District Cemeteries Conservation Plan

Given the value of some of the cemeteries in the district, the development and implementation of a District Conservation Plan would be appropriate to ensure that these sites retain their aesthetic, social, cultural, and historical importance with the community and visitors to the district.

The recommended cemeteries to be included in the plan would be:

- Queenstown Cemetery
- Arrowtown Cemetery
- Frankton Cemetery

The Conservation Plan should contain the following elements:

- Introduction – purpose, conservation principles, values (historic, social, cultural, aesthetic etc), legislative framework etc
- Management policies – levels of service, heritage protection, landscape protection, funding, remedial work, maintenance, vegetation management, interpretation etc.
- Separate section on each cemetery covering
 - Legal and physical description
 - History
 - Landscape assessment and development plan
 - Implementation plan, including specific recommendations on maintenance and restoration, vegetation management, security, facilities and visitor interpretation.
- Specifications and standards for physical works.

6.2 Cemetery Development Plans

To date cemetery development plans have been produced for Wanaka and Makarora Cemeteries.

It would be ideal to eventually have development plans for all cemeteries, as these documents are important tools to ensure that cemetery operation and development occurs in a planned way. Asset management is also more predictable. The process of their development provides an effective way of engaging the communities of interest, ensuring their support and participation in their cemetery. Well developed cemeteries are generally also cheaper to maintain.

It is proposed that plans be produced as resources allow, according to the following priorities:

- Priority one – Cemeteries covered by Cemetery Conservation Plan – Queenstown, Arrowtown, Frankton
- Priority two – Cemeteries with projected high demand – Lower Shotover
- Priority three – all other cemeteries

7.0 RECOMMENDATIONS

- That this strategy be reviewed at least every 10 years. Should a cremator be built during this period, an earlier review is recommended.
- That a study be undertaken to determine if the district is able to sustain a crematorium, and when the most effective time would be to have it constructed. The assumption is that the crematorium would be a private sector initiative, but encouraged by Council.
- That undeveloped areas of cemeteries be developed in a planned way to allow the full use of each site
- That when cemeteries reach their capacity, burials are instead undertaken at the nearest available cemetery.
- That the Hawea Cemetery Trust continues to manage the Hawea Cemetery for as long as they are willing. This should be reviewed if Hawea Cemetery is required to accept burials previously undertaken at a Council managed cemetery.
- That the Lower Shotover Cemetery remains unused until it is required to receive interments previously accommodated at other cemeteries (Arrowtown, Frankton and Queenstown).
- That a Cemetery Conservation Plan be developed for the district to include Queenstown, Arrowtown and Frankton Cemeteries.
- That Cemetery Development Plans be produced for all cemeteries in order of priority.