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# Victorian Cremation Industry Viability

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Report prepared by *Marsden Jacob Associates*  
In conjunction with *Spatial Vision* and *Cumpston Sarjeant Truslove*  
For the *Department of Human Services* (Victoria)



**Cumpston Sarjeant Truslove Pty Ltd**  
Consulting Actuaries

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# Executive Summary

Recommendations are included in the main body of the report with supporting arguments and are repeated in the Executive Summary. Note, however these Recommendations should be considered in the context of where they arise in the main body of the report.

## 1 Objectives, Approach & Background – p. 1

1. The review had two broad aims:
  - Investigate the economic returns from Victorian crematoria and report on the current financial state of the Victorian ‘cremation industry’.
  - Provide a clear basis for the Department to evaluate proposals from Cemetery Trusts to establish new crematorium facilities.
2. Cremation services are provided as one of a number of products and services supplied by Victorian Cemetery Trusts. Separation for accounting purposes appears to be rare and inconsistent.

## 2 Methodology – p. 4

3. The approach undertaken comprised a series of inter-related analyses:
  - The viability of crematoria and the crematoria industry reflects the expected revenue and costs for each crematorium and in aggregate.
  - Our approach is to examine the likely range of demand for cremation services for existing crematoria and for potential ones. This required analysis of cremations (and deaths) on a spatial basis.
  - To analyse the viability we have developed a financial model for each crematorium and the industry. To examine viability through a full cycle of expected the life of the key components of the industry, we have used a 50 (approximately) timeframe.
  - The model, cremation forecasts and spatial analysis provide the basis for evaluation of the viability of the industry and individual crematoria.
  - In addition, the three components allow evaluation of a number of specific anticipated crematoria.
4. In examining potential entrants, the first hurdle for any proposal is an evaluation of the financial viability of the proposal with regard to the proponent (i.e., in isolation to other existing service providers).
5. The second hurdle for any proposal is the impact of entry on the returns to the Victorian cemetery industry (Victorian Cemetery Trusts) as a whole.
6. The analysis does not however model the interaction between cremation and burials.

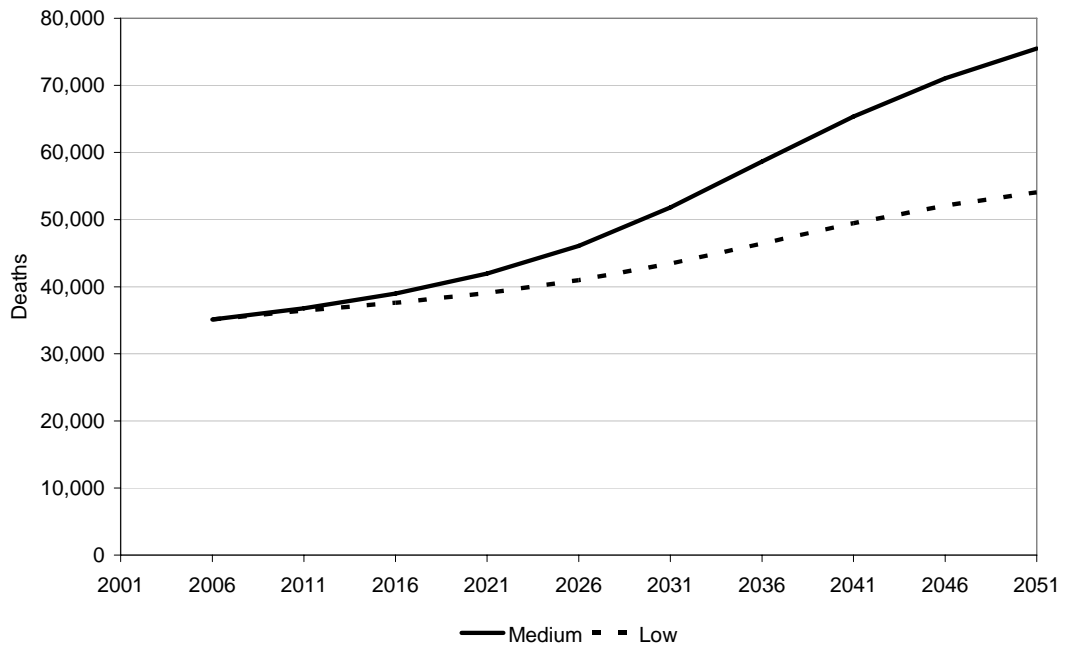
7. In evaluating both the viability of existing crematoria and the impacts of entry we have primarily used information derived from the cash flows for the crematoria. The main financial measures used are the Internal Rate of Return and their net cash balances. The former allows some comparability across entities as well as meeting hurdle rates of return. The latter also provides an insight into the contribution of the industry to overall reserves of the Trusts.
8. For the purposes of this analysis the likely opportunity cost of capital for crematoria projects is bounded by the risk free rate of return (approximately 6%) and the market rate of return for an average investment (approximately 10%).

### 3 Analysis of Demand for Cremation Services in Victoria – p. 12

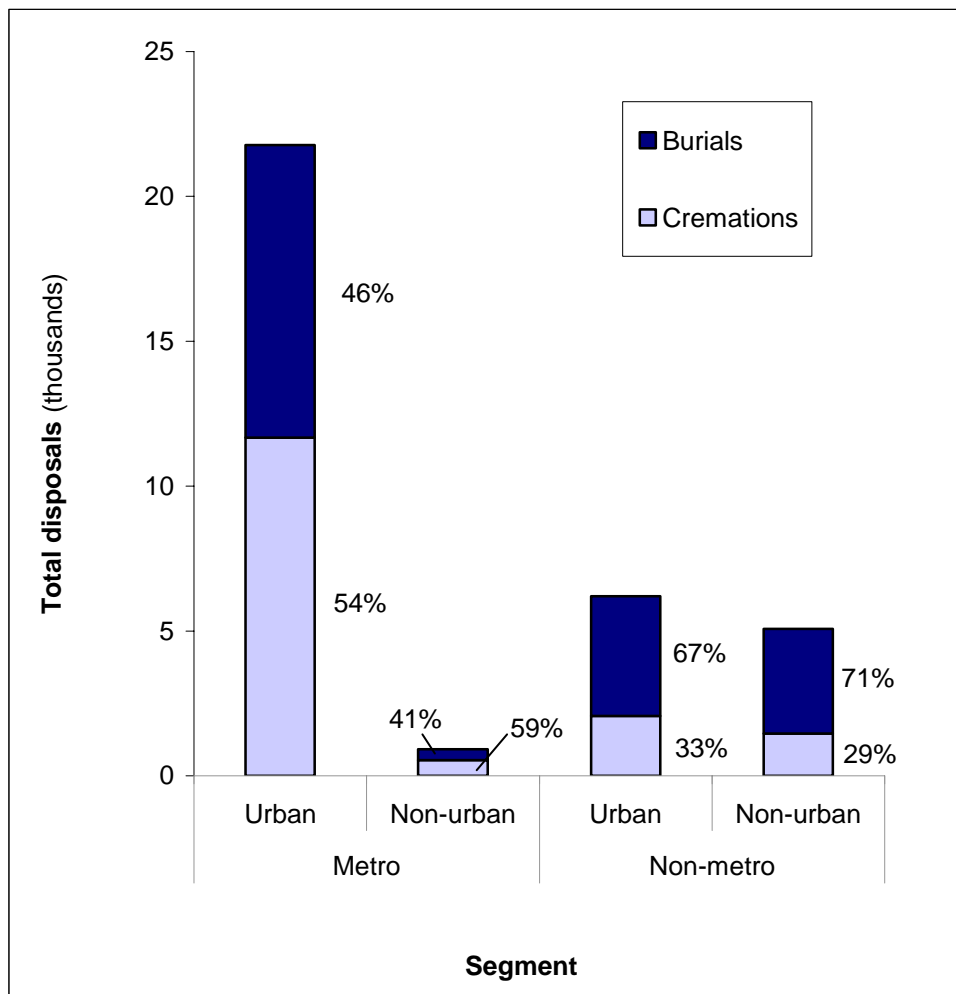
9. The funeral director can generally be regarded as the ‘customer’ when it comes to purchasing cremation (and burial) services, and the bereaved or deceased can be regarded as the ‘consumer’. From the consumer’s viewpoint, cremation charges and services are bundled with other services provided by funeral directors.
10. The cremation price is a small proportion of the overall cost to the bereaved and is consequently unlikely to affect the burial/cremation decision. The bereaved are generally more concerned with the total package price.
11. However, the choice of cremation may affect returns to funeral directors may be likely to encourage the bereaved to choose the method of disposal that maximises their returns. In addition, funeral directors may build relationships with individual service providers that can influence their recommendations.
12. As a result, the interaction between cremation charges and demand is not direct nor simple. However, total charges for a cremation-based service are likely to be significantly lower than those for a burial. This differential may be greater when memorialisation costs (headstones versus urns) is taken into account.
13. The expected number of deaths in Victoria is expected to increase slowly over the next fifteen years. We have used two death projections which are consistent with the two ‘likely’ ABS’ projections: a low and a medium projection. The low projection forecasts around 54,000 deaths by 2051 and the medium, around 75,500 deaths in that year. For the purposes of the base analysis, we have used the medium projection which is also used for forecasting purposes by a number of government departments including the Department of Infrastructure.



14. Forecast Deaths in Victoria (per annum) 2006 to 2051.



15. In 2002, there were around 16,300 cremations of Victorians. This represents slightly in excess of 46% of Victorian deaths.



16. Over 95% of these cremations were undertaken in Victorian facilities. Victoria may be characterised as a generally self-contained market, with only limited interaction along state borders.
17. Around three-quarters of these cremations were from urban metropolitan residents with the total urbanised areas of Victoria contributing nearly 90% of the demand for cremations. These areas will continue to be the focus of Victoria's population growth, and consequently deaths, into the future.
18. Analysis of the spatial distribution of cremations indicates that the proximity of cremation facilities is likely to increase the rate of cremation in a geographical region.
19. However, in the metropolitan region, there is only minimal scope for increased rates of cremation in any area. The analysis found that proximity was not the fundamental cause for those areas with lower cremation rates. In metropolitan areas, the average cremation rate is 54% but is likely to rise to only 55% with greater access to facilities. Even under exceedingly optimistic assumptions, this rate is only likely to reach 60%.

20. In non-metropolitan areas, there is significantly greater scope for increased cremation. Increased access is likely to increase the cremation rate from 31% to 36%. Under optimistic assumptions, this could reach 41%. However, it is important to remember that though there is significant potential for a higher **rate** in non-metropolitan areas, these areas are not heavily populated.

21. Reflecting the increase in deaths, the demand for cremations is expected to expand significantly over the next 50 years. Assuming mortality rates continue as expected and current cremation rates continue unchanged total demand for cremations in Victoria is expected to more than double growing from almost 16,000 per annum in 2001 to over 35,000 per annum in 2051.

22. The range of forecast cremations for selected years is shown

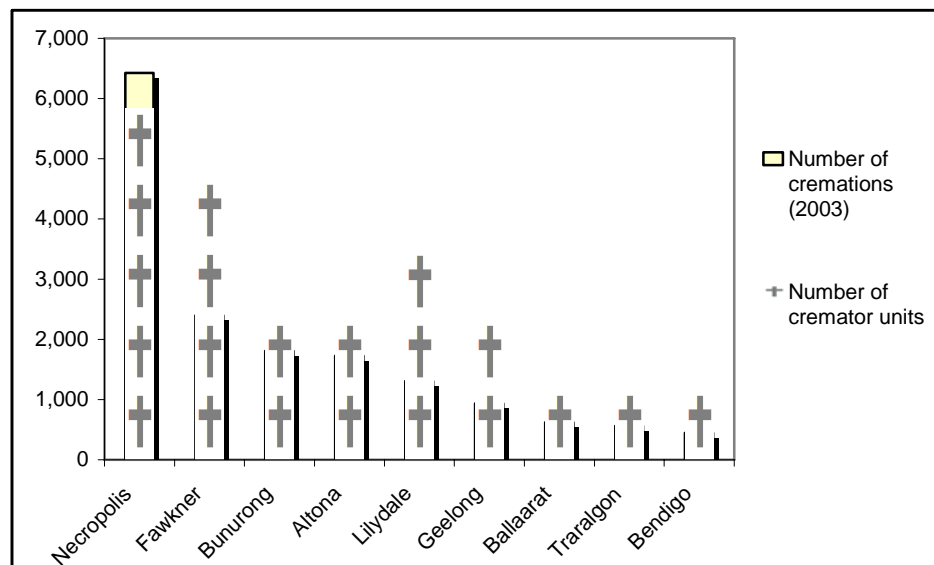
Year	Low Cremation (current)		Medium Cremation		High Cremation	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	16,179	16,179	16,955	16,955	18,665	18,665
2026	21,395	18,997	22,577	20,059	24,799	22,042
2051	35,257	25,193	37,420	26,704	41,037	29,297

23. The spatial analysis relies critically on data from the Victorian Registry of Births, Deaths and Marriages. In moving forward with this analysis, it is important that this data source be dependable.

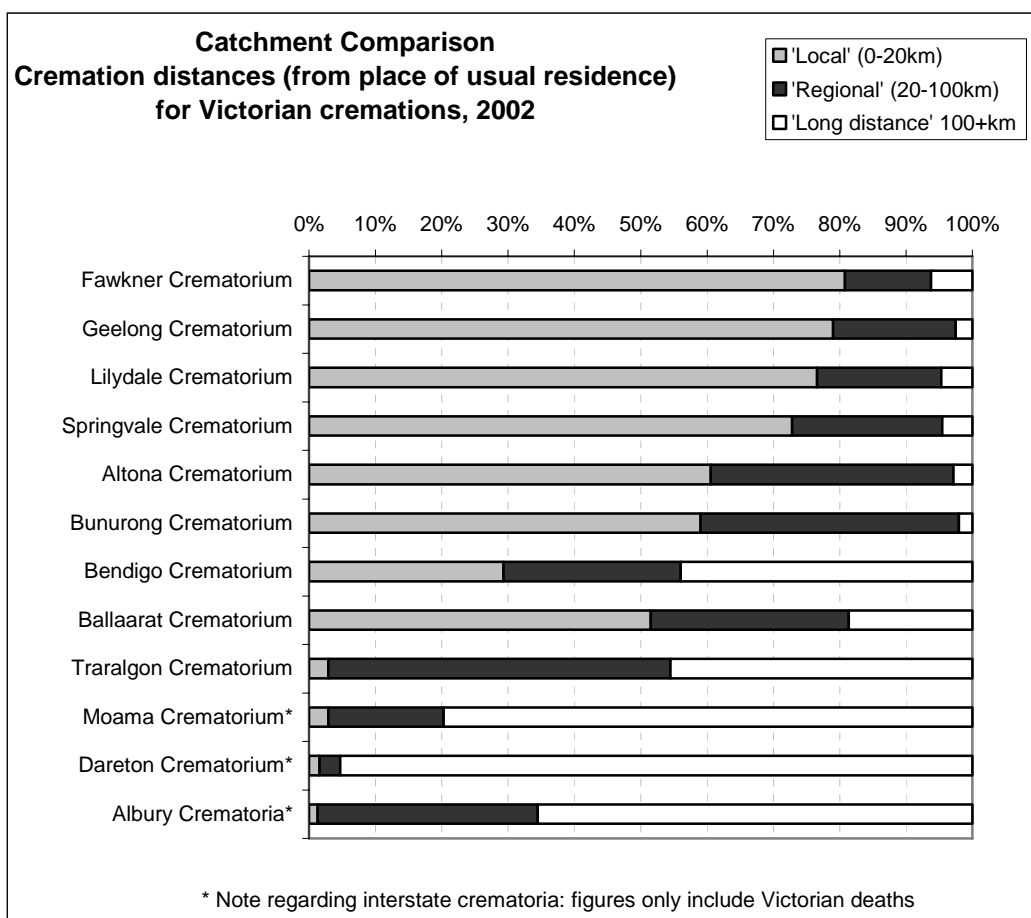
**Recommendation 1 – That, given to the very high strategic value to the death care industry of information compiled from death certificates, the Department may wish to consider working with the Victorian Registry of Births, Deaths and Marriages to improve the nature, quality and access arrangements for this information for future planning purposes. (Page 15)**

#### 4 Analysis of Supply of Cremation Services in Victoria – p. 26

24. Victoria’s nine crematoria operate 21 cremator units across the State and perform cremations as follows:

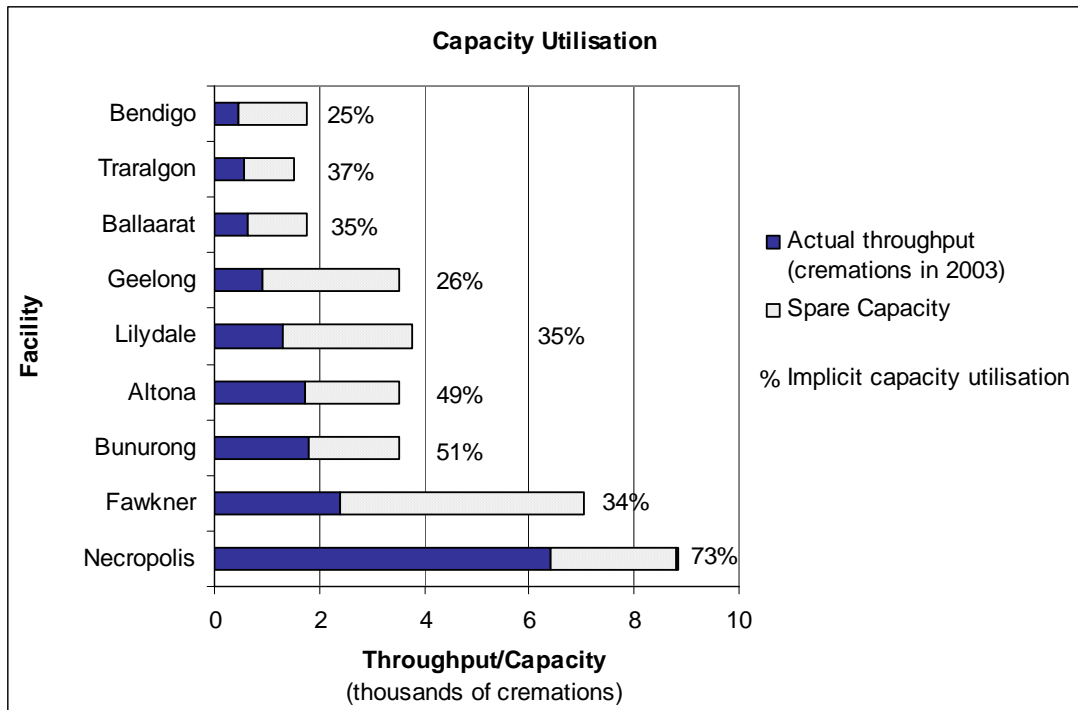


25. The three regional crematoria of Ballaarat, Bendigo and Traralgon are distinct from the six metropolitan facilities. Metropolitan crematoria have multiple cremator units, provide ancillary services, have many dedicated staff and face significant competition. In contrast, the regional crematoria operate lower throughput single cremator units with 1-2 staff on a part-time basis, service very large geographic catchments and experience virtually no competition.
26. Distances of cremation from place of usual residence vary greatly, and are, not surprisingly, greater for the regional crematoria. Metropolitan crematoria obtain half of their demand from persons who previously resided within 20km of the facility. For Victorian regional facilities this median distance was in the range of 20 to 50 km.



27. The industry has the capacity to undertake, in aggregate, well in excess of 30,000 cremations per annum at standard operational practices. Given the projected cremations for Victoria in 2051 range from 25,193 to 41,037 (which represents an unlikely high scenario), it is clear that there is sufficient capacity within the current industry to cope with virtually all of the expected growth in demand for at least the next 45 to 50 years. Under the equally likely scenario of numbers of deaths and proportion cremated (Low mortality low cremation), the number of cremations is unlikely to reach 30,000 until at least 2080.

28. Reflecting this outlook, almost all crematoria are currently operating around one-quarter to one-half capacity.



29. Disregarding geographic factors (such as transport costs), a very few cremators could handle the entire Victorian *existing* demand. Indeed, even if all burials were to cease and were to be replaced by cremation, there is currently sufficient installed capacity to handle all Victorian deaths within the indicative capacity outlined above. The table shows the number of cremator units required to meet current Victoria cremations assuming different number of shifts per day.

<i>Number of shifts per day</i>	<i>Number of cremator units required</i>
Standard 8 hour shift	9
Two x 8 hour shifts	5
24 hour operation (three x 8 hour shifts)	3

## 5 Elements of Crematorium Viability – p. 39

30. This analysis focusses on the direct costs of cremation and cremation services and an allocation of common costs. In general, we have followed the allocations provided by each Cemetery Trust as their best allocation of these common costs.

31. A narrow economic model of cremation viability would focus on the costs incurred and revenues gained solely attributable to the cremation process. However, this is likely to significantly understate the impact of undertaking cremations on returns for a Cemetery Trust. Consequently, chapel services and memorialisation are explicitly included in this analysis.
32. The analysis considers all on-going maintenance to be treated as a part of the 'Perpetual Maintenance Obligation', whether from burial or memorialisation after cremation. General grounds costs are not included unless grounds operations can be explicitly identified as specific to the crematorium or chapels, or contributing to the cremation process or the development of cremated remains memorial areas.
33. Although a significant component of Cemetery Trust operations comprise administration, there are generally no explicit measures of the costs imposed on administration from cremation (and complementary services). We have been guided by the Trusts on the allocation of administrative costs, and there appear to be two allocation methods used.
  - A number have allocated administrative costs on the basis of relative throughput (which results in a large contribution from cremations as for these cemeteries, cremations represent towards three-quarters of disposals).
  - Others have allocated very small amounts of administrative costs to cremation – these appear to represent the incremental costs from undertaking cremation activities.
34. Where identifiable, the operations associated with burial of non-cremated human remains in graves (or committal to mausolea) are not included in the analysis.
35. Costs are grouped into capital costs (start-up and refurbishment) and two groups of operating costs (cremation-related and overheads):
  - Start-up capital costs basically comprise building (including any chapel) and equipment costs.
  - Three levels of capital expenditure relate to major refurbishments associated with the furnaces –rehearing, a full rebrick and full replacement.
  - Cremation-related operating costs comprise fuel costs, wages and specific cremation-related administrative costs.
  - (Fixed) common costs or overheads incurred by the operator may be associated with or allocated to the crematoria, including allocations of administrative / managerial time, cleaning costs and the maintenance costs not covered above.
36. Revenues can be grouped as follows:
  - Operators charge a wide range of cremation fees for alternative service packages (adult versus child cremation, the timing of the cremation, whether pre-paid and method of return etc.).

- In addition, Trusts set higher fees for cremations that include a chapel service.
- Finally, memorialisation fees. While nearly all cemeteries can inter ashes, the rate of interment is substantially higher where the cemetery has a crematorium. The range and level of charges is limited effectively only by the range of memorials available.

## 6 Modelling Parameters & Comparisons with Other Jurisdictions – p. 48

37. We have developed a cash flow model to simulate the viability of the Victorian cremation industry and of each crematorium. The model has been dimensioned to the ‘economic long run’ (50 years in this case). The model enables investigation of expected viability under alternative assumptions on costs, revenues, operating parameters and entry of other crematoria. The model addresses the key questions developed in the decision framework:

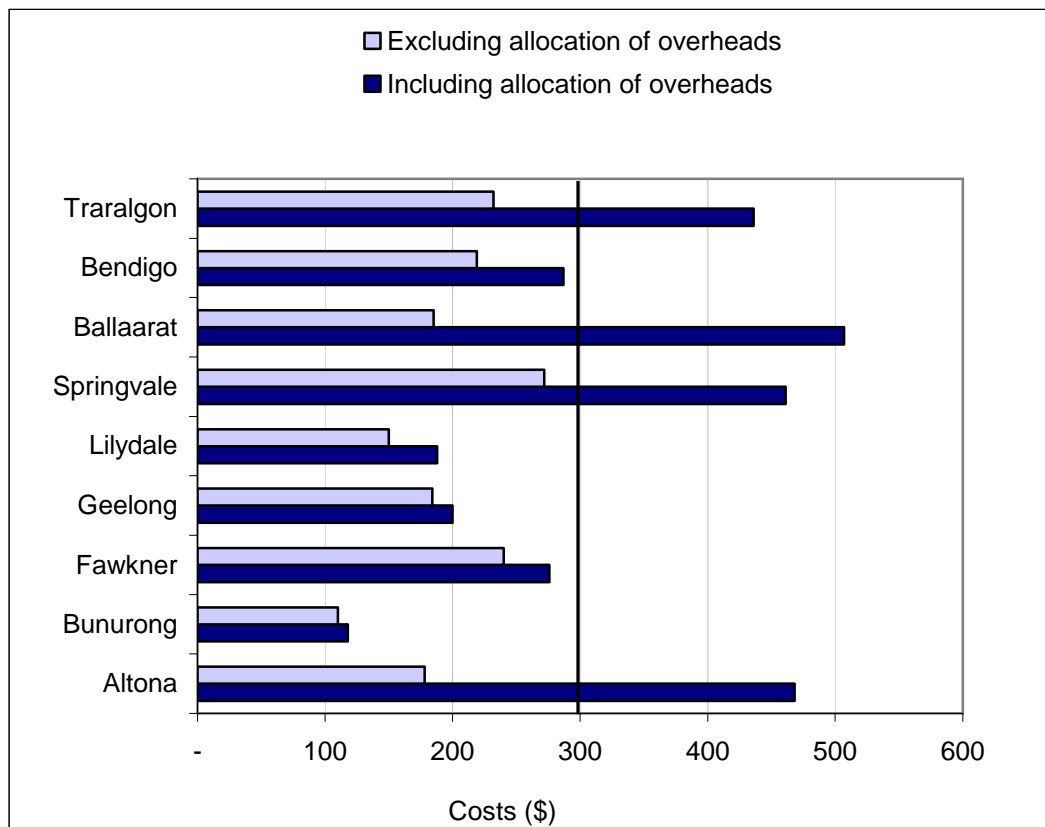
- Does the crematorium generate greater returns than would be obtained by investing its money in alternatives?
- Is the crematorium financially viable?
- The model combines all crematoria (both existing and proposed) to establish the impact of entry on the returns to the industry as well as each crematoria.

38. The major parameters for crematoria are summarised below – these provide the key inputs for economic/financial modelling. While the model is cash flow, we have included an annuity for capital items to provide an indication of the implied annual costs for these items. These annuities were estimated using the lower discount rate. There is significant variation in a number of these capital annuities (and the charge against the Written Down Replacement Cost). These primarily reflect the timing of recent upgrades.

	Altona	Bunurong	Fawkner	Geelong	Lilydale	Springvale	Ballaarat	Bendigo	Traralgon
<b>Number of cremations (2003)</b>	1,729	1,597	2,400	933	1,309	6,425	617	446	565
<b>Variable costs per cremation (\$)</b>									
Power	13	19	18	25	23	14	22	15	56
Other variable	-	4	7	-	-	34	-	3	-
<b>Fixed costs per cremation (\$)</b>									
Wages	78	65	84	70	38	33	130	90	95
Cremator annuity	62	19	99	66	88	24	20	92	33
Crematorium annuity	18	4	18	23	1	5	14	20	30
Chapel annuity	4	-	14	-	-	159	-	-	11
Other capital annuity	3	-	-	-	-	3	-	-	6
Overheads	290	8	35	16	38	190	322	67	205
<b>Average cost per cremation (\$)</b>	<b>468</b>	<b>118</b>	<b>276</b>	<b>200</b>	<b>188</b>	<b>461</b>	<b>507</b>	<b>287</b>	<b>436</b>
<b>WDRC per cremation (\$)</b>	93	78	91	115	37	104	93	145	31
<b>Average cost per cremation (\$), less allocated overheads</b>	<b>178</b>	<b>110</b>	<b>240</b>	<b>184</b>	<b>150</b>	<b>272</b>	<b>185</b>	<b>219</b>	<b>232</b>

39. Trusts have significantly different allocations of (administrative) overheads, from minimal in the case of Bunurong and Geelong to around three-quarters of specific elements for Springvale. The average costs per cremation, including and ignoring the allocation of overheads are summarised in the figure below.





40. This chart suggests that cremation charges (including some proportion with a chapel service surcharge) of the order of \$300 could be sustainable in the short term. That is, the revenues would cover the direct costs of cremation, but not make a contribution overheads, profits or repaying previous investments. This would represent a price war and unsustainable lower limit.
41. In comparison, the average adult cremation rate (no chapel service) across Victorian crematoria is approximately \$630. The revenue received by Trusts will vary reflecting time of day discounts, lower rates for children and the like. The average (cremation) revenue per cremation is \$564. (Note these are simple, not weighted, averages.)
42. Interstate and overseas private operators enjoy a number of economies of scale and scope that are not available to Victorian Cemetery Trusts. SCIA for example, enjoy many synergies through vertical integration – in addition to offering cremation, burial and memorialisation, they own a substantial network of nursing homes and well-known funeral home brands.
43. Prices for Council-run crematoria in NSW appear to average approximately \$600.
44. Prices for cremation in south east Queensland appear to be up to \$200 below that charged by Victorian operators. It is not clear, however, whether these charges are comparable with Victorian operations as there may be bundling of services and council funding of major works.

45. In the US, cremation fees appear to range from approximately A\$200 – \$560. This suggests that the lowest cost in-house cremation operations in the US set a notional cremation fee of the same order as the lowest cost Victorian operations.
46. Information from a recent review of UK crematoria suggests that costs in Victorian crematoria are broadly in line with experience in the UK and probably significantly lower in terms of operating costs. It is important to remember, however, that the UK councils charge significant amounts for rates and may operate more committal services.
- Expenditure on employees, premises, support and other running costs averaged A\$464 per cremation. Capital charges averaged A\$96 per cremation.
  - Average income of A\$764 per cremation, and therefore a surplus of A\$301 per cremation (before capital charge).
47. The overall implications of the reported costs for Hong Kong crematoria are that:
- The furnaces recently purchased to update existing equipment are at least ten times more expensive than the typical cost used for Victorian crematoria.
  - The sum of the maintenance (A\$120) and labour (A\$85) costs alone is only slightly below the adult (heavily subsidised) cremation charge in urban areas (A\$235). Power costs are likely to take the total operating costs closer if not past this charge.
48. In general, obtaining useful operational and financial information regarding Victorian crematoria for the purposes of economic analysis appears to be more difficult than warranted, even with the cooperation of the Department and most Cemetery Trusts. Reasons for this appear to include limitations of current reporting requirements and historical management arrangements, in addition to very low levels of cooperation between Trusts.

***Recommendation 2 – That the Government work with the Cemetery Trusts to improve the range and quality of documentary information collected and made available, including statutory reporting requirements and other less formal reporting. Reporting should include not only probity and public finance requirements but assist in broader analysis and policy development, including business and industry planning. Consideration should also be given to ensuring the scope of required reporting is commensurate with the scale of Trust operations. (Page 80)***

49. From discussions with Trust representatives, there appears to be confusion (or at the very least, no common understanding) as to exactly how and why Trusts are competing on provision of cremation (and other) services and even whether this is valuable.

***Recommendation 3 – That the Department support and promote communications within the cemetery sector and with regard to Victorian Cemetery Trusts providing cremation services, in particular. The aim of this is to improve service provision by increasing the synergistic without compromising competitive aspects provided by the current Trust arrangement. (Page 82)***

## 7 Fundamental Financial Viability of Victorian Crematoria – p. 83

50. Based on the information provided by Victorian Cemetery Trusts, we developed a model of an indicative crematorium. This allowed analysis of the basic cost drivers and revenues and provides the basis for analysis of potential entrants (where details of costs and revenues is not known).
51. Based upon scenario analysis of growth rates, we consider that the likely variations from the average annual growth rate will have minimal effect on returns to the industry. (We therefore only use 1% pa growth as the indicative rate in further scenarios.)
52. We conducted analysis to determine the implied throughput level in 2003 to breakeven, using the ASX 100 Accumulation Index as the hurdle rate (this provides a slightly higher estimate of the breakeven level). In the following table, the first column lists the breakeven cremation rate in 2004 based on the hurdle rate and a price of \$600 per cremation. The table also shows the rate of return at cremation rates of 3 and 6 per day. The rows show different configurations.

Scenario	Breakeven throughput at ASX 100 Accumulation Index rate	IRR	
		(cremations per day)	3 cremations per day
<b>Single rural cremator</b>			
1R	1.6	44%	127%
1BR	1.7	38%	107%
1BRC	1.7	31%	86%
1BRCM	1.6	35%	94%
1BRC <sub>L</sub> M	1.8	27%	71%
<b>Two rural cremators</b>			
2BRC	1.8	26%	69%
2BRC <sub>L</sub> M	1.9	23%	60%
<b>Three metro cremators</b>			
3BC	2.0	20%	55%
3BC <sub>L</sub> M	1.9	21%	54%

53. The configurations show the effect of using typical Regional versus metropolitan parameters, including Buildings, including a Chapel, including Memorialisation and including a (large) Chapel<sub>L</sub>.
54. As shown, against the ASX 100 Accumulation Index rate, the breakeven level of throughput is low for all configurations examined. The estimated breakeven levels of throughput are tightly banded ranging from 1.6 to 2 cremations per day (or 420 to 480 per annum). For all configurations considered, breakeven is achieved at throughputs less than 50% of standard operating capacity. However, if the price for cremation were to be reduced to, say, \$400, then the breakeven levels of throughput would rise significantly.

55. Throughput has a far more significant effect on returns than the different configurations or scenarios tested. Across the various scenarios, at any particular throughput level, little relative difference was seen in unit cost. The effect of cannibalisation of market share (e.g. the difference between throughput of six and three cremations per day) is to almost double unit costs.
56. Analysis demonstrates the stark effect that new entry has on cash balances of crematoria operators. For example, a scenario with a sole crematorium running a single unit would generate almost \$90m by 2051 (with throughput averaging 6 per day). In contrast, two crematoria each running one unit would generate \$35m. In effect, around \$20m has been lost to the industry due to lower average throughput in each crematorium. This is a *minimum* impact of entry because no price competition is assumed.
57. We undertook additional modelling to facilitate an industry level perspective, examining the impact of price competition and cannibalisation of market share. The existing industry units were categorised as serving two basic areas, regional and Melbourne metropolitan.
58. The situation of the pre-existing Victorian industry was used as the modelling base case, approximated by combining the representative models previously developed. The table shows the returns across the industry.

	Individual			Total		
	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)
<b>Regional</b>	16	2.5	42	16	10	166
<b>Metropolitan</b>	44	11	190	44	91	1,523
<b>TOTAL</b>					101	1,688

59. From the base case, we have simulated price competition by examining the impact of a small price fall (reducing prices by \$100) and a large price fall (reducing prices by \$200) for both regional and metropolitan crematoria.
- For regional crematoria, price falls of around \$200 will result in below market returns and the loss of the modelled \$10m NPV and \$45m in accumulated balances for each crematorium. Across all regional crematoria, over \$5m of value would be lost with a small price fall and \$11m from a large price fall.
  - The impact of price falls on the metropolitan crematoria is significant, albeit not a threat to solvency in the short-term as it would be in the case of regional ones. The small price fall will cut around \$2.5m from each cremator unit's NPV and \$45m from final cash balances. Across all metropolitan crematoria, there is a reduction in the NPV of around \$21m and in cash balances of over \$350m. Broadly, both the NPV and accumulated cash balances fall by one-quarter under the small price fall and are almost halved under the large price fall.

60. Whilst entry is possible in both the metropolitan and regional markets, the impacts of each are likely to be different. The returns for regional crematoria are significantly lower than for metropolitan ones. There is insufficient throughput to justify a new entrant to the industry ‘attacking’ an existing regional market. Establishment of new regional crematoria would typically be expected to occur in geographically distinct markets. Any likely entry would be positioned to expand the Victorian market (albeit potentially cannibalising interstate industries). Consequently, a new regional crematorium would be unlikely to cause cannibalisation of an existing crematorium and any detrimental industry effects are likely to be minimal.
61. The effects of cannibalisation on metropolitan crematoria were as follows:
- Shared cannibalisation results in a relatively small reduction in the profitability of both individual crematoria and for the industry as a whole. Across the industry, the NPV falls by slightly over \$6m.
  - In contrast, whilst concentrating the losses on one incumbent results in much the same decline in total metropolitan returns and balances, returns of the affected incumbent and the entrant are only marginally above market returns. Under concentrated competition, industry NPV falls by slightly over \$6m, but the NPV for the closest existing crematorium falls by \$9m.
62. The impacts of price reductions and cannibalisation is summarised in the table below.
- The dominant effect for the industry is the threat of price competition. In a market (particularly in Melbourne) where 54% of deaths result in cremation, there is limited opportunity to establish new crematoria based on new markets. Consequently, any entry is likely to cannibalise existing crematoria share. If entry results in a sharing of the “burden” then it will not be in the interest of existing crematoria to engage in a price war. Indeed the potential losses from a price war may threaten more marginal incumbents.
  - However, if much of the burden of cannibalisation falls on one existing crematorium, the reduction in returns for that crematorium is significant. The capacity to actually engage in a price war is however, now significantly reduced. Much of the pre-existing surplus would be lost by higher unit costs resulting from the fall in throughput. This is the case for regional Victoria.

	Change:	
	NPV (\$m)	Accumulated Cash Balance (\$m)
<b>Original 21 cremators</b>		
<b>Price effects</b>		
Base case		
Small price fall	-49	-819
Large price fall	-98	-1,638
<b>Two additional cremator units in metropolitan area (no effect on rural volumes)</b>		
<b>Shared cannibalisation</b>		
Base case	-13	-210
Small price fall	-62	-1,029
Large price fall	-111	-1,848
<b>Concentrated cannibalisation</b>		
Base case	-12	-204
Small price fall	-61	-1,024
Large price fall	-110	-1,843

## 8 Financial Viability Results – p. 111

63. Metropolitan crematoria are modelled to achieve an average rate of return of 39% in the period to 2051. Importantly, this approximate level of return is achieved within ten years. All non-metropolitan crematoria operate at lower scales than the metropolitan crematoria. However, on average they still generate almost 30% in the long run, achieving 25% in the medium term.

IRR (%)	Short term (5 years)	Medium term (10 years)	Long term (20 years)	Economic long term (to 2051)
<b>Metro average</b>	25%	37%	39%	39%
<b>Regional average</b>	11%	25%	29%	29%
<b>VICTORIAN AVERAGE</b>	<b>24%</b>	<b>35%</b>	<b>38%</b>	<b>38%</b>

64. The metropolitan crematoria in aggregate are modelled to generate cash reserves of over \$200m in real terms within 20 years. Reflecting the smaller scale of the non-metropolitan crematoria, real cash reserves are expected to increase by around only \$3m to \$15m in the medium to long term.

Real accumulated cash balance 2003 dollars (\$m)	Short term (5 years)	Medium term (10 years)	Long term (20 years)	Economic long term (to 2051)
<b>Metro total</b>	14.5	64.6	232.4	2,235
<b>Regional total</b>	0.2	3.5	15.1	162
<b>VICTORIAN TOTAL</b>	<b>14.7</b>	<b>68.1</b>	<b>247.5</b>	<b>2,397</b>

## 9 Cremation Market Analysis & Review of Potential Sites – p. 118

65. From our analysis of demand for cremations in Victoria, current crematoria capacity, and the patterns of use of these facilities it is evident that the vast majority of people in the State is well-served by the current network of crematoria. However, it is possible that the introduction of additional facilities will increase the demand for cremations (i.e. result in a supply-induced increase in demand). Our analysis shows that irrespective of the assumptions about future demand for cremations, the current industry has the capacity to service demand until close to 2051.
66. Our analysis of cremation demand has shown that it is generally highest in areas served by existing facilities. These areas comprise the Melbourne metropolitan area and urban centres with a crematorium. The corollary to this is that demand in these locations is unlikely to increase further based on the addition of new facilities.
67. Whilst some SLAs in metropolitan areas recorded below average rates of cremation in 2002, it is evident that this is not due to the distance between the SLA and a crematorium. Further, there is no evidence to suggest any part of the metropolitan area is exhibiting unmet need.
68. Given that existing capacity in Metropolitan crematoria is sufficient to meet forecast demand until at least 2040-2050, it is considered that new facilities will not be warranted within the Melbourne metropolitan area within the forecast period. Moreover, were additional facilities established in this part of the State, it is expected that they would merely redirect market share away from existing crematoria. Whilst greater utility may be offered to the market by a more diverse industry, the negative impacts of even lower utilisation rates are expected to be significant and potentially deleterious for the industry at large.
69. In contrast, the siting of new facilities in some non-metropolitan regions would have significant potential to increase cremation rates in those regions. However, any new facilities must meet the first evaluation criteria of being viable in its own right.
70. The minimum throughput required for regional crematorium viability is between 420 and 480 cremations per cremation unit per year. To achieve viability, it will be necessary for a proposed crematorium to derive between 210 and 240 cremations from the existing population within a distance of 75km.
71. Shepparton, Wangaratta and Horsham were identified as potential candidate locations worthy of further investigation within the State. For each location, the number of cremations within 75km was estimated using the cremation forecasts developed, and the share of these cremations that the new facility would enjoy was calculated.
72. **Horsham:** It is evident that a new crematorium at Horsham is unlikely to achieve the minimum throughputs required within the forecast period. Even with 100% market share, it is expected that there would be insufficient cremations at the facility until sometime after 2036.

73. **Wangaratta:** It is evident that a new crematorium at Wangaratta is likely to achieve the minimum throughputs required only after 2041 (depending on which projection series is assumed). To prove viable in the short term, this facility would need to achieve a market share in excess of 75%. However, this is considered unlikely given existing patterns of market share.
74. **Shepparton:** It is evident that a new crematorium at Shepparton is likely to achieve the minimum throughputs required somewhere between 2021 and 2031 (depending on which projection series is assumed). However, to achieve viable levels in the short term this facility would need to attract better than 50% market share.
75. Research conducted for this project has not revealed any evidence in support of the need for additional crematoria in Victoria. The current mix of crematoria in Victoria adequately services the needs of the market. The industry has sufficient capacity to continue to service these needs for at least the next 40-50 years. (The addition of another facility has been examined and it was found that such a facility would be unlikely to increase demand sufficiently to achieve minimum throughput levels. This is not unexpected given the under-utilisation evident within the industry.)
76. The analysis has erred more on the generous side in evaluating potential sites:
- average revenues assumed are above industry average;
  - potential core demand area (75km) is around double the radius of existing areas.

***Recommendation 4 – That the Department and Cemetery Trusts focus on maintaining and improving pre-existing crematoria for the next 20-30 years, rather than considering establishing new facilities. (Page 127).***

77. The Department may in future wish to consider crematorium proposals that do not meet the economic/financial conditions outlined in this report. New facilities may be considered due to particular regional socioeconomic issues (such as access to services) or to address funding shortfalls for particular Trusts.

## 10 Viability of Current Proposals – p. 128

78. **Wangaratta:** Based on the assumptions in the proposal, the Wangaratta crematorium would meet its hurdle rate of return.
- While a facility at Wangaratta is viable based on the proponent's estimates, we consider that these are not representative of the likely demand, costs and revenues that the facility will face. Informed by our analysis of the operations of existing crematoria and using indicative cost estimates from the representative model, a facility at Wangaratta is likely to be marginally viable at best. However, as it is also likely to reduce demand and returns to Bendigo, the economic/financial criteria indicate that the facility should not go ahead.



79. **Preston:** Unfortunately, detailed data were not provided for the Preston proposal. However, based on insights from the representative model and the analysis of unmet demand in Victoria, the facility will not generate sufficient new demand to prevent overall losses to the industry. While Preston may generate \$0.5m by 2022, losses to neighbouring facilities would be in the order of \$4.0m.

## 11 Other Considerations – p. 131

80. Very few Cemetery Trusts currently operate crematoria which generates significant income for these Trusts. However, all Trusts face increasing costs associated with their PMO and a limited funding source in burial revenue.
81. Given that we do not foresee sufficient demand in Victoria to support the construction of new crematorium facilities, the question of cremation income disparity between the Cemetery Trusts remains.
82. Further compared with the major sources of operational revenue, cremation income is not affected by capacity constraints. This is in stark contrast to burials, for which income is limited by land availability, yet maintenance costs are potentially unlimited.
83. This report cannot make any conclusion on the ability of the existing and future revenues from cremation to fund the PMOs of all of the Trusts, nor even for those Trusts that operate them. It cannot therefore recommend whether revenue should be redistributed from Trusts with existing cremation facilities.
84. It is the case that those Trusts without crematoria will continue to desire the ability to undertake cremation services to supplement their revenues.
85. This report has investigated and made recommendations effectively on the most efficient way that the Department can raise revenue through cremation services. It is not effective at addressing distribution of returns. A continuation of the current approach will see the “haves” continue to earn significant revenues and possibly fund their PMO and the “have nots” face dwindling income earning capacity with increasing costs.
86. This study therefore provides a platform for the Department and the industry to reflect on policy options regarding income sources and maintenance obligations more generally.
87. The recommendation of this report is that no new crematoria be built in the medium to long term. This necessitates a review of the distribution (if possible) of existing revenues to meet the industry’s PMO.
88. The options can be broadly categorised as follows:
1. Changes to the structural arrangements of provision of cremation services to distribute the profits of cremation directly, or
  2. Other mechanisms to access and (re-)distribute the profits of cremation, e.g., via licensing fees, industry levy etc.

***Recommendation 5 – That the Department examine policy issues and options for Cemetery Trusts regarding income sources, their distribution and maintenance obligations more generally. (Page 136)***

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# Supporting materials

## Appendices

The appendices to this report are provided under separate cover:

- Appendix A – Maps (A3 format).

## Economic/Financial Model for Victorian Crematoria

This comprises three components:

- An Excel workbook, used as discussed in this report.
- A brief User Guide, relevant to the model's intended use and audience.

## Report by CST

MJA engaged Cumpston Sarjeant Truslove, consulting actuaries, as subconsultants to assist in undertaking this review. CST's detailed report to MJA is provided separately.

- *Death projections 2001-2051 for Victorian statistical local areas*, June 2004.

## Reports by Spatial Vision

MJA engaged Spatial Vision as subconsultants to assist in undertaking this review. Spatial Vision are experts in geographic information systems. Spatial Vision's detailed reports to MJA are provided separately.

- *Review of Crematorium Industry in Victoria – GIS Processing Methodology*, June 2004.
- *Victorian Crematorium Industry Review*, August 2004.



# Sources of information

## Subconsultant's reports

The reports by CST and Spatial Vision listed in 'Supporting Materials' are key information sources underpinning this report.

## Interviews

Cost and revenue data and operational statistics were collected via interviews with Cemetery Trust executives and trustees.

- Altona Crematorium
- Bunurong Crematorium
- Fawkner Crematorium
- Geelong Crematorium
- Lilydale Crematorium
- Springvale Crematorium
- Ballarat Crematorium
- Bendigo Crematorium
- Traralgon Crematorium
- Preston Cemetery Trust
- Wangaratta Cemetery Trust.

## On-site tours

On-site tours were undertaken and provided further background to our understanding of Victorian cemetery and crematoria operations.

- Bunurong Crematorium
- Lilydale Crematorium
- Springvale Crematorium
- Ballarat Crematorium
- Bendigo Crematorium
- Traralgon Crematorium.

### Documentary sources

- Cemetery Trust Annual Reports.
- DHS – NCP reports from 1996 & 2001.
- Wangaratta City Council Business Case.

### Other data sources

- Victorian Registry of Births, Deaths and Marriages (BDM): extract of Deaths Registered in Victoria, 2002
- ABS: Victorian Deaths for 2002 by SLA
- ABS: Population Counts for 1991, 1996 and 2001 by SLA

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- Cemetery Trust executives and Trustees (refer 'Interviews' and 'On-site tours' in above section).
- Victorian Department of Human Services.
- QCCA.
- InvoCare.
- FEHD (Hong Kong).
- Brisbane City Council.
- ACCA / CCAV.

# Terminology

This section aims to provide an introduction to terminology relevant to this report (rather than being a traditional ‘glossary’). It includes:

- terminology particular to the burial and cremation industry in Victoria; and
- some economic/financial terminology, as it has been used in the context of this report.

## Industry terminology

### cremator unit

A cremator unit is a furnace used, in conjunction with an ash processor, to reduce a deceased person to ashes.

### crematorium

Crematorium refers to a facility or site with one or more cremator units.

### disposal

Disposal of the deceased may occur via traditional burial or cremation.

Cremated remains may remain at a cemetery or be taken away by family and friends of the deceased.

- remain at cemetery –
  - with memorialisation: there are various service levels of memorialisation, for example wall niche, rose garden or other various types of commemorative locations, books of remembrance etc.
  - scattering in cemetery gardens,
- taken away by family & friends – e.g. retention at home (in a holding vessel or urn), scattering at a meaningful place etc.

### memorialisation

The commemoration of the deceased.

Although it potentially has a wider meaning to include traditional burial, we have generally used memorialisation in reference to the products and services supplied by Cemetery Trusts for commemoration of *cremated remains* – e.g. supply, installation and perpetual maintenance of a bronze memorial plaque, holding container and plot.

### PMO (perpetual maintenance obligation)

We use the acronym PMO to refer to the large liability Victorian Cemetery Trusts carry with regard to maintaining their cemeteries. Victorian cemeteries contain many plots which the Trusts are obligated to maintain in perpetuity.

### throughput

The volume of cremations that a cremator unit or crematorium facility undertakes in a period of time. For the purposes of our analysis, we often discuss throughput in average daily terms.

#### capacity

The *maximum* throughput that a given cremator unit or crematorium facility can sustain. The capacity can be defined in a variety of ways including under generally accepted operating conditions in Victoria.

#### utilisation

Utilisation is throughput for a crematorium or cremator unit as a proportion of its capacity.

#### cremation rate

The proportion of number of cremations to the sum of cremations plus burials. In terms of this analysis, it is the proportion of Victorians cremated to the number of Victorians cremated or buried according to classifications by Births, Deaths and Marriages.

### Financial analysis terminology

#### overhead costs

Overhead costs are costs incurred by Cemetery Trusts that do not relate directly to any particular activity. A major overhead cost for most Trusts is their administration.

It is important to note that Victorian Cemetery Trusts do not separately quantify cremation costs, revenues and assets from other services in their financial reports.

The allocation of fixed costs is as a result a subjective process. Costs may be allocated on relative throughput of different activities (burials, cremations, memorialisations, interment in mausolea), relative revenue or proxy measures of activity.

#### unit cost

The average cost to the crematorium operator of undertaking a single cremation. Unit cost is therefore a function of all costs and throughput.

#### representative crematorium

The representative crematorium has been used as a starting point for financial modelling and is based on defensible costs and revenues observed across the Victorian sector.

#### financial indicators or diagnostics

Financial analysis provides a range of tools to examine the viability of an entity.

We have generally used IRR as it is not scale dependent and therefore allows comparison across different crematoria. We also highlight the cash balances of the entity during and at the end of the period examined, and the net present value of the business' cash flows.

#### IRR (Internal Rate of Return)

The IRR is the average annual rate of return that is implied by the business' payments and receipts. This rate of return is compared with the business' hurdle rate.

#### hurdle rate

The hurdle rate is the return a Trust could receive on alternative financial investments were it not to invest in a crematorium. It therefore represents the minimum return necessary to justify such an investment. The hurdle rate incorporates the relative risk associated with the investment.

#### scenario analysis

Scenario analysis is used to test the sensitivity of crematoria as an investment (via the financial indicators) to variations in parameters (e.g. rise in costs due to added services, drop in throughput due to competition). Typically individual parameters are varied, but combinations may be varied at once if they are interrelated.

### Market terminology (as used in the context of this report)

#### economies of scale, economies of utilisation

Economies of scale refers to the efficiency gains that may be realised by using larger equipment or scale of operations to meeting greater demand over duplication of facilities.

Economies of utilisation refers to the lower unit costs that may be realised through higher capacity utilisation. As many costs are fixed, average costs fall significantly as throughput rises.

#### factory approach, full service approach

The provision of cremation services varies widely between jurisdictions in terms of the location and operation of crematoria facilities.

It is useful to consider the approach to provision of cremation services as potentially being anywhere on a spectrum from a factory (for want of a better term) to full service approach.

The factory approach broadly looks at cremation as solely the operations associated with the furnace. A factory approach is characterised by a focus on efficiency, with minimal service provision, fewer and more centralised crematoria facilities, but each site having greater capacity (more cremator units).

The full service approach is characterised by a customer focus, with more value-added services ('vertical integration'), more crematoria sites with greater geographical dispersion (closer to consumers) and less capacity at each site (fewer cremator units).

#### untapped market, latent demand

A situation where there is unmet demand for cremation in a particular area, e.g. due to lack of local supply or perhaps insufficient marketing.

#### established or mature markets

An area where little unmet demand for cremation would be apparent if a new crematorium was established or greater marketing undertaken.

In an established market, new entry does not allow the market to expand, merely to be split into more pieces (see cannibalisation).

#### cannibalisation

Used in this report to describe the splitting of an existing market caused by an entrant.

#### shared reduction, concentrated reduction

Under situations where a market is cannibalised, the distribution of any impact on existing crematoria may vary. We have set the boundaries of this impact by a shared reduction and a concentrated reduction.

We use the term shared reduction to refer to the situation where the demand impact (cannibalisation) caused by a new crematorium entrant is shared equally across all existing facilities.

Conversely, concentrated reduction refers to the situation where a new crematorium entrant would significantly cannibalise demand on one other existing facility.

# 1. Objectives, Approach & Background

Marsden Jacob Associates (economic and financial consultants), with the support of Spatial Vision (spatial analysts) and Cumpston Sarjeant Truslove (consulting actuaries), were engaged by the Victorian Department of Human Services to conduct a Review of the “Victorian Crematorium Industry”.

## 1.1. Objectives

The review had two broad aims:

1. Investigate the economic returns from Victorian crematoria and report on the current financial state of the Victorian ‘cremation industry’.
2. Provide a clear basis for the Department to evaluate proposals from Cemetery Trusts to establish new crematorium facilities.

## 1.2. Approach & Outline

Our approach has involved the following tasks:

<i>Develop a methodology for evaluating the financial viability of the ‘cremation industry’ and proposed new facilities.</i>	Chapter 2 – Methodology
<i>Analyse the nature and future extent of demand for cremation services in Victoria.</i>	Chapter 3 – Analysis of Demand for Cremation Services in Victoria
<i>Analyse the current operational capacity of the industry and supply of cremation services.</i>	Chapter 4 – Analysis of Supply of Cremation Services in Victoria
<i>Develop an economic/financial model for a representative Victorian crematorium including a detailed survey of crematoria costs, revenues and other operating parameters.</i>	Chapter 5 Elements of Crematorium Viability
<i>Survey and describe inputs to the model, and compare with information from other jurisdictions.</i>	Chapter 6 Modelling Parameters & Comparisons with Other Jurisdictions
<i>Review financial/economic viability for a generic or representative Victorian Crematorium.</i>	Chapter 7 – Fundamental Financial Viability of Victorian Crematoria
<i>Review expected returns to individual Trusts with crematoria and as an industry group.</i>	Chapter 8 – Financial Viability Results

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<i>Undertake a market analysis to review potential sites for new crematoria (via simulations of a range of future market scenarios).</i>	Chapter 9 – Cremation Market Analysis & Review of Potential Sites
<i>Review known Cemetery Trust proposals for crematoria in light of findings.</i>	Chapter 10 – Viability of Current Proposals
<i>Assess implications of above findings.</i>	Chapter 11 – Other Considerations
<i>Details major assumptions and limitations of this review</i>	Chapter 12 – Assumptions & Limitations

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## 1.3. Background

### 1.3.1. Victorian Cemetery Trusts

There are 561 public cemeteries administered by 526 Cemetery Trusts in Victoria with approximately 93% of Trusts operating in rural Victoria.. These cemeteries are operated under public ownership with local governments managing 14%.

Victorian Trusts are responsible for the day-to-day operations of the cemeteries and developing revenue sources to ensure that these cemeteries can be maintained in perpetuity. In the cases of most Trusts, there are few opportunities to develop revenue sources outside of traditional burial fees.

However, a number of Trusts have been able to supplement their revenue by providing more services through services in chapels at the cemetery, developing refreshment and florist retail facilities, expanding options for commitment including mausoleums and memorialisation options and providing cremation services.

### 1.3.2. The Victorian ‘Cremation Industry’

The brief refers to the ‘crematoria industry’, however on consideration we have preferred to use the term ‘cremation industry’.

There is no clear definition of the ‘cremation industry’ or ‘crematoria industry’, in terms of operations, revenue streams and costs, for two main reasons:

- Cremation services are provided as one of a number of products and services supplied by Victorian Cemetery Trusts. Separation for accounting purposes appears to be rare and inconsistent.
- There is a strong argument that the ‘cremation industry’ or ‘crematoria industry’ is wider than just being strictly the provision of *cremation*. For example, many in the industry would consider the closely related services of memorialisation (of cremated remains) and provision of chapel services to be included in any economic analysis of the ‘cremation industry’.



As there is no agreed definition for the ‘cremation industry’ we have been guided by industry sources (refer Section 5.1 – Approach to Assessing Victorian Crematorium Viability).

All Victorian crematoria are co-located with cemeteries, reflecting historical operational management (this differs from other states, where, for example, a single cremator unit may be associated with a private funeral director business).

The nine Trusts with crematoria are also responsible for operating 6% of Victoria’s cemetery sites (by number).

Also of note, none of the Victorian Cemetery Trusts with crematoria are Trusts which are associated with local government (city councils).

**Table 1 - Victorian Cemetery Trusts with crematoria and associated cemetery sites**

Trust	Name of Cemetery Site *	Suburb / Town
Ballarat General Cemeteries Trust	Ballarat Old Cemetery	Ballarat
	<b>Ballarat New Cemetery</b>	Ballarat
Bendigo Cemeteries Trust	Axedale	Axedale
	Bendigo	Bendigo
	Eaglehawk	Eaglehawk
	Kangaroo Flat	Kangaroo Flat
	<b>Neangar Memorial Park Cemetery</b>	Eaglehawk
	White Hills	White Hills
Cheltenham Regional Cemeteries Trust	<b>Bunurong Memorial Park</b>	Bangholme
	Cheltenham Memorial Park	Cheltenham
	Cheltenham Pioneer Cemetery	Cheltenham
Fawkner Cemetery Trust	Coburg "Pine Ridge" Cemetery	Coburg
	<b>Fawkner Crematorium &amp; Memorial Park</b>	Hadfield
	Northern Memorial Park	Glenroy
Geelong Cemeteries Trust	Barrabool Hills (Highton) Cemetery	Highton
	Drysdale (Bellarine) Cemetery	Drysdale
	Flinders Memorial Park	Lara
	<b>Geelong Memorial Park &amp; Crematorium</b>	Mount Duneed
	Geelong Western Public Cemetery	Geelong West
	Grovedale (Germantown) Cemetery	Grovedale
	Leopold (Kensington) Cemetery	Leopold
	Mount Duneed Cemetery	Mount Duneed
	Portarlington Cemetery	Portarlington
The Eastern Cemetery	East Geelong	
Lilydale Cemetery Trust	Healesville Cemetery	Healesville
	Lilydale Lawn Cemetery	Lilydale
	<b>Lilydale Memorial Park &amp; Cemetery</b>	Lilydale
	Yarra Glen Cemetery	Yarra Glen
The Altona Memorial Park Trust	<b>The Altona Memorial Park</b>	Altona North
	Williamstown Public Cemetery	Williamstown
The Necropolis Springvale Trust	Melbourne General Cemetery	Carlton North
	St Kilda General Cemetery	St Kilda East
	<b>The Necropolis Springvale</b>	Clayton
Traralgon Public Cemetery Trust	<b>Gippsland Memorial Park</b>	Traralgon

\* Bolded sites indicate co-location of crematoria facilities.

## 2. Methodology

### 2.1. Outline

The purpose of this chapter is to outline the methodology developed and used to deliver the objectives and outputs as specified in Section 1.1.

- The financial indicators (diagnostics) used to evaluate financial viability of crematoria are discussed in Section 2.2
- Section 2.3 provides an overview of the financial viability assessment methodology.
- The components of the assessment methodology (proposal evaluation and industry evaluation) are covered in Section 2.4
- The methodology of the market analysis is covered in Section 2.5.
- Section 2.6 provides an introduction to the possible approaches to supply and location of cremation services which have been considered.

The methodology is based on an economic/financial analysis of both individual crematoria and of the ‘cremation industry’<sup>1</sup>.

A key element in examining the viability of the crematoria industry and of potential new investment is the determination of the likely market for these services.

### 2.2. Financial Indicators (Diagnostics)

Modern financial analysis provides a number of diagnostic tools to examine the performance of an entity or a project. Each tool gives a different emphasis and the use of any one or combination of these will reflect the question being asked.

Our analysis is based on the free cash flows.<sup>2</sup> The analysis of the existing industry and evaluation procedures utilise several key diagnostics which are described in more detail below:

- **cash balances** (‘cash flows’) over time and the **net cash balance**<sup>3</sup>; and
- the **IRR** (Internal Rate of Return).

Analysis of free cash flows also enables assessment of the net present value (NPV) of an investment measured using the opportunity cost of capital.

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1 As such, it does not include other policy aspects that may necessarily need to be explicitly examined in an evaluation, for example including overall economic benefit to the State, considerations of providing ready access to cremation services, and regional and local goals.

2 Free cash flows exclude interest revenues and costs.

3 This represents, for example, funds available to a Cemetery Trust to maintain cemeteries.

These indicators are examined for the short term (five years), medium term (10 years), long term (20 years) and longer periods (to 2051).

These measures are all generated from the annual cash balances and are therefore related. They are likely to lead generally to similar conclusions on ranking of projects in terms of investment decision-making, but they retain different uses and the implications can differ subtly.

### Accumulated cash surpluses

The accumulated cash balances earned by the crematorium over the life of the analysis provide information towards two aspects to the performance of an entity.

First, examination of the individual balances will identify periods when the operation of the crematorium requires funding from the parent entity. This may be a single year of major capital works or longer periods of negative cash balance. In the latter case, concerns about the viability of a private entity would be raised. This is referred to the entity's '**bankability**'. A project may be profitable over its life, but unbankable at points along the way.

Second, the accumulated cash balance provides an estimate of the contribution of the crematorium toward the Trust's cash reserves. These are therefore available to fund the maintenance associated with its cemeteries, particularly the obligation to fund the maintenance of established cemeteries in perpetuity.

The accumulating surpluses are compounded at an interest rate equivalent to the opportunity cost of capital. Given the conservative investment behaviour of most Cemetery Trusts, we have used the long-term bond rate to represent this cost.

### NPV

**Net present value** (NPV) is the value in today's dollars of the stream of revenues received and costs incurred associated with the crematorium. The stream of costs and revenues is discounted using the opportunity cost of capital. The NPV however is affected by the scale of the investment. A large investment will return a larger NPV than a smaller investment given the same IRR.

### IRR (Internal rate of return)

The IRR is defined as that rate of discount that will cause the present value of net cash inflows to equal the present value of the outflows. Equivalently, IRR is that rate of discount that will cause the net present value of the object to be zero<sup>4</sup>.

The estimated IRR can be compared with the rates of return of alternative investments and the opportunity cost of capital. Unlike NPV and cash balances, the IRR is not affected by scale and allows comparisons across different crematoria.<sup>5</sup>

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4 Bishop et al, (1988) *Corporate Finance*, 2nd Ed, .

5 See, however, footnote 69 for limitations of IRR.

## Opportunity cost of capital

Investment in crematoria is typically funded from reserves accumulated by the Cemetery Trusts and on occasion from borrowings. Regardless of funding source, all projects need to be evaluated against the (opportunity) cost of those funds – this opportunity cost is the hurdle rate of return that would have been achieved from the funds.

Financial analysis uses this cost of capital to include the relative riskiness of a project or entity when compared with risks associated with the entire market. More risky projects and entities will expect to earn more than less risky. Consequently, they will have a higher “hurdle rate” to justify the investment.

We must consider the level of risk of investing in a crematorium in Victoria. As an indicator of this risk, we can examine the private sector crematoria operators in say New South Wales or South Australia. However, the relevance of these to the Victorian regime can be debated as they face significantly different regulated markets and institutional arrangements.

The key risks facing investment in crematoria are:

- regulatory risk associated with government policy on competition in crematoria;
- regulatory risk associated with changing (higher) environmental standards (and their associated costs);
- construction risk associated with potential blow-out in establishment costs; and
- demand risk associated with consumer preferences for cremation.

What is clear is that the risk of investments in crematoria in Victoria is strongly influenced by government policy. Cremation demand has been very stable over time and there is little evidence in Australia or overseas that consumer preferences can change dramatically away from cremation. It is also clear that, except for changes in government policy, the overall riskiness of crematoria investment would be low. For example, it is likely to be as risky as regulated public utilities such as water. These latter utilities may be half as risky as the overall market.

The opportunity cost of capital for crematoria projects should lie between the riskless rate of return and the market rate of return. These are approximated, respectively, by:

- i. *the risk free rate* (as measured by the rate on long dated Commonwealth bonds). Recently, this rate has been around 6%; and
- ii. *the market return for an average investment*. This can be measured by the ASX Accumulation Index over the past decade. This return is around 10%.

Our approach is, therefore, to use these rates as bounds for the likely opportunity cost of capital, knowing that the “correct” figure lies somewhere between. Indeed, the current Treasury rate lies between these bounds.

## Breakeven price and throughput

The breakeven price is the unit revenue input into the model that generates an IRR equal to the cost of capital. Because there are two costs of capital setting upper and lower bounds to these estimates, two breakeven prices will be generated. Alternatively, the breakeven throughput (again two estimates) is the throughput that generates an IRR equal to the cost of capital. In each of the price and throughput breakeven levels, all other inputs are unchanged.

### 2.3. Overview of assessment methodology components

It is a fundamental element of cost-benefit analysis that the benefit of any proposal must be considered relative to the benefit of maintaining the status quo, or *base case* (refer Section 0). The evaluation framework

We therefore examine the expected returns and viability of the existing crematoria industry and the expected returns and viability for the proponent under the two alternatives of with investment in crematoria and without investment (base case).

For the proponent, the base case is that there is no investment in new crematoria facilities. It is assumed that the cemetery trust will earn its opportunity cost of capital on the funds that it would have used for the investment.

For the industry as a whole, the current expected returns represent the base case.

The ‘decision framework’ comprises two components, representing separate ‘hurdles’ for any proposal.

**Component One – Proposal evaluation**      *An evaluation procedure based on the **financial viability of the proposal with regard to the proponent** (i.e. in isolation to other existing service providers).*

*(Refer Section 2.4.1)*

*Typically, a project is unlikely to be put forward by a Cemetery Trust unless it meets its proponent’s hurdle rate (refer Section 2.2). However the hurdle rate may not be the sole criterion examined by proponents. Despite this caveat, this analysis focusses on achieving hurdle rates as the standard in project evaluation methodology.*

*The proposal must also be bankable.*

**Component Two – Industry evaluation**      *An evaluation procedure that aims to **maximise returns to the Victorian cemetery industry** (Victorian Cemetery Trusts).*

*(Refer Section 2.4.2)*

*The second evaluation procedure considers whether the cemetery sector overall will benefit from the proposal. This is important, as these are public services and institutions and the Department has responsibility for the cemetery sector under the Act.*

In addition, we examine the viability indicators for each existing crematorium, but particularly for those likely to be affected<sup>6</sup> by the proposed change in industry structure.

It is important to note that we are primarily concerned with improvements in industry performance or maximising industry returns and not necessarily in the distribution of these benefits. That is, we are not concerned if one entity (Cemetery Trust) is made worse off, if all in aggregate are better off<sup>7</sup>.

## 2.4. Financial Viability Assessment Methodology

Evaluation of any proposal requires that the Department undertake a systematic review of the assumptions, inputs and outlook encompassed in the proposal.

### 2.4.1. Component One – Proposal evaluation

For each proposal, the Department must evaluate the viability of the cremation services for that Trust. Each proposal must provide forecasts on the throughputs, revenues and costs for the period used by the model, viz to 2051. We have developed an economic/financial model to cover the longest-lived assets for a proposal, which are likely to be the buildings and twice the life of the primary equipment (the cremators). (Refer Chapter 6 for specification of the model.)

The information provided by the proponent must be translated into the format used by the model. The model is structured to encompass the major drivers of costs and revenues for a cremation operation and the financial estimates provided by the proponents must be allocated to these forms.

In evaluating proposals, it is necessary to make judgements on the allocation of costs to the project and in considering the major drivers for these costs. Judgements are particularly important in allocating the joint and common costs of a facility. In all cases, the most important aspect of the judgement is its rationalisation and documentation. This enables and facilitates later auditing, ready review and reconciliation.

In evaluating a proposal, the information provided by the proponent should be considered its best estimates. The Department must review these estimates and allocations on the basis of its experience and the cost reviews undertaken. Where necessary, the Department may wish to revise these estimates. Again, it will be important to document this process.

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6 Other facilities that lie within the median travel distance (refer Section 4)

7 In economic terms, we are not interested only in Pareto improvements.

The Department must review the rates of return and bankability for the proponent over all time periods shown above. It is likely that for long-lived assets such as cremators, that returns may be inadequate in the short term. In this case, the Department should particularly examine the expected cash balances. While short-term returns may not be crucial, returns earned in the medium and long term must meet hurdle rates. The rates of return for the longest time period represent a “steady-state” rate of return. However, if returns are inadequate in the medium and long term, when the financial outlook is reasonably stable, the entity will be susceptible to “shocks” to the system that may occur. Such shocks would include changing environmental standards, shifts in consumer preferences or adverse movements in major cost elements.

#### 2.4.2. Component Two – Industry evaluation

The industry evaluation comprises the same analysis as for the entrant. However, the entity being evaluated is the industry as a whole. As a result, the base case is the viability of existing crematoria industry. For the purposes of the comparison it is useful to examine the expected net cash balance that the industry expects to generate including the new crematoria.

For the **industry**, the investment can be considered beneficial if it generates a net cash balance in excess of that under the base case across time periods in excess of the short term.

In addition to including the entrant in the economic/financial model, the Department must consider whether other parameters of existing facilities, particularly throughput and price for individual crematoria, require adjustment. This process may be achieved via:

- specific external modelling;
- sensitivity analysis using judgements on the parameters.

External modelling may be undertaken to estimate explicitly the impact of an entrant on existing crematoria and industry parameters. In particular, economic models may be developed to estimate the possible cannibalisation effects.

The Department may alternatively undertake a sensitivity approach that does not require explicit modelling. Such an approach would examine the minimum throughput required to obtain viability for an entrant. This throughput would then be allocated across alternative sources comprising current unmet demand and cannibalisation of existing crematoria.

In addition, the analysis may be extended to the impact on existing crematoria. The Department should review the cash balances for other crematoria to determine if the proposal places existing crematoria in **unbankable** positions.

Examination of the industry and individual impacts may indicate that alternative entry strategies should be examined, such as delayed entry, relocation of assets or merging entities.

#### 2.4.3. Extension to Evaluation of Other Cremation Industry Proposals

The methodology that has been discussed in Section 2.4 is broadly applicable to examine the impact of other potential changes proposed for the industry (eg. expanding operations and price changes). However, for the purposes of exposition, this approach is based only on changes associated with the *investment in a new crematorium*.

In the absence of detailed economic modelling of the cremation market, the impact of price changes can be estimated under an assumption of an unresponsive market. However, particularly where there are alternative suppliers, the customer (the bereaved, but most likely the funeral director) may be influenced by price and direct their custom to lower cost crematoria.

The Department can then evaluate the impacts by undertaking a sensitivity analysis for price changes. The impact will reflect the proportion of cremations that are not tied to each crematorium (no service, no memorialisation, for example).

## 2.5. Market analysis

A key element in examining the viability of the crematoria industry and of potential new investment is the determination of the likely market for these services.

We first assess the operation of the current “market” for services offered by cemeteries and crematoria in Victoria. This includes investigating the degree to which demand for these services is satisfied by the current network of facilities, both now and into the future. This investigation has been undertaken in conjunction with the assessment of the economic performance of these entities (described above). This task also includes an investigation of the market served by each crematorium and, by so doing, the identification of areas of under or over provision.

Once the current market dynamics were established, a range of options for optimising the network were considered. This involved simulating the operation of a range of cemetery/crematoria provision options and comparing the market efficiency of each.

## 2.6. Possible approaches to supply and location of cremation services (‘factory’ vs. ‘full service’)

It is likely that a very small number of cremator units could meet Victoria’s demand under an efficient **centralised approach** where operations are focussed on maximising throughput (e.g. 24 hour operations, separation from other services provided to the bereaved such as chapel services and memorialisation). At the other extreme, a more customer-focussed **local service approach** would see many single-cremator unit crematoria covering the state, maximising availability of service and minimising transport distances for funeral operators and the bereaved.

The task of finding sites which minimise industry costs and maximise possible industry returns is not a trivial task as there are at least four options for modelling crematoria placement. A scorched earth approach would decouple the location decision from the current distribution of cemeteries. In contrast, the scorched node approach accepts that crematoria should be co-located with cemeteries.



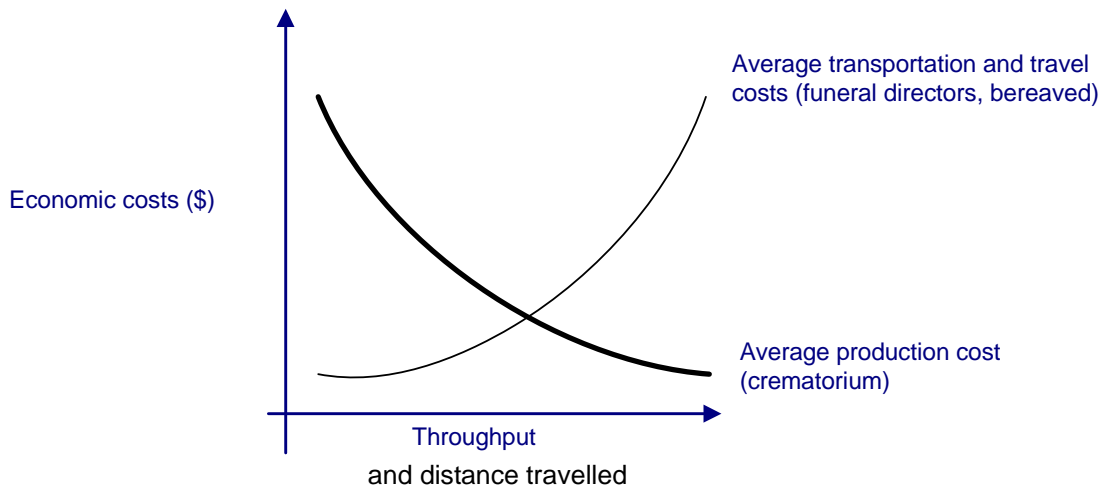
**Figure 1 – Options for geographic placement of crematoria**

	<b>'Scorched earth' approach</b> <i>Optimise network from scratch (useful to defend status quo)</i>	<b>'Scorched node' approach</b> <i>Take status quo arrangement then optimise network from now on</i>
<b>Centralised approach</b>	'Option 1'	'Option 3'
<b>Local service approach</b>	'Option 2'	'Option 4'

Analysis of potential crematoria sites is based upon this scorched node approach, reflecting Victorian government policy to retain crematoria in public ownership and to support cemetery maintenance with cremation revenue. The current operational arrangement lies at a mid-point between a fully local service approach and a fully centralised approach.

Costs associated with cremation that are not borne by the crematorium are not included in this analysis. Such costs, including particularly transport, may change the decision. For example, high transport costs may suggest that more regional crematoria are needed. In contrast, this financial/economic model highlights the high costs associated with low volumes, which would be associated with more regional crematoria.

**Figure 2 – Economic costs and throughput**



## 3. Analysis of Demand for Cremation Services in Victoria

### 3.1. Purpose

This chapter:

- Examines the characteristics and fundamental drivers of demand for the cremation service and their impact.
- Outlines the statistics on the demand for cremation services, including the actuarial estimates for the demand for cremation services through to the year 2051.
- Provides an analysis of demand for cremation services.

### 3.2. The 'Consumer' and Drivers of Demand

#### 3.2.1. Decision to cremate (cremation vs. burial)

The decision to cremate is part of a set of decisions made by the person/persons responsible for the deceased person's 'disposal'. These decisions are usually made by the deceased's family or perhaps close friends, referred to as '**the bereaved**'. In some cases, the decision is made well before death and arrangements made even to the extent of pre-paying for the chosen approach. In this case, the deceased person themselves may have participated in the decision-making process.

However in practice, cremation services, memorialisation and associated chapel services are arranged through **funeral directors** in Victoria. The funeral director often arranges all aspects – the family has no direct contact with the cemetery. The funeral director's functions include:

- collecting, storing and preparing the body;
- arranging the method of disposal (burial or cremation);
- selling caskets;
- arranging chapel services (memorial and/or committal services);
- organising return of ashes.

Funeral directors thus have established relationships with providers of the required products and services, including Cemetery Trusts, casket providers, the clergy, stonemasons, etc.

Importantly, the funeral directors are well-placed to influence the bereaved and the burial/cremation decision.

Our research and anecdotal evidence suggests that cremation charges are a small proportion of the overall cost to the bereaved. *Consequently, the bereaved are unlikely to change their decision between burial and cremation on the basis of the cremation price.* The bereaved, as a consumer, are more concerned with the total price of the package rather than the costs of individual components.

Whilst the bereaved may not be sensitive to the price of cremation, funeral directors are. In particular, funeral directors may obtain different returns from the different aspects of their services. The funeral director is likely to encourage the bereaved to choose the method of disposal that maximises the funeral director's returns.

Therefore due to this bundling of products and services, the funeral director can generally be regarded as the 'customer' when it comes to purchasing cremation (and burial) services, and the bereaved or deceased can be regarded as the 'consumer'.

One aspect that will influence the decision to cremate is the proximity of service providers. This will be particularly the case for an *attended cremation*.

### 3.2.2. Decision on where to cremate

When commencing this project it was assumed that the Victorian crematorium industry operates in much the same way as many traditional market-based activities – namely that 'demand' for cremations is distributed in a manner linked to the underlying residential population and that 'consumers' (users) rationally choose which facility to use based on the comparative benefits and costs associated with the facilities on offer. It was expected that one of the key costs of using a facility would be the associated travel and transportation costs.

It was expected that, where all other things are equal:

- *The more attractive crematorium would be chosen over a less attractive facility* ('attractiveness' includes, for example, price, chapel and other value-added products and services).
- *A closer crematorium would be chosen over one located further away* (i.e. consumers will seek to minimise transportation and other travel costs).

Therefore, it was expected that the potential demand for a crematorium declines with distance and that a classic distance decay relationship applies.

### 3.2.3. Supply-induced demand

However, in the case of crematoria, a further consideration was the impact of *supply-induced demand*. In other words, demand is dependent on supply being available within a reasonable distance of residents, and for some parts of the State, demand is depressed due to an absence of supply.

This issue hinges on the notion of a "reasonable distance". Our research has provided evidence that this notion is a flexible one, particularly in relation to some non-urban areas of the State.

## 3.3. Distribution of Victoria's Population

Victoria's population is unevenly distributed throughout the state (see Map 2.1). Concentrations are found in the Melbourne metropolitan area<sup>8</sup> and the provincial cities and towns located within its hinterland to the west, north, and east.

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<sup>8</sup> For the purposes of this report, the Melbourne Metropolitan Area is assumed to be equivalent to the Melbourne Statistical Division as defined by the ABS at the time of the 2001 Census.

There is also an uneven distribution of those people more likely to die (i.e. older people aged 65 years or older – see Map 2.2). From this map it is clear that there is a significant divide between the ageing areas of the State, particularly those in the outer west, inner Melbourne suburbs and the Mornington Peninsular and the much younger populations to be found in outer Metropolitan suburbs and some regional urban areas.

Population growth is also distributed unevenly (see Map 2.3), roughly corresponding to the areas with a low incidence of older people shown in Map 2.2. Principal areas of growth have been in the outer metropolitan areas, particularly to the north, north-west, and south-east. Outside Melbourne, growth has occurred in central Victoria, but both the outer west and east of the State have experienced decline. Spatial variations in these three factors contribute to the quantum and pattern of deaths forecast for Victoria.

### **3.4. Deaths in Victoria**

#### **3.4.1. Data issues**

A detailed analysis was conducted of the deaths in Victoria using an extract purchased from the Victorian Registry of Births, Deaths and Marriages (BDM). This extract comprised all deaths registered in Victoria during the year 2002. It should be noted that this data set is the only definitive source of information regarding the operation of the industry in Victoria.

This dataset required considerable “cleaning” before it was able to be used for this project. Problems arose because the data did not appear to have been maintained in accordance with the supplied data model. For example, the field for “disposal type” was completed as “Burial/Cremation” for over 90% of all deaths. Clearly there is a critical need to distinguish between these two types of disposal for research of the type conducted for this project.

Fortunately this information was able to be inferred from the “place of disposal – institution” field. However, even this field required considerable processing to render it suitable for analysis. In many instances, the same facilities were described in different ways. A new coding frame was developed to permit this field to be analysed effectively. However, given that information regarding cremations was inferred, a lower level of confidence is associated with its use. It would be more preferable for this data to be recorded definitively in the “disposal type” field.

Further, it would appear to be beneficial for a review to be conducted of the data entry procedures employed by the Registry. The data extract supplied suggests that some fields (eg the place of disposal) are re-typed for each death certificate resulting in a high probability of typographical errors. For example, these are some of the many unique descriptions recorded for one facility:

- Albury City Crematorium, New South Wales
- Albury Crematorium
- Albury Crematorium, Albury NSW
- Albury Crematorium, Albury NSW
- Albury Crematorium, Albury NSW 2640
- Albury Crematorium, Albury, New South Wales

- Albury Crematorium, New South Wales
- Albury Crematorium, NewSouth Wales
- Albury Crematorium, NSW
- Albury Crematorium. NSW

The use of pre-validated field selection lists would avoid many of these data quality issues.

Clearly, if BDM data is to be used in the future to support planning for the crematorium and cemetery industries (and given that it is the only source of this data available at present), it is believed that DHS should consider approaching the BDM as to how best to address issues such as:

- Is the current data model employed by the BDM adequate for current and future industry needs?
- How can the spatial (locational) data fields be improved to enhance understanding and knowledge of the sector's operation?
- How should data management procedures be altered to ensure that future use is not impeded by a need to undertake similar data "cleaning" processes?
- How can data access arrangement be streamlined so that the Department has regular access?

Recommendation 1 – That, given to the very high strategic value to the death care industry of information compiled from death certificates, the Department may wish to consider working with the Victorian Registry of Births, Deaths and Marriages to improve the nature, quality and access arrangements for this information for future planning purposes.

### 3.4.2. Base analysis

Data was also sourced from the ABS concerning all people who had died within Victoria during the same year (2002). From these data it is clear that there were 34,255 deaths registered in Victoria in 2002 (source: BDM) whilst 33,777 people died in Victoria in the same year (source: ABS). Combining these two data sets resulted in data for some 35,329 individual deaths. This data has allowed a number of key questions to be addressed.

Table 2 reveals where people who were registered as dying in Victoria in 2002 came from and how many were cremated. Table 3 shows where these people were buried or cremated.

**Table 2 – Victorian Deaths by State of Usual Residence and Type of Disposal, 2002**

State of Usual Residence	Type of Disposal				Total No. of Deaths
	Cremation (No.)	Cremation (%)	Burial (No.)	Burial (%)	
Unknown	458	2.8%	506	2.7%	964
ACT	4	0.0%	4	0.0%	8
NSW	81	0.5%	136	0.7%	217
QLD	20	0.1%	12	0.1%	32
SA	15	0.1%	18	0.1%	33
TAS	7	0.0%	7	0.0%	14
VIC	15,772	96.4%	18,273	96.4%	34,045
WA	11	0.1%	5	0.0%	16
<b>Total</b>	<b>16,368</b>	<b>100.0%</b>	<b>18,961</b>	<b>100.0%</b>	<b>35,329</b>

Source: BDM and ABS

**Table 3 – Victorian Deaths by State of Disposal and Type of Disposal, 2002**

State of Disposal	Type of Disposal				Total No. of Deaths
	Cremation (No.)	Cremation (%)	Burial (No.)	Burial (%)	
ACT	6	0.0%	5	0.0%	11
NSW	441	2.7%	220	1.2%	661
OVERSEAS	1	0.0%	5	0.0%	6
QLD	8	0.0%	20	0.1%	28
SA	99	0.6%	41	0.2%	140
TAS	8	0.0%	16	0.0%	24
WA	5	0.0%	9	0.0%	14
VIC	15,800	96.6%	18,645	98.4%	34,445
<b>Total</b>	<b>16,368</b>	<b>100.0%</b>	<b>18,961</b>	<b>100.0%</b>	<b>35,329</b>

Source: BDM and ABS

From the above, it is evident that:

- The overwhelmingly vast majority of people dying in Victoria are registered and buried/cremated within the State.
- Slightly in excess of 46% of Victorian deaths result in a cremation, and 96% of these are cremated in Victoria.
- There is limited “exportation” of demand across the Victorian border with less than 3% of Victorian deaths resulting in burials or cremations at interstate facilities (mainly New South Wales and South Australia).

- In comparison, Victorian facilities received in excess of 1,284 deceased interstate residents in the reverse direction (ie buried or cremated in Victoria).

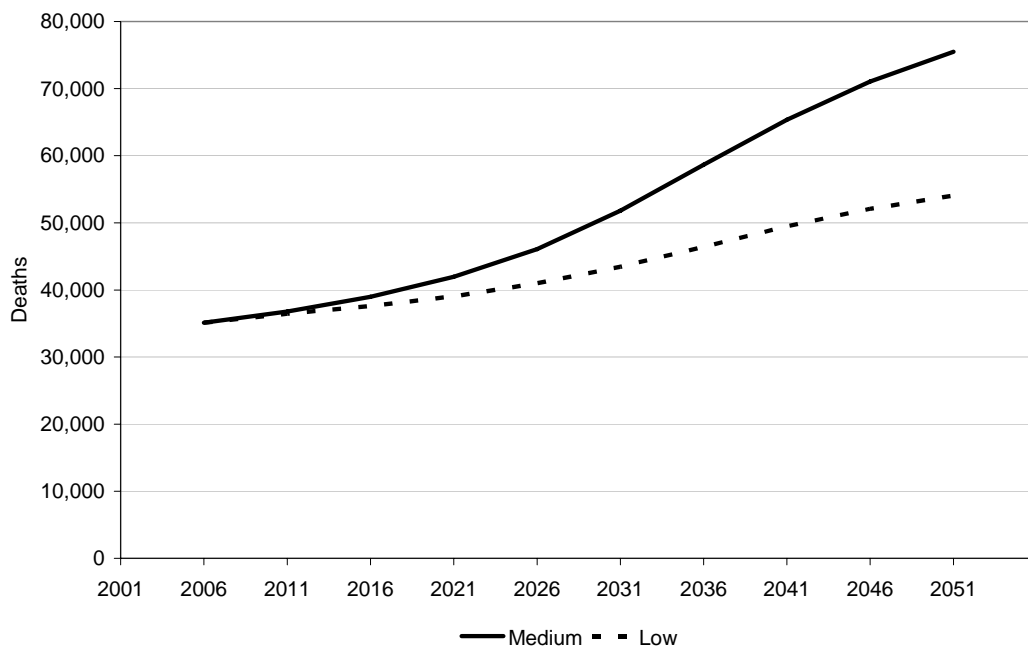
The above analysis indicates that Victoria may therefore be characterised as a generally self-contained market, with only limited interaction along state borders.

The spatial distribution of Victorian deaths is shown in Map 2.4. This map essentially mirrors the pattern evident in the distribution of population presented earlier and is similarly focussed on the Melbourne metropolitan area and provincial cities.

### 3.4.3. Death Forecasts

Figure 3 and Table 4 summarise the expected number of deaths in Victoria for the period 2006 – 2052 (source: CST 2004).

**Figure 3 – Forecast Deaths in Victoria (per annum) - 2006 to 2051**



Source: CST, 2004

**Table 4 – Forecast Deaths in Victoria (per annum) - 2006 to 2051**

Year	Medium Mortality Rate	Low Mortality Rate
2006	35,120	35,120
2011	36,787	36,441
2016	38,964	37,602
2021	41,960	39,063
2026	46,085	40,981
2031	51,819	43,452
2036	58,633	46,417
2041	65,351	49,457
2046	71,060	52,081
2051	75,483	54,074

Source: CST 2004

Two mortality assumptions have been used – a medium projection (adopted by the Victorian Government) and a low projection. The former is considered to be the most likely, and the latter is provided as a conservative baseline estimate (see CST’s report for more details).

Under the medium mortality rate assumption, the annual number of deaths in Victoria is expected to increase at an average rate of 1.64% per annum (compound) over the next 49 years. Under this scenario, deaths will effectively double by 2046 to over 75,000. Under the low mortality rate, total deaths will increase at 0.98% per annum (compound) and will not reach 55,000 deaths per annum by the end of this period.

Map 2.6 illustrates the rate of change expected in the density of deaths over this period under the medium mortality rate forecast series. This map reveals that the areas of the State experiencing the greatest change will be the outer metropolitan areas, as well as districts fringing the metropolitan area (a similar pattern is exhibited under the low mortality rate series).

#### **3.4.4. Place of Cremation**

The combined BDM/ABS data set for 2002 allowed the place of disposal to be determined for Victorians who were cremated (see Table 5). In 2002 over 80% of Victoria’s cremations occurred at five facilities: Springvale, Fawkner, Altona, Bunurong and Lilydale Crematoria (in descending order of throughput).



**Table 5 – Place of Disposal, Victorian Cremations, 2002**

Place of Disposal	No. of Cremations
Springvale Crematorium	6,565
Fawkner Crematorium	2,289
Altona Crematorium	1,911
Bunurong Crematorium	1,498
Lilydale Crematorium	1,089
Geelong Crematorium	857
Ballaarat Crematorium	576
Bendigo Crematorium	538
Traralgon Crematorium	472
Albury Crematorium - New South Wales	184
Moama Crematorium - New South Wales	91
Avondale Crematorium - Albury - New South Wales	70
Coomealla Crematorium - Dareton - New South Wales	70
Carinya Gardens Crematorium - Mount Gambier - South Australia	86
Centennial Park Crematorium - Adelaide - South Australia	12
Wagga Wagga Crematorium - New South Wales	5
Northern Suburbs Crematorium - North Ryde - New South Wales	4
Woronora Crematorium – New South Wales	3
Newcastle Crematorium - Beresfield - New South Wales	2
Other/Not Stated	45
<b>Total</b>	<b>16,367</b>

Source: BDM and ABS

### 3.5. Current Demand for Cremations in Victoria

Table 6 illustrates the numbers of cremations in Victoria in 2002 across the segments used by the spatial analysis.

**Table 6 –Victorian Cremation Levels 2002**

Place of Residence	Urban	Non-Urban	Weighted average
<b>Metro</b>	11,670	539	<b>12,209</b>
<b>Non-Metro</b>	2,072	1,462	<b>3,534</b>
<b>Weighted average</b>	<b>13,742</b>	<b>2,001</b>	<b>15,743*</b>

Source: BDM and ABS

\* The total is reduced from that shown in Table 5 as some cremations could not be geocoded to place of residence.

In general accordance with the overall pattern of population distribution, the demand for cremations in Victoria is concentrated within the Melbourne metropolitan area. This segment is responsible for over three-quarters of all cremations in Victoria.

Figure 4 illustrates examples of locations in each segment of Table 6.

In aggregate, the urbanised areas of Victoria (including much of the Melbourne metropolitan area) contribute nearly 90% of the demand for cremations. As noted earlier, these urban areas will continue to be the focus of Victoria’s population growth, and consequently deaths, into the future. Any consideration of the future demand for crematoria will therefore need to be centred on these areas.

**Figure 4 – Metropolitan and urban examples**

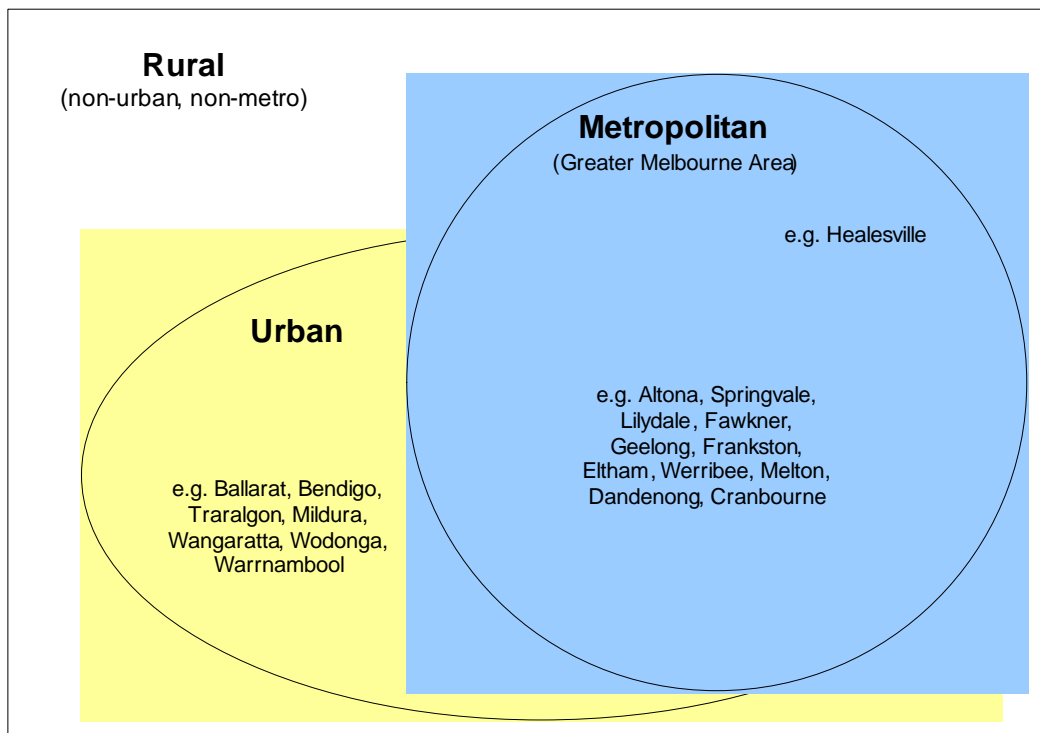
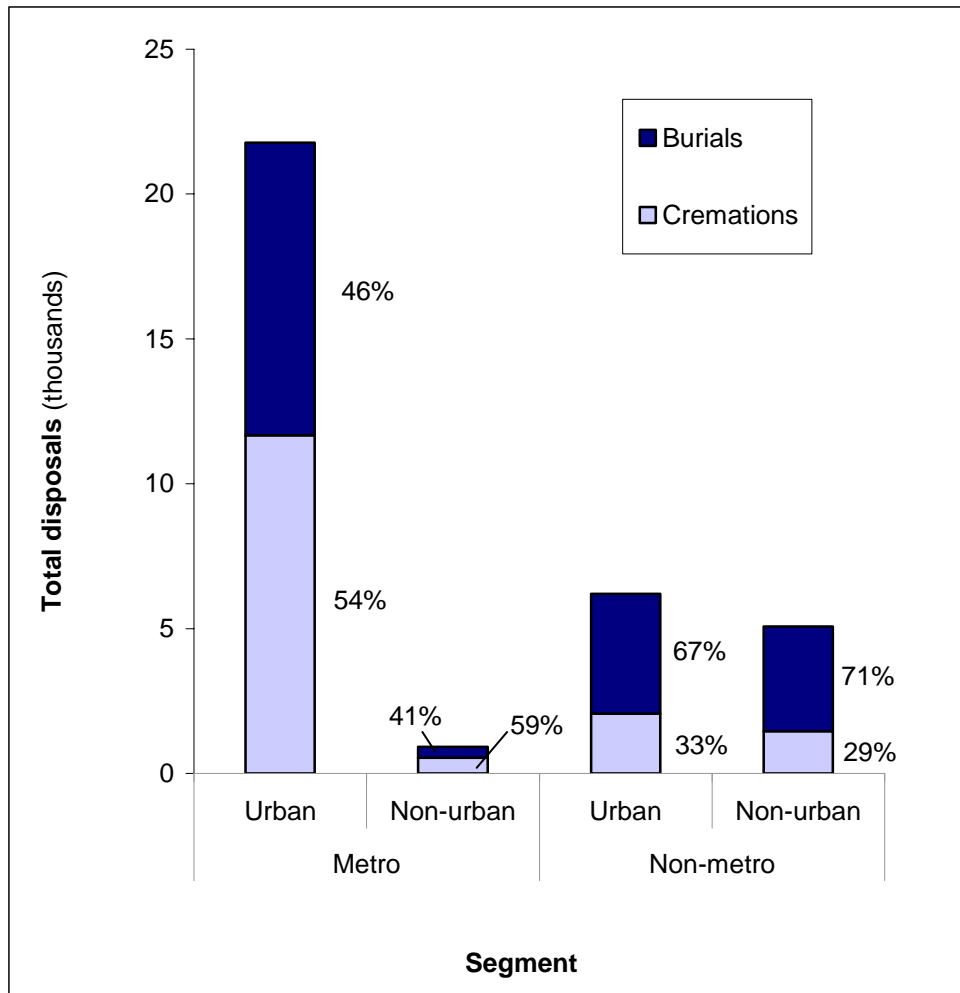


Figure 5 shows the relative use of the two disposal options (cremation and burial) broken down by the four geographical region types used in the spatial analysis. As can be seen, the bulk of cremation and deaths occur in urban areas. The resulting proportions are also shown.

**Figure 5 – Victorian cremations and burials by segment (2002)**



Map 2.7 (reproduced below) illustrates the distribution of cremations across the State using a density index (cremations per 1000 square kilometres). This map demonstrates the extent to which demand is concentrated in and around the major urban areas of the State.

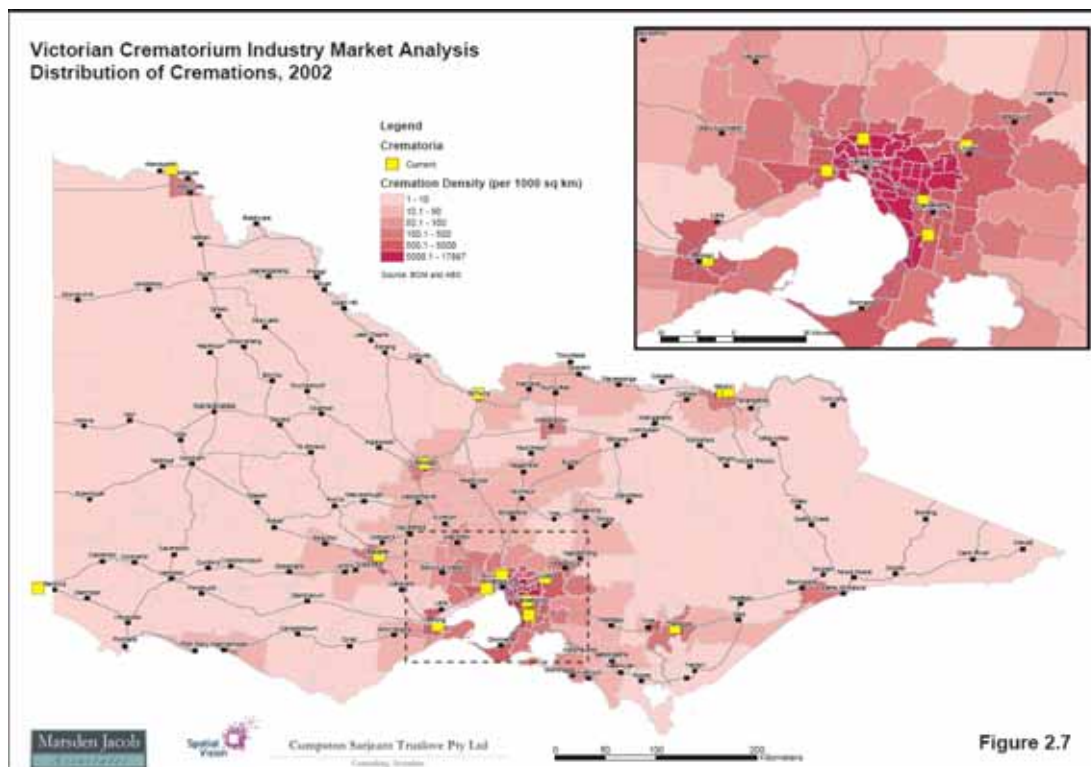


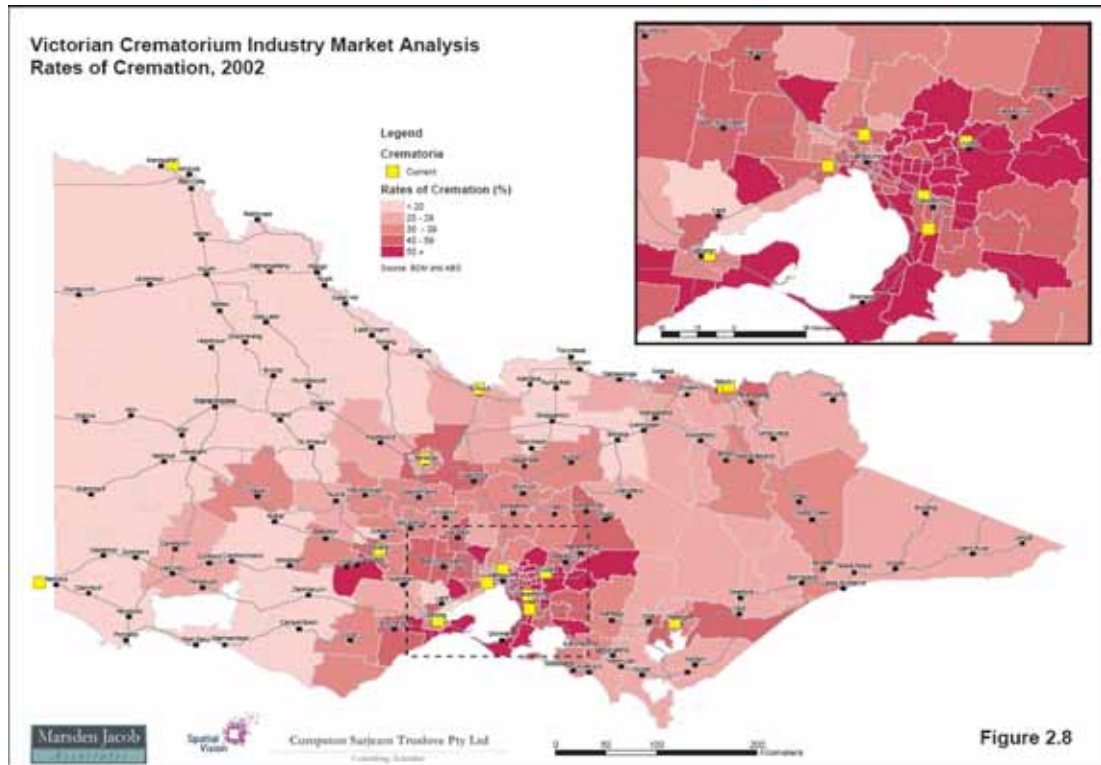
Table 7 shows the same information displayed in Table 6 but shown as a proportion of deaths for each segment. As indicated earlier, slightly in excess of 46% of Victorian deaths result in a cremation. However, this rate is far from even across the State. Cremations are more prevalent in metropolitan rather non-metropolitan locations, and in urban versus non-urban locations.

**Table 7 –Victorian Cremation Rates 2002**

Place of Residence	Urban	Non-Urban	Weighted average
<b>Metro</b>	54%	59%	<b>54%</b>
<b>Non-Metro</b>	33%	29%	<b>31%</b>
<b>Weighted average</b>	<b>49%</b>	<b>33%</b>	<b>46%</b>

Source: BDM and ABS

Map 2.8 shows the distribution of cremation rates across the State on an SLA basis. It is evident from this map and the above tables that cremation rates are greatest in SLAs close to the location of crematoria. There are however, SLAs which are exceptions (i.e., where users are prepared to travel). In other words, high cremation rates are not solely attributable to proximity.



Therefore, it is clear that cremation rates in Victoria are broadly dependent upon the current level of supply of crematoria and that, were additional facilities available in more widespread locations, a larger number of cremations would occur.

## 3.6. Projected Victorian Cremation Rates

### 3.6.1. Basis for Projections

If current cremation rates in Victoria are a function of both the underlying level of demand for such services and the availability of crematoria, then forecasts of future cremation rates need to address the potential impact of additional facilities.

However, given a chief objective of this analysis is to determine whether additional crematoria are required, a degree of circularity in logic is implied: the rate of cremations is dependent on the number of crematoria; the number of crematoria is dependent on cremation rates.

To overcome this problem requires the adoption of a set of working assumptions regarding future cremation rates.

### 3.6.2. Projected Cremation Rates

First, it is important to articulate a number of concepts:

- **Expressed demand:** the level of demand for a good or service actually evident in a market based on a given level of supply (the current level of demand can be thought of as expressed demand).
- **Latent demand:** the level of demand for a good or service were supply to be unlimited.

Given that it is not feasible to increase the level of supply without limit, latent demand is a theoretical level of demand only. Future levels of demand will be based somewhere between the current expressed and the theoretical latent levels of demand.

Based on the foregoing, it is considered that, were the supply of crematoria in Victoria to be unlimited, cremation rates would theoretically increase from the current average of 46% to around 70% (a figure based on the maximum cremation rates evident in the Victorian market in 2002).

This level is not considered feasible in practice. Two additional sets of cremation rates have therefore been adopted for this analysis to explore the potential for additional facilities – a medium rate and a high rate (see Table 8 for details of all three rates). These additional rates have been developed based on the levels of cremation currently being achieved in SLAs that have ready access to crematoria (i.e. where there is ready access to a local facility).

These result in overall State average cremation rates increasing from the current 46% (low rate) to 49% (for the medium cremation rates) and 54% (for the high cremation rates).

**Table 8 – Forecast Victorian Cremation Rates – Low, Medium and High Assumptions**

Place of Residence	Urban (Low, medium, high)	Non-Urban (low, medium, high)	Total (low, medium, high)
<b>Metro</b>	54%/55%/60%	59%/60%/60%	54%/55%/60%
<b>Non-Metro</b>	33%/40%/45%	29%/30%/35%	31%/36%/41%
<b>Total</b>	49%/52%/57%	33%/35%/39%	46%/49%/54%

Source: Spatial Vision

Combined with the two death projection assumptions (medium and low mortality rates), a total of six sets of cremation forecasts have therefore been developed (see Table 9).

**Table 9 – Forecast Victorian Cremation Rates – Assumption Permutations**

Assumed Mortality Rate	Assumed Cremation Rate		
	Medium Mortality/ Low Cremation (current)	Medium Mortality/ Medium Cremation	Medium Mortality/ High Cremation
Low Mortality/ Low Cremation (current)	Low Mortality/ Medium Cremation	Low Mortality/ High Cremation	

The above assumptions regarding mortality rates and cremation rates have been applied resulting in six separate sets of forecasts for cremations in Victoria. These forecasts are summarised in Table 10 below.

From this table, it is evident that the level of demand for cremations is expected to expand significantly over the next 50 years. Assuming mortality rates continue as expected (i.e., the medium mortality assumption) and current cremation rates continue unchanged (i.e., the low cremation rate assumption) total demand for cremations in Victoria is expected to more than double growing from almost 16,000 per annum in 2001 to over 35,000 per annum in 2051. If cremation rates increase (as a result of additional facilities or other factors) this number could rise to over 41,000 cremations per year. If mortality rates however drop below expected levels (i.e., the low mortality assumption) the growth in the volume of cremations may be curtailed to just 27,000 per annum in 2051.

**Table 10 – Forecast Victorian Cremations (per annum) - 2006 to 2051**

Year	Low Cremation (current)		Medium Cremation		High Cremation	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	16,179	16,179	16,955	16,955	18,665	18,665
2011	17,007	16,844	17,855	17,684	19,642	19,448
2016	18,044	17,410	18,986	18,314	20,869	20,126
2021	19,459	18,108	20,501	19,076	22,529	20,951
2026	21,395	18,997	22,577	20,059	24,799	22,042
2031	24,088	20,176	25,446	21,315	27,940	23,395
2036	27,308	21,580	28,856	22,811	31,680	25,042
2041	30,470	23,016	32,238	24,343	35,375	26,717
2046	33,163	24,249	35,139	25,680	38,554	28,176
2051	35,257	25,193	37,420	26,704	41,037	29,297

Source: Spatial Vision

Light grey: Expected cremations under status quo (no new facilities and most likely mortality rate).

### 3.7. Implications

We have generated forecasts for the number of deaths and cremations in Victoria over the next 47 years. Our preferred measure suggests that the number of cremations will reach slightly in excess of 35,200 by 2051. The range of forecasts for that year is 25,200 to 41,000.

Our analysis of cremation demand has shown that it is generally highest in areas served by existing facilities. These areas comprise the Melbourne metropolitan area and urban centres with a crematorium.

Whilst some SLAs in Melbourne recorded below average rates of cremation in 2002, it is evident that this is not due to the distance between the SLA and a crematorium. Further, there is no evidence to suggest any part of the Metropolitan Area is exhibiting unmet need. What unmet demand does appear to exist does not require the expansion of existing facilities. The distribution of these SLAs suggests that it would not be met by the establishment of a new crematorium.

In contrast, the cremation rate in regional Victoria suggests there may be opportunities to expand the reach of cremation by locating crematoria in more country towns. However, while there may be significant unmet demand as a proportion of total deaths across Regional Victoria, there may not be sufficient numbers of cremations to justify any new crematoria in any location.

Whether sufficient deaths (and potential cremations) occur within the 'natural' catchment area of any new crematorium will need to be examined. An analysis of the sources of cremations for each crematorium is considered in the Chapter 4. These two analyses form the basis for the review of potential crematoria in Chapters 9 and 10.

## 4. Analysis of Supply of Cremation Services in Victoria

### 4.1. Overview

Victoria currently has nine Cemetery Trusts which currently operate 21 cremator units across the state – see Figure 6. Their market share is summarised in Figure 7.

**Figure 6 – Throughput and scale of Victorian crematoria (2003)**

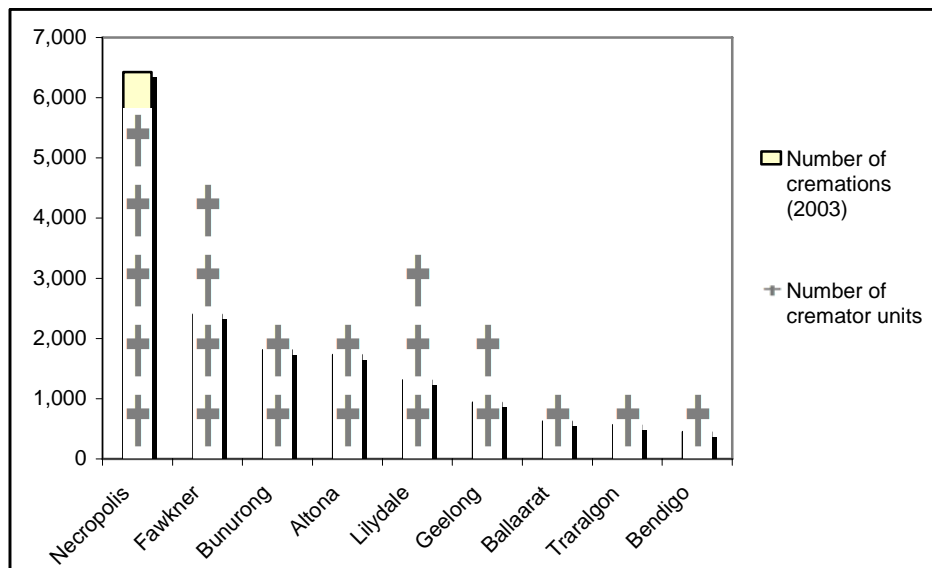
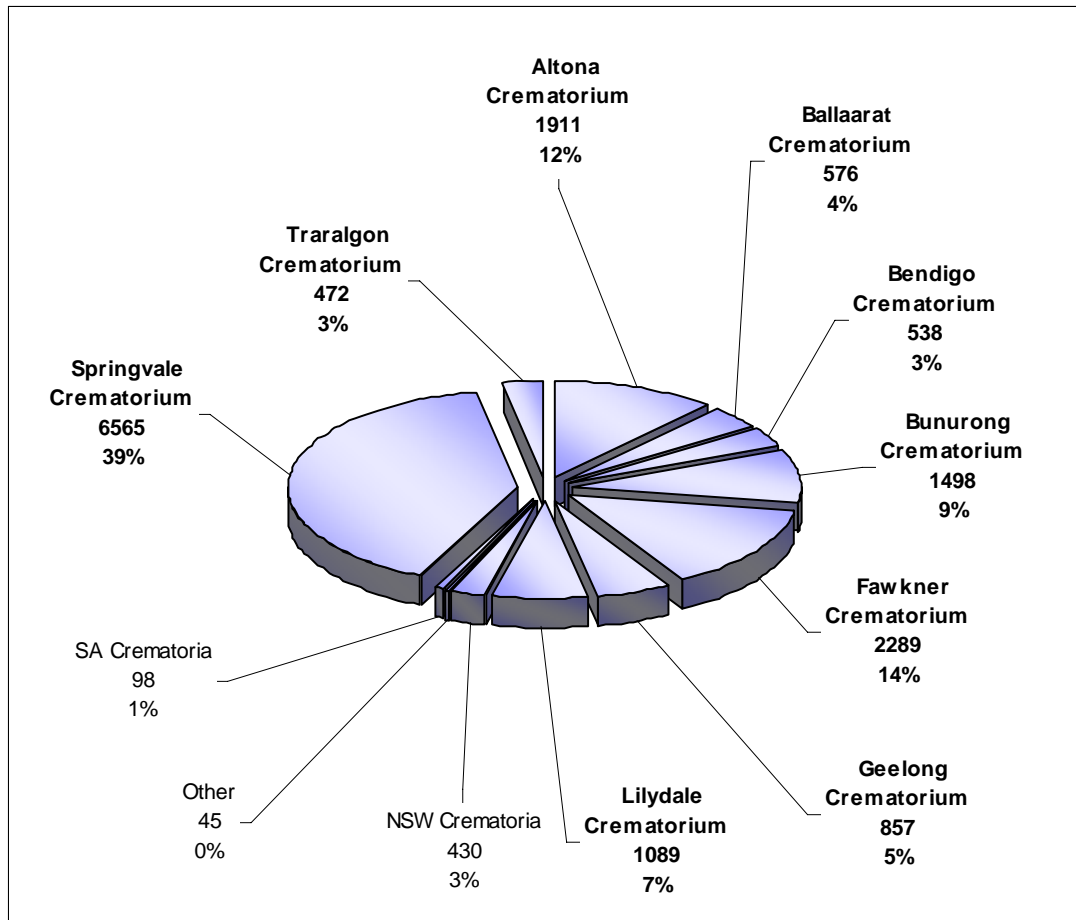




Figure 7 – Victorian Cremation Market Share (2002)



#### 4.2. Differentiating between Metropolitan and Regional Crematoria

For the purposes of this analysis, the sites administered by the Ballaarat, Bendigo and Traralgon Trusts are considered outside of the Melbourne Metropolitan area, or as ‘regional’. All other sites are considered to lie within the Melbourne Metropolitan area.

Within these groupings, the crematoria have a similar range and scale of operations. The metropolitan crematoria have up to five cremator units, provide ancillary services and have significant dedicated staff. They face competition, often with several crematoria in the vicinity.

In contrast, Victoria’s regional crematoria have a lower throughput, with one cremator unit operated by one or two staff on a part-time basis. They service a very large geographic catchment and experience virtually no competition.

The Victorian crematoria primarily provide a service for Victorians. However, a small proportion of Victorians are cremated at facilities just across the borders of New South Wales and South Australia. These interstate cremations account for significant proportions of those cremated in Victorian regional areas which are not serviced by Victorian crematoria.

### 4.3. Patterns of Supply by Victorian Crematoria (2002)

The following section outlines the current pattern of operation for each of the nine Victorian crematoria, as well as a number of interstate facilities impacting on the Victorian market.

This analysis is based on the 2002 BDM/ABS data set described earlier. In particular, it makes use of data regarding the “place of usual residence”, aggregated by SLA. This data has been used as an indicator of the likely distances involved in transportation prior to disposal. We are not aware of any other data available from the Registry of Births, Deaths & Marriages or ABS that could have been used for this purpose.

In addition to the crematoria operating within Victoria, there are further facilities located immediately outside the state boundary at:

- Mount Gambier (just over the SA border)
- Dareton (just over the NSW border near Mildura)
- Moama (just over the NSW border near Echuca)
- Albury (just over the NSW border near Wodonga)

#### 4.3.1. Altona Crematorium

In 2002, the Altona Crematorium conducted 1,911 cremations, equivalent to 11.7% of all Victorian cremations for that year.

The facility is located in Melbourne’s western suburbs and draws patronage principally from the western suburbs of the Melbourne Metropolitan Area. However, the facility also draws patronage from parts of Geelong and districts adjoining the western Metro boundary (see Map 3.1).

Altona’s share of market demand for cremations on an SLA basis is shown in Map 3.2 and as a smoothed “market share” surface<sup>9</sup> in Map 3.3.

From these maps the role played by Altona in the sparsely populated western and northern districts of Victoria is clearly evident, as well its participation a number of other areas of the State.

Importantly, for over 85% of the cremations conducted at Altona, the distance between the usual place of residence and the Altona facility was in less than 40 kilometres. The median<sup>10</sup> distance travelled by patrons was just 16 kilometres. These statistics confirm that notwithstanding its reach into rural districts, this facility generally serves a comparatively confined service area based on Altona.

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<sup>9</sup> This surface has been derived from the market share values depicted in Figure 3.2 by using spatial smoothing techniques (the fitting of a two-dimensional minimum curvature spline interpolation to the market share data). The resultant surface provides an extrapolated range of values between each of the SLAs. The derived values are no longer meaningful in absolute terms but reveal significant relative variations.

<sup>10</sup> The median distance is the distance at which exactly half a facility’s cremations travel more and half travel less. In other words, it is the distance with a percentile rank of 50. This measure has been adopted (rather than, say, the mean) as the median distance prescribes exactly half the service area of a facility.

### 4.3.2. Bunurong Crematorium

In 2002, the Bunurong Crematorium conducted 1,498 cremations, equivalent to 9.2% of all Victorian cremations for that year.

The facility is located in Melbourne's south eastern suburbs, just south of Dandenong (and the Springvale facility), and principally draws patronage from the southern Melbourne Metropolitan Area and the Mornington Peninsula (see Map 3.4).

The facility's share of market demand for cremations is comparatively limited and only achieves dominance in parts of the Mornington Peninsula (see Map 3.5 and Map 3.6).

For Bunurong, the median distance travelled is 13 kilometres. Almost 90% of patronage is derived from people who have lived within 40 kilometres of the facility.

### 4.3.3. Fawkner Crematorium

The Fawkner Crematorium conducted 2,289 cremations in 2002, equivalent to 14.0% of all Victorian cremations.

The facility is located in Melbourne's northern suburbs, and draws patronage from northern Melbourne metropolitan area and from along the corridors formed by the Hume, Calder and, to a lesser degree, the McIvor Highways (see Map 3.7).

The facility's share of the market for cremations is greatest in the northern half of the Melbourne metropolitan area. Its share of the non-metropolitan market spreads through the central and northern areas of the State (see Map 3.8 and Map 3.9).

The median distance between the usual place of residence and the Fawkner facility is 8 kilometres. Over 80% of all cremations at Fawkner involve distances of less than 20 kilometres.

### 4.3.4. Geelong Crematorium

The crematorium at Geelong conducted some 857 cremations in 2002 equivalent to 5.2% of all Victorian cremations.

This facility draws its patronage from an area focussed on Geelong and the Surf Coast (see Map 3.10). This facility is also a provider to communities along the south west coast with significant shares of the market in some of these districts (see Map 3.11 and Map 3.12).

The median distance travelled to the Geelong crematorium is just 7 kilometres. Almost 80% of cremations at Geelong involve distances of less than 20 kilometres confirming that this facility services a concentrated area.

### 4.3.5. Lilydale Crematorium

A total of 1,089 cremations were conducted at Lilydale in 2002, equivalent to 9.2% of all Victorian cremations.

The facility is located in Melbourne's outer eastern suburbs, and draws patronage principally from these suburbs and the corridor formed by the Maroondah Highway (see Map 3.13).

The facility's share of the market for cremations is comparatively restricted to this corridor (see Map 3.14 and Map 3.15).

The median distance travelled to the Lilydale facility is 13 kilometres. Over 75% of all cremations at Lilydale involve distances of less than 20 kilometres.

#### **4.3.6. Springvale Crematorium**

The crematorium at Springvale conducted some 6,565 cremations in 2002, equivalent to over 40% of all Victorian cremations.

The facility is located in Melbourne's south eastern suburbs, north of Dandenong (and the Bunurong facility), and draws its patronage from the eastern and southern Melbourne Metropolitan Area, the Mornington Peninsula and much of the eastern districts of the State (see Map 3.16).

Given the throughput of the facility and its overall share of the Victorian market, its share of regional markets is extensive (see Map 3.17 and Map 3.18).

The median distance travelled to the Springvale facility is 14 kilometres.

#### **4.3.7. Ballarat Crematorium**

The Ballarat Crematorium conducted some 576 cremations in 2002 equivalent to 3.5% of all Victorian cremations.

The facility draws its patronage from an area focussed on Ballarat and districts to the west (see Map 3.19). Whilst the throughput of the facility is limited, it is a major provider in much of the central west of the State (see Map 3.20 and Map 3.21). Its reach to the west of Warrnambool is restricted by the Mt Gambier facility.

As might be expected in rural setting, the median distance between the usual place of residence and the Ballarat crematorium is higher than for metropolitan crematoria. However with most cremations coming from within 20 kilometres, Ballarat retains a reasonably tight core market..

#### **4.3.8. Bendigo Crematorium**

The Bendigo Crematorium conducted some 538 cremations in 2002 equivalent to 3.3% of all Victorian cremations.

The facility draws its patronage from a large area focussed on Bendigo (see Map 3.22). Whilst the through-put of the facility is limited, it is a significant provider in the central west of the State (see Map 3.23 and Map 3.24).

The median distance travelled to the Bendigo crematorium is 38 kilometres. Whilst over 40% of all cremations at Bendigo involve distances of less than 20 kilometres, there are significant peaks at other distances reflecting the role of this facility in servicing surrounding townships without a crematorium some 50 to 200 kilometres away.

#### **4.3.9. Traralgon Crematorium**

Some 472 cremations were conducted at the Traralgon crematorium in 2002 equivalent to just 2.9% of all Victorian cremations.

This facility draws patronage from a widely dispersed area focussed on Bairnsdale, including Sale and Lakes Entrance (see Map 3.25).

This facility is a significant provider to communities along the south east coast with a strong share of the market in this part of the State (see Map 3.26 and Map 3.27).

The median distance travelled to the Traralgon crematorium is 43 kilometres. A significant proportion (45%) of cremations is derived from the township of Traralgon itself. The balance comes from the surrounding townships such as Warragul, Wonthaggi, Leongatha, Moe, Foster, Yarram, Sale, Bairnsdale and Stratford with concentrations located approximately 50 and 100 kilometres away from the facility.

#### **4.3.10. Moama Crematorium**

*It must be noted that the analysis of interstate facilities is based on Victorian deaths only and omits cremation demand from the home states of these facilities.*

A total of 83 Victorians were cremated at the Moama crematorium in 2002.

This facility draws patronage from an area focussed on Echuca and, to a lesser degree, Shepparton (see Map 3.28). This throughput of this facility represents just 0.5% of all Victorian cremations.

This facility is a significant provider to communities in rural areas surrounding these towns (see Map 3.29 and Map 3.30).

The median distance travelled to this facility was 24 kilometres.

#### **4.3.11. Dareton Crematorium**

The Crematorium at Dareton, over the New South Wales border near Mildura, conducted 70 cremations for Victorians in 2002, equivalent to 0.4% of the overall Victorian market.

The facility services communities at Mildura, Wentworth and Red Cliffs and surround districts (see Map 3.31). It is a significant provider in this very small market in most areas of the extreme north west of the State (see Map 3.32 and Map 3.33).

The median distance travelled by Victorians to this facility is 9.9 kilometres. Only a small proportion of the cremations conducted at this facility originated outside of Mildura.

#### **4.3.12. Albury Crematoria**

Data for the two crematoria located in Albury have been combined for this analysis.

Some 254 Victorian cremations were conducted at the two Albury crematoria in 2002 equivalent to 1.5% of all Victorian cremations.

This facility draws patronage from an area focussed on Albury/Wodonga (see Map 3.34). This facility is a significant provider to the surrounding north-eastern part of Victoria, even stretching west past Wangaratta to Benalla (see Map 3.35 and Map 3.36).

The median distance travelled to Albury crematoria is 58 kilometres.

### 4.3.13. Mount Gambier Crematorium

Some 86 Victorian cremations were conducted at the Mt Gambier crematorium in 2002 equivalent to 0.5% of all Victorian cremations.

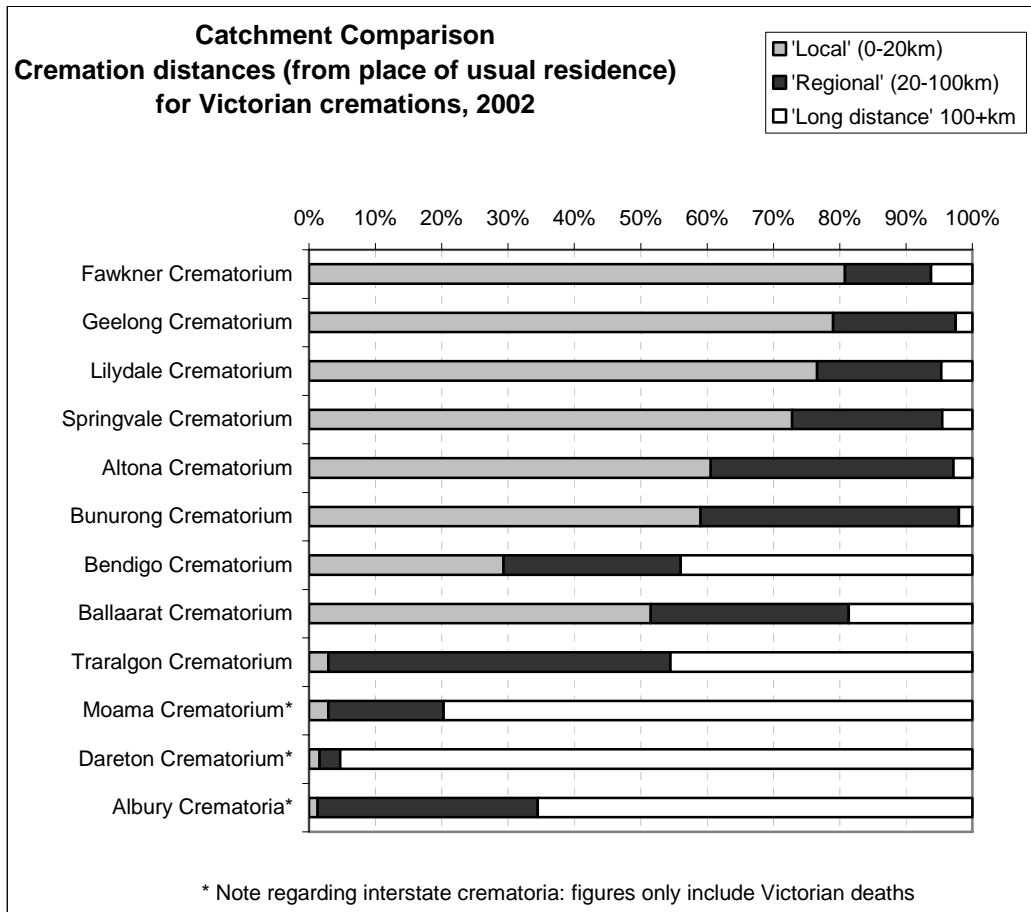
This facility draws patronage from an area focussed on the extreme western districts of the State (see Map 3.37). This facility is not a significant provider to these communities but derives a small share of the regional market (see Map 3.38 and Map 3.39).

The median distance travelled is 88 kilometres.

## 4.4. Summary of Travel Distances

The statistics compiled on travel distances are summarised in Figure 8. Full details are provided in the report by Spatial Vision.

**Figure 8 – Travel distances summary**



As can be seen from the Figure, for all metropolitan crematoria, between 60% and 80% of cremations come from people residing within 20km of the facility. In regional Victoria the majority travel well in excess of this distance.

Table 11 shows the median distance travelled for each crematorium.

**Table 11 – Median Distance Travelled to Regional Crematoria, 2002**

Facility	Distance (kilometres)
Altona	16
Bunurong	13
Fawkner	8
Geelong	7
Lilydale	13
Springvale	14
Ballaarat	20
Bendigo	38
Traralgon	43
Moama (NSW)	24
Dareton (NSW)	10
Albury (NSW)	58
Mount Gambier (SA)	88

Source: BDM/ABS

#### 4.5. Overall Market Allocation

Map 3.40 attempts to summarise the overall distribution of the Victorian cremation market in a single map. It depicts those areas in which a facility has the largest market share (i.e. areas in which the facility is the *dominant provider*).

The areas shown on this map are not the ‘catchments’ of each facility – clearly some of these facilities draw patronage (in some cases significant patronage) from other areas. However, this map does highlight districts of strength for each crematorium.

Note that whilst some facilities draw custom from more distant areas, these areas are often less populous and may generate only modest demand for cremations.

#### 4.6. Measurement of Cremation Industry Capacity

Levels of cremator capacity may be assessed against:

- the technical design capacity of the equipment, operated in a continuous shift basis;
- the optimal operational and economic level of capacity use; or
- current ‘standard practices’.

Current standard practice in Victoria is for cremators to operate for a single daily shift.

Capacity is based on an indicative capacity using a standardised single-shift working day with seven cremations per day and working for five working days per week for 252 working days per year.<sup>11</sup> Actual work practices vary slightly across the crematoria with some crematoria capable of greater capacity (through agreements to work 5.5 days per week) or lesser capacity (two small crematoria operate at five and six cremations per day).

Across Victoria there are nine sites and 21 cremator units. Table 12 shows the current operating situation for Victorian crematoria.

#### 4.7. Current Victorian Cremation Industry Utilisation Levels

We have compared actual throughput for 2003 with the indicative level of utilisation.

**Table 12 – Victorian cremation industry indicative capacity & utilisation**

Crematorium	Cremations (2003)	Cremator Units	Cremations per Unit (2003)	Indicative Capacity*	Utilisation Level
Altona	1,729	2	864	3,528	49%
Bunurong	1,807	2	903	3,528	51%
Fawkner	2,396	4	599	7,056	34%
Lilydale	1,309	3	436	3,780	35%
Springvale	6,425	5	1,285	8,820	73%
Geelong	933	2	466	3,528	26%
Ballaarat	620	1	620	1,764	35%
Bendigo	446	1	446	1,764	25%
Traralgon	565	1	565	1,512	37%
Total	16,230	21	772	35,280	43%

\* Assumes a working year of 252 days. All furnaces assumed to achieve seven cremations per day except Lilydale (five) and Traralgon (six).

The industry has the capacity to achieve an aggregate well in excess of 30,000 cremations per annum at standard utilisation rates. Given the projected cremations for Victoria in the year 2051 repeated in Table 13, range from 25,193 (low mortality and low cremation rate) to 41,037 (medium mortality, high cremation rate), it is clear that there is sufficient capacity within the current industry to cope with virtually all of the expected growth in demand for at least the next 45 to 50 years. Given continued growth at expected rates the number of cremations is unlikely to reach 30,000 until at least 2080.

<sup>11</sup> This is equivalent to 261 potential working days less holidays for Christmas, Boxing Day, New Years Day, Australia Day, ANZAC Day, Good Friday and Easter Monday, Queens Birthday and Melbourne Cup Day (or equivalent in regional Victoria). Actual working days in any year may vary slightly from this, but was not considered material to the calculation.



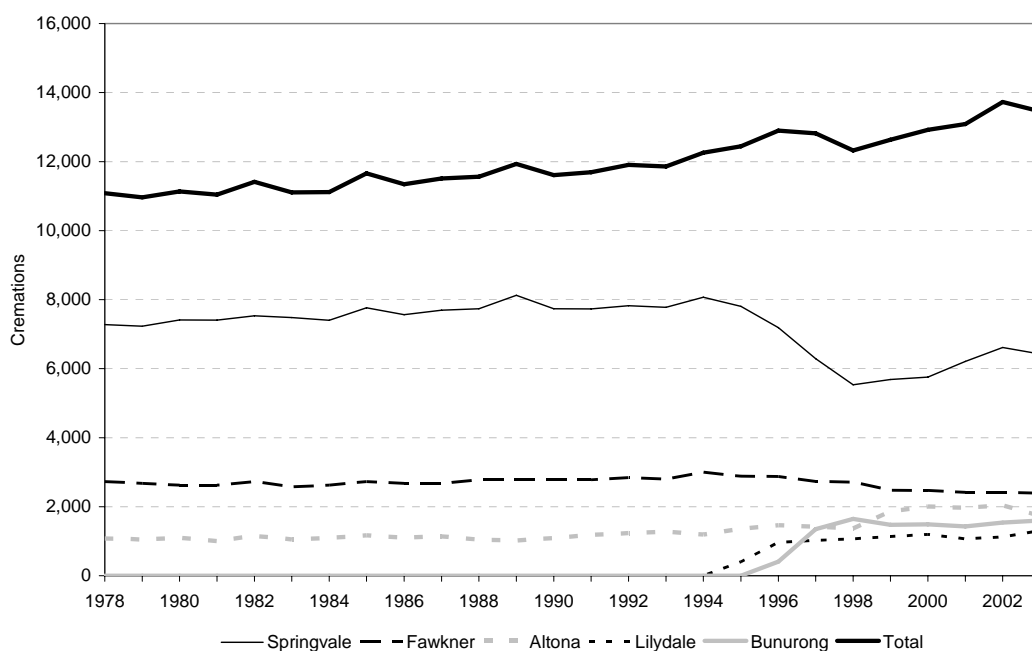
**Table 13 : Forecast cremation numbers**

Year	Low Cremation (current)		Medium Cremation		High Cremation	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	16,179	16,179	16,955	16,955	18,665	18,665
2026	21,395	18,997	22,577	20,059	24,799	22,042
2051	35,257	25,193	37,420	26,704	41,037	29,297

Source: CST (2004)

The detailed actuarial and spatial analysis is consistent with a simple analysis of the growth in cremations in the stable Melbourne market since 1978. Over that period, there has been significant increase in the relative proximity of cremation facilities (with Lilydale and Bunurong commencing in the past decade).<sup>12</sup> Annual growth has averaged 0.78%; even including all of Geelong’s cremations as growth in the metropolitan market only increases this rate to 1.05%.

**Figure 9 – Cremations in Melbourne**



Source: Information provided by Melbourne Cemetery Trusts with crematoria, 2004.

A different story might be obtained from only focussing on the past five years. In the past five years, growth has averaged around 3% pa across these five crematoria. Were this rate of growth to continue in these Melbourne crematoria, then the indicative capacity of 28,200 would be reached by 2025.

<sup>12</sup> Geelong was not included reflecting the limited number of cremations from people in the main areas serviced by other metropolitan crematoria. In 2003, of 932 cremations at Geelong, only 15 were of those whose previous address postcode ranged from 3000 to 3207. This was confirmed in discussions with Trust representatives which suggested that the main impact of Geelong’s entry was on Ballarat.

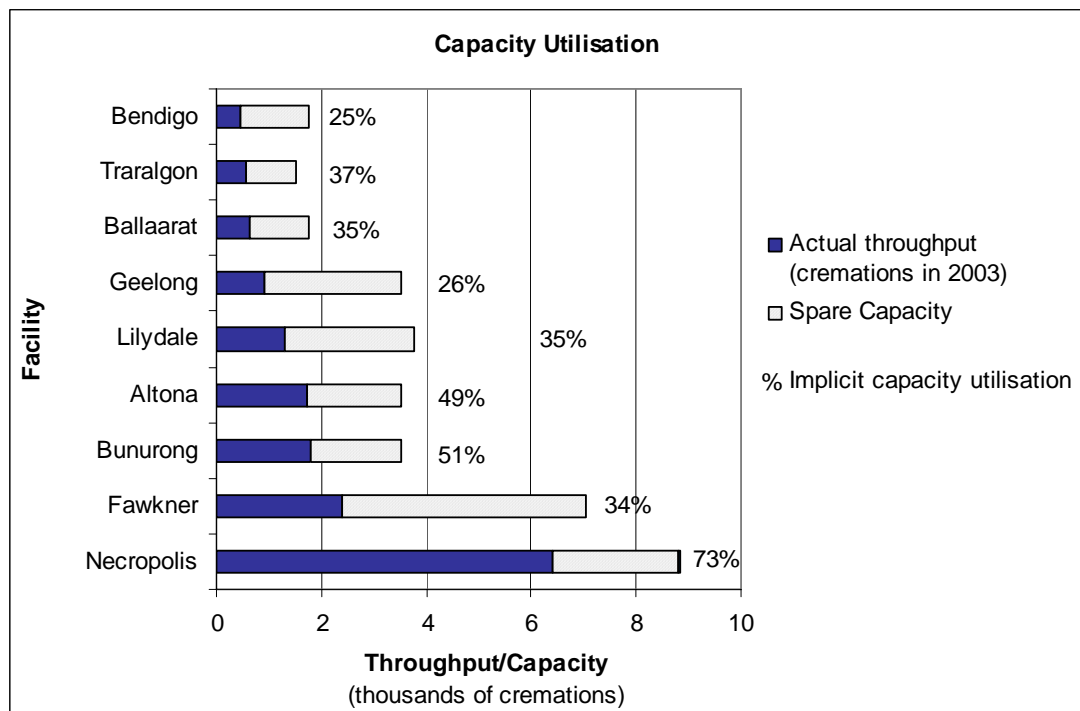
However, this growth rate is likely to be unrepresentative as the period on which it is based:

- starts in a local trough in cremation numbers (the average annual growth rate since 1994 is about 1.8%)<sup>13</sup>; and
- includes cremation numbers that are likely to be inflated by the practice of transportation.

Therefore, it is clear that there is significant surplus capacity within the current crematorium industry in Victoria. The current throughput in Victoria could be handled, operationally and economically, by fewer cremators than the 21 currently operated.

The number and location of crematoria that are 'required' in practice is determined by the approach taken by the government and industry in supplying cremation services to Victorians. This approach must balance political, economic and financial concerns, including community expectations and values, the concerns of private operators in related industries (e.g. funeral directors) and the operational and financial concerns of Cemetery Trusts.

**Figure 10 – Notional Victorian cremation industry utilisation**



#### 4.7.1. Levelising throughput

In practice, demand for cremations can be erratic, particularly for smaller crematoria, and seasonal (higher number of deaths in winter). Demand on any one day may not therefore be close to this average. Use of a cool room can smooth this demand pattern. A cool room however is only appropriate where there are no time restrictions on the cremation.

<sup>13</sup> At this lower rate of growth though still more than double historical rates, capacity won't be reached until 2040.

Many crematoria have a policy of cremating on the same day as receipt. For these crematoria, under this policy they must maintain sufficient capacity to meet the likely peaks in demand, irrespective of the preferences of the cremation organisers. Where a cremation is attended, there are typically preferred times for attendees, such as early afternoon. As a further issue, crematoria staff noted that they may receive little notice and possibly no consideration from funeral directors for cremations.

#### 4.8. Whole-of-state Capacity Analysis

As an alternative to the current configuration of crematoria spread across the metropolitan area and the State, cremations might be conducted in a more centralised location that could service the entire Victorian market (refer Section 2.6). This could take advantage of any cost savings associated such as from locating in a single building, reducing the level of spare capacity to account for irregular spikes in demand and running multiple shifts to reduce the average cost of the major cost of the cremator units. Such a model would be much less likely to meet the demand by the organisers of the cremation to attend a committal service immediately preceding a cremation.

Disregarding geographic factors (such as transport costs), a very few cremators could handle the entire Victorian *existing* demand. Indeed, even if all burials were to cease and were to be replaced by cremation, there is currently sufficient installed capacity to handle all Victorian deaths within the indicative capacity outlined above.

Further, the existing excess capacity is unlikely to be taken up within the life of existing cremator units, viz 20-30 years.

**Table 14 – Number of cremators required to meet total demand**

<i>Number of shifts per day</i>	<i>Number of cremator units required</i>
Standard 8 hour shift	9
Two x 8 hour shifts	5
24 hour operation (three x 8 hour shifts)	3

Note: This analysis makes the following assumptions:

- a standard five-day working week (Monday to Friday);
- current Victorian demand levels (approximately 16,000 in 2003);
- use of high-volume cremator units (typical Major or Newton units as currently used by the majority of the Victorian industry).

## 4.9. Implications

Current capacity in Victoria is sufficient to meet demand through the forecast period. Indeed, it may be sufficient to meet demand until 2080. This conclusion is dependent on the rate of cremation remaining within experienced levels for the forecast period. If there were to be a significant shift in demand, say cremations increased at the most recent (unsustainable) rate, then demand would exceed capacity by around 2035 – 2040. Even so, the current configuration of furnaces could still meet demand by working more than one shift per day.

## 5. Elements of Crematorium Viability

In developing a financial/economic model of the Victorian ‘cremation industry’ it is necessary to identify:

- the major elements of crematoria operations;
- the drivers of changes in their levels;
- a definition of viability for any business; and
- how the definition of viability applies to the cremation industry.

### 5.1. Approach to Assessing Victorian Crematorium Viability

In developing a model of crematoria financial viability, it is important to identify what we mean by viability. The major theoretical stream that informs this process is economic regulation, and price regulation in particular. Australian competition policy relies on economic regulation to **promote efficient use of resources**. While this goal is not an explicit aim of this project, it provides insights between different types of costs and prices (and therefore viability).

The general approach of competition policy in Australia has been to set regulated prices to ensure that consumers are not paying more than an **efficient price** for any service. Economic theory suggests that under competitive conditions, economic welfare is maximised where the price paid for a product is set equal to the **marginal** (or direct or incremental) **cost** of supplying it. This however ignores the supply side of the equation. An efficient service provider should receive sufficient **return on its investment** that encourages it to continue providing the service.

A first estimate of the efficient cost of provision would be if the cremation services were provided on a standalone basis. Such an operation would have a number of elements that would be similar to current arrangements. It is likely that power, crematorium staff and building costs would be the same. However, a standalone crematorium would have its own administration infrastructure including office accommodation, administrative staff, maintenance and other overheads. Further, the standalone estimate will include higher costs that could have been shared across all operations of a joint operation. This is likely to lead to higher average costs as the service doesn’t take advantage of economies of scale or scope.

For example, a manager will require an office whether s/he is working on cremations or all cemetery work. Where a building is used for a number of functions, the additional cost of extra office is less than the average cost of its area (scale economy). Similarly, a worker trained to perform administrative duties for a cemetery is likely to be able to use her/his skills for cremation administration (scope economies).

The total cost associated with the provision of a standalone cremation operation provides an **upper bound estimate** of the efficient cost of provision.

Alternatively to this upper bound estimate, a business may be considered viable if it can generate sufficient revenue to meet its current and future obligations. These obligations would include its direct operating costs in addition to raising sufficient revenue to finance its future capital replacement and maintenance. However, where this differs from most businesses is that the business does not make payments to existing equity. In this case, previous investments are treated as **bygones** and in the case of part of a business the segment may not make a contribution to **common costs**. The key components are to estimate the **direct costs** of cremation and allocate the **incremental increase** in common costs associated with cremation. This approach is focussed on ensuring the existing infrastructure is used, replaced and can be maintained. This approach obtains a **lower bound estimate** of the efficient cost of provision.

It may be useful to outline some examples of incremental common costs. If roads in a cemetery require resurfacing every five years when traffic is solely cemetery-related but every four years when cremations are conducted, the **incremental cost** is the difference between funding resurfacing every five years and every four years. Second, administrative buildings require repainting every ten years. If undertaking cremations has no effect on this requirement (as we would expect), then the cost of painting would not be allocated to cremations.

These two extremes also represent the upper and lower bounds for 'efficient' pricing under National Competition Policy water policy. Both upper and lower bound estimates are somewhat unrealistic. With regard to lower bound pricing, we would expect the crematoria businesses to price above that to meet its on-going operations and expect it to contribute to the overall return to existing assets of the cemetery and meet some portion of the costs common across each cemetery trust. With regard to a standalone operation, we would expect a crematorium to take advantage of existing cemetery operations and generate economies of scale and scope that can be shared throughout the cemetery.

There is a further confounding element. Under current policy, all crematorium are operated by cemetery trusts. Further, all cemetery trusts are responsible for the on-going maintenance of its cemetery (and any cemeteries allocated to it). If we consider this a purely cemetery cost, then it is not relevant to the cost of a crematorium. However, as it IS considered a component of the cost of operating a cemetery, it must be considered in the costing of the crematorium.

#### 5.1.1. Allocation of common costs

Across a multi-product business, the provision of a service will entail costs directly associated with its production and costs that are not directly related to production (common costs – typically, administration costs). These common costs must be recovered from all of the operations of the business. The allocation of the common costs can be approached in a number of ways.

For private competitive businesses, it is left up to the business to decide how it recovers its common costs. Economic theory suggests that these costs will be recovered from those areas which are best able to bear the allocation.<sup>14</sup> This approach is mirrored in regulation theory by the application of the inverse elasticity rule which derived from Ramsey's analysis of efficient taxation.<sup>15</sup>

For regulated firms with large fixed costs, it is likely that setting its price at the marginal cost of supply will lead to under-recovery compared with total costs. While economic efficiency is maximised where prices are set to marginal cost, distortions can be minimised by allocating fixed costs to charges that have the least effect on demand. The inverse elasticity rule says that across different products or markets for a firm, the mark-up for each product/market should be inversely proportional to its elasticity of demand.<sup>16</sup>

This approach suffers due to the need to estimate the elasticities – usually requiring extensive econometric analysis and subject to dispute. Typically, elasticity analysis is undertaken at the industry level or where there are issues of market dominance. Despite this, most private businesses will have a 'feel' for its ability to increase margins for each of its products.

In the case of Cemetery Trusts, it may be efficient for the Trust to allocate its overheads such that the more responsive product/market receives a lower proportion of fixed costs than a less responsive product/markets. We expect the trusts to be in the best position to identify the relative responsiveness of these markets.

An alternative approach particularly used in accounting treatments of overheads is to allocate the costs using measurable **indicators of use**. These indicators may provide insight into drivers of common costs. For example, some Cemetery Trusts have allocated their administrative costs on the basis of relative numbers of burials and cremations.<sup>17</sup> If each burial or cremation generates a similar amount of work for an administrative person, this may be a reasonable estimate of the extra cost associated with each burial/cremation. However, we are unaware of any workflow analysis in the Victorian industry that demonstrates these relationships. It would be pure chance that an arbitrary allocation would promote an efficient allocation of common costs.

### 5.1.2. Implications for Analysis

Bearing these arguments in mind, this analysis focusses on the direct costs of cremation and cremation services and an allocation of common costs. In general, we have followed the allocations provided by each Cemetery Trust as their best allocation of these common costs. However, the model developed allows for the common costs to be adjusted to incorporate greater or smaller allocations.

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<sup>14</sup> For example if an abattoir produces meat and skins, both of these products are produced using common processes (in this case, these are joint products). If the skins market is more competitive than that for meat, a rational allocation would see more of the common costs recovered from meat sales than skin sales.

<sup>15</sup> Ramsey, F P (1927) "A Contribution to the Theory of Taxation" *Economic Journal*, Vol XXXVII, March, pp. 47-61.

<sup>16</sup> Elasticity of demand measures the relative change in demand to changes in prices.

<sup>17</sup> Alternative allocations include relative revenues and relative attributable costs. See Brown, S J and Sibley, D S (1986) *The Theory of Public Utility Pricing*, Cambridge for more discussion of allocation options and efficient pricing.

## 5.2. Overview of Crematoria Operations

We turn now to examine the components of crematoria operations that should be included in an analysis of viability of crematoria.

Cremation services operate as an integral part of overall cemetery operations. The model that has been developed recognises that Victorian crematoria operations must contribute toward the overall viability of the Trust. In most cases, the crematorium may be a major contributor to revenue.

The key elements of crematoria activity can be considered in terms of the cremation process and then all other aspects. While this theoretical dichotomy would allow a neat examination of the viability of cremation in the State, the approaches and indeed the data of the individual Trusts is not sufficiently detailed to allow this split.

As noted, cremation is one decision for the bereaved, but it impacts on a number of other decisions and services, some of which are supplied by cemetery trusts as part of the ‘full service model’ provided in Victoria. These complementary services must therefore also be included in a consideration of viability.

### 5.2.1. Cremating

From a practical point of view, the actual cremation requires a cremator (and associated transport and processing equipment) and a building in which to house it. In other States, the building has been described as a “shed”, with the consequent implied prejudice about “factory operations”. These are the necessary requirements to cremate but do not provide an added level of service for the bereaved. As noted, the Victorian model encompasses a ‘full service approach’.

### 5.2.2. Cremation chapel service

Crematoria in Victoria provide a full cremation chapel service – or at least the option to use such a service. In particular, all crematoria provide at least one chapel for a committal service for the bereaved. Historically these facilities had been small, as a large service would be held at a large facility away from the crematorium.

Crematoria may also provide rooms in which functions can be held immediately after the service as well as facilities for visiting clergymen, funeral directors and lounges for the bereaved.

Provision of cremation services also can generate other revenue for the Trusts. Interviews with crematoria operators and details from annual reports highlight the importance of memorialisation revenue, in particular.

## 5.3. Treatment of Different Cemetery Operations

While cremation services may be considered a separate physical or business operation undertaken by Trusts, the **actual** operations are often closely intertwined with overall cemetery operations. Further, there are a number of operations undertaken by a Cemetery Trust that are not directly related to cremation but are part of the Trust’s operations.



### 5.3.1. Activities closely related to cremation

The bereaved engages a funeral director to arrange the vast majority of services associated in the death care industry. These arrangements include:

- the decision to bury or cremate and where this occurs;
- the decision to hold one or more services and the location of these services; and
- the purchase of a casket for burial or cremation.

Where the decision is to cremate, a separate decision may be made regarding memorialisation.

The Cemetery Trust is engaged by the funeral director to undertake the cremation and any committal service. The demand for the committal service is part of the relationship with the funeral director. In addition, a Cemetery Trust may also provide memorialisation services. There are a number of choices available to the bereaved but there is a significant link between the location of memorialisation and the location of the cremation.

Therefore while memorialisation is separate from cremation, there is little doubt that providing cremation facilities results in memorialisation sales. In the case of committal services, the link appears to be even stronger.

A narrow economic model of cremation viability would focus on the costs incurred and revenues gained solely attributable to the cremation process. However, this is likely to significantly understate the impact of undertaking cremations on returns for a Cemetery Trust. Consequently, chapel services and memorialisation are explicitly included in this analysis. In many cases, it is not possible to separate the costs associated with committal services as the chapel is part of the overall crematorium building and the staff engaged are part of the crematorium staff.

### 5.3.2. Maintenance of cemetery grounds

The vast majority of the area of a cemetery is associated with grave burials. This includes both previous and prospective areas. This is not to say that area is the determinant of cost, but it provides an indicator. It is particularly difficult to separate the aspects of these operations that represent a cemetery trust's perpetual maintenance obligation (PMO). The costs of the current PMO are not related to any future cremation activity (not indeed to any burials) though future cremation memorialisations will generate their own PMO. While these PMO costs are not related to cremation activity, each Cemetery Trust must be able to meet these obligations from its future revenue. The PMO is a cost of doing cremation (cemetery) business in Victoria.

Indeed from a narrow point of view, cremation is not dependent on the significant proportion of costs associated with maintenance of a cemetery's grounds, except for access roads and the surrounds. Were chapel services to be excluded, then a further proportion of maintenance would not be included. Indeed under a 'pure' standalone definition there would be no contribution to this from crematoria.

No cemetery trust was able to provide estimates of the separate costs of maintaining the cremated remains sections of its cemetery. Indeed, there is little data specifying the nature and magnitude of the PMO in each cemetery. Some trusts were able to provide information on maintenance associated with their crematoria and chapels.

For these reasons, unless grounds operations can be explicitly identified as specific to the crematorium or chapels, or contributing to the cremation process or the development of cremated remains memorial areas, general grounds costs are not included. For example, Springvale has the most sophisticated breakdown. They are able to identify the proportion of the costs of maintaining access roads attributable to the crematorium and separated the immediate costs for maintaining the surrounds of its crematorium and chapels.

In effect, all on-going maintenance is treated as a part of the PMO, whether from burial or memorialisation after cremation.

### 5.3.3. Administration and other overheads

A significant component of Cemetery Trust operations comprise administration.

There are generally no explicit measures of the costs imposed on administration from cremation (and the complementary services of memorialisation and chapel services). As a result we have been guided by the Trusts on the allocation of administrative costs to cremation.

There appears to be two allocation methods used.

1. A number of trusts have allocated administrative costs on the basis of relative throughput which results in a large contribution from cremations as for these cemeteries, cremations represent towards three-quarters of disposals.
2. A number of trusts have allocated very small amounts of administrative costs to cremation. These appear to represent the incremental costs from undertaking cremation activities.

### 5.3.4. Committal of non-cremated remains

Where identifiable, the operations associated with burial of non-cremated human remains in graves (or committal to mausolea) are not included in the analysis. These include:

- mausolea construction and maintenance;
- grave digging;
- memorialisation associated with these grave sites; and
- revenues associated with these activities.

## 5.4. Detail of Operations, Costs and Revenues

We now review in more detail the components included in the model of crematorium viability.

### 5.4.1. Operating parameters

The nine crematoria that operate across Victoria represent a range of scales of operations. The number of cremations undertaken varies significantly across the crematoria. The ability to meet this throughput could be achieved through variations to a number of operating approaches, in particular changing the:

- number of furnaces;

- expected throughput per shift by using different capacity furnaces; and
- length of usual working shift (and the timing and days worked).

Interestingly, across Victoria there appears to be little variation in the capacity of the furnaces nor the working hours. Increasing scale is achieved through increasing the number of furnaces.

These decisions can impact on other indicators of scale:

- the number of staff employed at the crematorium; and
- the size of the buildings used.

#### 5.4.2. Costs

Costs are included in a number of broad groups. There are two elements of capital costs (start-up and refurbishment) and two groups of operating (cremation-related and overheads).

First, there are a set of start-up capital costs basically comprising building (including any chapel) and equipment costs. A new building would not be expected to be replaced in the time frame but established chapels and crematorium buildings may do. In addition, these buildings incur annual maintenance costs. For a new crematorium, the major equipment cost will be the installation of the new furnace(s).

Second are major refurbishments associated with the furnaces. There are three levels of capital expenditure: rehearting, a full rebrick and full replacement.

Third, there are operating costs associated with cremations. These comprise fuel costs, wages and specific cremation related administrative costs.

Finally there will be an allocation of (fixed) common costs or overheads. These costs incurred by the operator may be associated with or allocated to the crematoria. These include allocations of administrative / managerial time, cleaning costs and the maintenance costs not covered above.

#### Operating

As noted above, operating costs are of two types:

- costs that are associated with cremations;
- fixed costs, including overheads.

The first includes variable costs reflect primarily the power costs from cremation: gas and electricity. In addition, there may be (significant) reporting and recording costs associated with a cremation.

In addition there may be variable costs associated with providing chapel services and memorialisation. In many cases these separate variable costs are not identified by each trust. However, memorial costs, such as for plaques, may be separately estimated.

The remaining costs have been considered fixed with respect to changes in throughput. The major fixed costs for cremation have been aggregated into:

- wage and on-costs from the crematorium. The number of staff employed and their reported costs do not vary with the number of cremations, except where there may be overtime incurred;
- allocated administrative costs which include auditing, administration costs, management costs, general cemetery maintenance and repairs (such as to access roads and surrounds);
- general capital annuity. Rather than separately include all other capital items, an annuity can be used to represent other equipment replacement costs, such as for vehicles and computer equipment.

## Capital

Capital items comprise equipment and buildings. There are a number of major equipment items associated with cremation, comprising:

- cremator unit(s) (or furnaces);
- a processor (for reducing remains into ash);
- at least one scissor trolley for moving coffins between the chapel and crematorium and possibly a dedicated charging bier. The charging bier may include mechanisms to reduce wear and tear on bricks;
- pans for collection.

In addition, the cremation service may require significant other equipment including:

- cool room for storage of corpses;
- drying machine (e.g., for ashes that have been placed for display purposes in a temporary memorial);
- vehicles for staff movements; and
- trolley hoists and gantries associated with memorialisation.

Apart from the cremation unit itself and the processor, none are strictly necessary in the sense that different crematoria may or may not have separately purchased or built the other items. In particular, standard trolleys used to move coffins have been used instead of charging biers.

All of these items will undergo maintenance and possibly replacement.

However, cremator furnaces require significant refurbishment through their life:

- First, the hearth may be partially or completely relined/rehearthed with new bricks. Furnace suppliers undertake regular maintenance of the furnaces. At these times, they are able to determine if the furnaces require relining or more substantial repairs due to brick damage when the cremator is charged. Rehearthed involves replacing chipped or damaged bricks, typically on the floor of the cremator.
- Second after a number of rehearths, all of the bricks inside the cremator will need to be replaced. During such major maintenance, the cremator may be upgraded.
- Finally, the cremator unit may be completely replaced. It is not clear that there is a set rate for this decision. In the case of one Trust, the original (1958) cremator (and processor) is still in use.

A major capital cost is the cost of the buildings that house the cremator. Most cremators are located in purpose-built structures which may also include a chapel and associated rooms. The building requirements include significant equipment such as air conditioning, monitoring and air outtakes. In addition to an optional cool room, crematoria require areas for storage of ashes, memorialisation products and equipment, and various other equipment.

The chapel may be an integral part of the crematorium or it can be separately located (which may require vehicles to transport the coffin). Within the chapel, there will be a catafalque (a machine for lowering the coffin to enable it to be taken out of the chapel area) and often substantial audio-visual equipment for use during the service. In addition, the building may include clergy rooms, antechambers and rooms for reflection. There are usually attached gardens.

### 5.4.3. Revenue

1. The primary revenue from cremation is the cremation fees. Most operators charge a wide range of fees reflecting alternative service packages. These relativities reflect adult versus child cremation, the timing of the cremation, whether pre-paid and method of return.
2. In addition, Trusts set higher prices for cremations that include a service. The use of the chapel typically has a time limit.
3. The third key revenue source is from memorialisation fees. While nearly all cemeteries can inter ashes, the rate of interment is substantially increased where the cemetery has a crematorium.

For memorials, the level of the charges is limited effectively only by the range of memorials available including: wall niches with vases; wall niches above a certain level; rose gardens; premium rose gardens; family rose gardens; location in rose garden; books of remembrance; rock pools; etc.

## 5.5. Implications

The major elements derived above are used to define the financial model developed in the following chapter. Chapter 6 provides details of the sources of data used and inputs from the crematoria.

## 6. Modelling Parameters & Comparisons with Other Jurisdictions

This chapter develops the structure outlined in Chapter 5 to construct a cashflow model for the Victorian industry. Sections 6.1 to 6.5 outline the economic model and data inputs and outputs. These provide an indication of the likely costs that an entrant may face (or indeed a generic incumbent) in Victoria.

Section 6.6 presents information from other jurisdictions that allows comparisons with the approaches used by Victorian crematoria..

As with any model and quantitative analysis, there will be concerns regarding the availability and quality of relevant data. These are made in the “Limitations” chapter at Section 12.4.

### 6.1. Outline of the Economic Model

We have developed a cashflow spreadsheet model to simulate the viability of the Victorian cremation industry and of each crematorium. A cashflow model shows the actual expenditures expected in each year over the modelled period. It will therefore not include items such as depreciation. In addition, costs and revenues are set out as excluding GST.

The model has been dimensioned to the ‘economic long run’. The economic long run is defined as the period of time over which all input variables are able to be varied. In practice, this is determined by the replacement timing of the major capital items for a business. In the case of crematoria, it was judged that the major capital items were the furnaces. There appears to be some variability with respect to their economic life, but a period of 50 years allows for at least one replacement. The other major capital items are the buildings that house the furnace(s) and the chapel(s). The expected economic lives of these items can vary significantly. However, it was considered that 50 years was again sufficient to incorporate any replacement for these items.

Unless otherwise stated, costs and revenues are modelled to increase at inflation rate. Each year’s inflation rate may be adjusted by the user as can the rates of change for some prices.

### 6.2. Output

The model enables investigation of expected viability under alternative assumptions on costs, revenues, operating parameters and entry of other crematoria. While each crematorium differs from others in the State, the spreadsheet for each crematorium is set out identically because of the focus on comparison and industry performance.

The model addresses the key questions developed in the decision framework:

- Does the crematorium generate greater returns than would be obtained by investing its money in alternatives?
- Is the crematorium financially viable?

The model combines all crematoria (both existing and proposed) to establish the impact of entry on the returns to the industry as well as each crematoria.

## 6.3. Model Inputs

The operating parameters are derived from the year that forms the basis of the financial input data. For most crematoria, this will be 2003 – reflecting the most recent trust accounts and in some cases separate analysis of the crematorium operation. However in the case of Springvale, the trust undertook detailed analyses over a number of years of the cost components for cremation and provided greater information on allocation of overhead costs. The most recent data was available from 1998 (though they made estimates of expected costs in 1999). These parameters form the basis of Springvale’s inputs.

### 6.3.1. Demand

All inputs into the model may be varied to allow sensitivity tests<sup>18</sup> to be undertaken. For each crematorium, however, the major sensitivity considered is the *impact of changes in demand*. The number of cremations undertaken determines the revenue obtained by the trust, the pattern of major maintenance and some operating costs. These costs in particular are somewhat sensitive to the pattern of cremation demand. Importantly, costs will be minimised where cremations can be undertaken with continuous processing. Rebricking costs increase where furnaces go through more heating and cooling cycles.

The model uses annual cremation throughput figures. The use of annual figures smoothes the peaks and troughs associated with within-year variations in deaths appropriate to this long-term analysis. Outside of seasonal and week-end effects, we would expect demand to be random during the year.

Where the pattern of cremation demand through the year changes (and the crematorium does not have the capacity or policy to distribute cremations to provide more continuous processing), this is likely to affect the operating costs of the crematorium. For the purposes of this model, we have assumed that there will be no marked change in the **pattern** of cremation demand that would have a material impact on the average cost of cremation.

For each crematorium, the Trusts have estimated the proportion of cremations that also use the crematorium’s chapel and those that use the cemetery’s memorialisation services for recent years. These rates provide the starting point for expected number of services and memorials.

### 6.3.2. Operating parameters

The model incorporates the major elements identified above:

- number of cremators;
- daily (shift) capacity;
- number of daily shifts; and
- base year<sup>19</sup> information on cremations, chapel services and memorialisation.

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<sup>18</sup> That is, the systematic variation of a variable to determine its relationship to key outputs.

<sup>19</sup> Note, the year for inputs for analysis may differ from the base year (2003).

### 6.3.3. Costs

The information provided by Cemetery Trusts allows estimates to be made of the cost of cremation (including the cost of conducting chapel services for a number of these) across the nine crematoria. We discuss below the estimates of the major groups of costs: operating, including power, labour and cremator-related costs; and fixed including building costs, other capital costs and allocations of overheads.

#### Power costs

Power for the crematorium is comprised of two components – gas and electricity. Some power costs are constant, irrespective of throughput (particularly some electricity costs) much of the costs are directly proportional to throughput.

Operational information indicates that the operation of a furnace requires pre-heating at the beginning of any day that the furnace is to be used. This operating pre-requisite is likely to be of the order of an hour, but is significantly higher after periods of non-use, such as after the weekend.

Energy in the form of heat steadily builds up with continuous use, steadily decreasing the amount of input power required. At the end of a period of continuous use, much less power is required. The furnace will enable combustion from the heat already generated and from the fuel provided by the coffin.

It is not possible to model the daily consumption patterns for each crematorium for these factors. It has been assumed that the pattern of cremations will continue for the forecast period and therefore not impact on the average usage per cremation.

To the extent that throughput increases, the recorded average cost is likely to decline. We do not, however, estimate or simulate this decline.

All Trusts were able to provide information on their **power** costs attributable to cremation. In all cases this includes power costs for chapels and related services. However, not all trusts separated these costs into gas and electricity – for example, Fawkner lists solely power costs. Gas usage will primarily comprise that used to pre-heat the furnaces (for say an hour) prior to the first cremation of a day and the amount used during cremation. For each subsequent cremation in day, the average amount per cremation will decline. Indeed with continuous operation, cremations at the end of a day may be performed using the heat from earlier cremations and fueled by themselves.

Unless the pattern of cremation demand changes for any crematorium or there is a significant increase in throughput, the average power cost per cremation is unlikely to vary significantly. For the purposes of this analysis, we have assumed that per cremation power costs remain constant in real terms.



## Labour costs

Analysis of the accounts for Victorian crematoria indicates that the key elements of the cost of cremation services are the labour costs. The staff employed in the crematoria are used for cremations and for chapel services. For most crematoria, the number of staff engaged in solely cremation activities does not exceed two across the range of furnace numbers and throughput.<sup>20</sup> With automated furnaces and staggered starts, one operator can oversee a number of concurrent cremations. Indeed, for the actual act of cremation, only one operator is needed and Trust comments suggested that the operator only needed to be at the cremator for a few minutes at the start and end of the approximate one hour process. However, related operations such as ash processing and documentation requires additional resources.

**Table 15 – Determinants of Staff Numbers – 2003**

	Cremation – staff + supervisors	Furnaces	Throughput	Utilisation (cremations/staff)
Bendigo	1	1	446	446
Traralgon <sup>1</sup>	1	1	565	565
Ballaarat	1	1	617	617
Geelong	1	2	933	467
Lilydale <sup>2</sup>	1	3	1,309	1,309
Bunurong	2	2	1,597	799
Altona <sup>3</sup>	1	2	1,729	1,729
Fawkner	1+1	4	2,400	1,200
Springvale	3+1	5	6,425	1,606

1 Traralgon does not separately employ a crematorium operator. It is one of the manager's duties.

2 Lilydale's three furnaces each have a lower daily capacity (5). The three furnaces have a capacity only slightly higher than crematoria with two furnaces (and a daily capacity of 7 per furnace).

3 Altona's operator is occasionally assisted by the chapel attendant.

At the regional crematoria especially, staff are described as sharing their time between cremation activities and other duties, such as gardening, producing memorials and, in the case of Traralgon, managing the Trust.

For larger crematoria, the number of staff required does not appear to be strictly linearly related to number of furnaces. As a result, we have not tied staff numbers nor wage costs to throughput nor furnace numbers. We have included a diagnostic that shows the ratio of cremations to staff and the capability to increase manually cremation staff numbers. From inspection of the above, a new staff member may be required when utilisation exceeds 1,700 cremations/staff member per annum. Alternatively, wages costs may be linked directly to cremation numbers.

In addition to furnace operators and supervisors, crematoria also may employ staff associated with chapel services and memorialisation sales and production. For smaller operations, this is likely to be undertaken by one person. In the case of the largest crematorium, Springvale, most of the staff allocated to the crematorium are associated with chapel or funeral services. Where possible, these staff are included under costs associated with chapel services however in some cases they have not been separately identified.

<sup>20</sup> Typically, there will be at least one other back-up staff member who is qualified to operate the furnaces. They will be used when the main operator is on leave.

The labour costs shown represent both ordinary time earnings and overtime. The amount of overtime will reflect the need to undertake more than seven cremations per furnace in a day. We would expect higher rates of overtime where there is a same day service policy (no cool room). However, this overtime cost may be mitigated where working arrangements use flexible hours, as in the case with Springvale. In fact, Springvale, which reported the highest utilisation rates also reported that they hadn't paid any overtime, making use of flexitime to juggle working hours. The actual data provided by the Trusts includes any overtime for the base year. As with our treatment of throughput, the working assumption is that the pattern of use does not vary through time and therefore there is no impact on the need for overtime. That is the proportion of overtime remains constant.

As a sensitivity, we have included the ability to allow higher wages costs from overtime payments where the daily throughput exceeds a user input value (with further rises if double time is triggered). The experience of Springvale suggests that with flexible scheduling and a cool room, much of the need for overtime can be avoided.

Interestingly, a number of crematoria noted that they were adverse to having their operators work at night in a cemetery. This appears to be due to a number of factors:

- undesirability of job at night;
- council regulations; and
- consideration of local residents/public relation factors.

Where possible cremations are undertaken during normal working hours.

For each crematorium, the number of staff and their total on-costs are used as per each Trust's estimates.

### Other variable

In addition, Springvale identified a range of consumables and direct inputs relating to cremation. These include items such as cremated remains containers, printed information provided to cremation organiser, cremation cards, mail expenses, reporting and computer costs associated with bookings, certificates, mailings, invoices and reports. Almost half of these costs relate to the IT support specifically for cremations. We would expect similar costs for other crematoria and assume these are included within their administration costs.

### Furnace costs

There are a number of furnace suppliers around the world who provide a wide range of options in terms of speed, pollution controls and automation. In Victoria, furnace supply is dominated by two brands<sup>21</sup> – Major, supplied by Major Engineering, and Newton, supplied by Austeng. Most of these furnaces are able to undertake seven cremations during a standard working shift.<sup>22</sup>

Furnaces can be defined in terms of their operating parameters:

- average time per cremation – which generates the daily throughput per shift;

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<sup>21</sup> In addition, Traralgon uses a Parsons Tabo from Adelaide.

<sup>22</sup> The Parsons Tabo can cremate six in a shift and each Major furnace at Lilydale can do five.

- high versus low volume furnaces – the former able to undertake longer continuous operations than the latter;
- combustion temperatures (and therefore efficiency of process); and
- emission monitoring and pollution controls.

The major difference identified across Victorian crematoria furnaces is the daily capacity. The other elements were either not highlighted by the crematoria, or not significantly different. Purchase costs vary somewhat in current price terms across the crematoria.<sup>23</sup> The costs range from around \$215,000 to \$300,000 except for Bendigo.<sup>24</sup>

**Table 16 – Comparison of Cremation Furnaces**

	<i>2003 indexed cost per furnace (\$'000)</i>	<i>Standard cremation time</i>	<i>Daily capacity</i>	<i>Utilisation<sup>1</sup></i>
Springvale	\$241.8	1:15	7	73%
Altona	\$259.1	1:25	7	49%
Bunurong	\$299.6	1:15	7	45%
Traralgon	\$280.	1:50	6	37%
Ballaarat	\$235.0	7/8 per day	7	35%
Lilydale	\$302.6	1:10	5	35%
Fawkner	\$250.0	1:15	7	34%
Geelong	\$217.9	1:20	7	26%
Bendigo	\$404.7	1:30	7	25%

<sup>1</sup> Defined as 2003 throughput divided by (number of furnaces times daily capacity times typical number of days in a working year)

Furnaces require significant on-going maintenance. The major maintenance cost is from the regular rebricking of the furnace. The trusts provided information on their experience with the three types of costs outlined above – rehearthing, rebricking and replacement costs.

The cremation process places significant wear and tear on the furnace bricks. The hearth can require relining after some 1,500 cremations. The furnace may need re-bricking after two or three hearth replacements and the total furnace may be replaced after two or three re-bricks.

These figures represent indicative numbers and considerable variation in expectations was reported. The actual timing of these major maintenance reflect the actual wear and tear on the bricks and appears difficult to predict, or at least has not been done consistently across Victoria. This creates difficulties in benchmarking this key input. Factors that affect this are:

- Continuity of activity. Bricks are likely to break the more often they heat and cool. We would therefore expect
  - Lower volume operations to require more re-bricking than larger;
  - Similarly, operation with a cool room and a policy of NOT necessarily cremating on the same day, would be able to regulate use to reduce this wear and tear;
- Operations that undertake more “no service” cremations are better able to regulate usage (due to time-tabling of committal services); and

<sup>23</sup> Note that these costs are the installed costs reported by the trusts inflated by the CPI.

<sup>24</sup> These may not be the trusts’ expectations for future replacement costs. In fact, Traralgon has budgeted \$750,000 when it replaces its Parsons Tabo in 2011. This seems excessive and has not been used as the replacement cost. This budgeted figure may include some building alterations at that time.

- Anecdotal (and sales claim) evidence suggests that the latest charging biers that reduce the impact of coffins on the hearth thereby reducing chipping which reduces re-bricking costs.

There appears, however, to be some conflation between replacement of furnaces and the periodic re-bricking. Some crematoria noted that they never replace – the furnaces are regularly maintained and upgraded. Others noted that the furnaces are replaced or were expected to be replaced after 15-20 years. Further, some Trusts did not list a rehearth cost. These costs may be reflected in their estimate of annual furnace maintenance costs.

As the key driver of maintenance rebricking was identified by the trusts as throughput, we have transformed the Trusts' estimates of maintenance timing to this format where not undertaken by themselves.

**Table 17 – Major Furnace Maintenance Costs**

	<i>Rehearth cost (\$'000)</i>	<i>Number of cremations per rehearth</i>	<i>Rebrick cost (\$'000)</i>	<i>Number of cremations per rebrick</i>	<i>Replacement cost (\$'000)</i>	<i>Number of cremations per replacement</i>	<i>Cremator maintenance (\$'000)</i>
Altona	<i>nr</i>	<i>nr</i>	\$38.0	5,000	\$259.1	15,000	\$28.6
Bunurong	<i>nr</i>	<i>nr</i>	\$34.0	7,000	\$299.6	21,000	\$2.2
Fawkner	\$20.0	1,500	\$40.0	4,500	\$250.0	18,000	\$40.0
Lilydale	\$14.1	2,000	\$52.9	4,000	\$302.6	12,000	\$24.8
Springvale	\$6.1	2,000	\$38.7	6,000	\$241.8	18,000	\$32.5
Ballaarat	\$7.5	3,000	\$45.0	6,000	\$235.0	18,000	\$3.3
Bendigo	<i>nr</i>	<i>nr</i>	\$98.4	3,500	\$404.7	10,500	\$10.4
Geelong	<i>nr</i>	<i>nr</i>	\$50.0	5,000	\$217.9	15,000	\$20.9
Traralgon	<i>nr</i>	<i>nr</i>	\$95.7	6,000	\$280.0	12,000	<i>nr</i>

*nr* Not reported. In these cases, relining is likely to be incorporated within overall cremator maintenance or (in the case of Traralgon), in rebrick costs.

For the purposes of comparability, it is possible to combine these costs into an annuity. The cremator-related annuity is shown with other capital costs in Table 17.

## Buildings

The largest capital item associated with cremation is the crematorium building. While these are long-lived assets it is important that the analysis includes the ability to replace these assets. It is not clear that cemeteries actually replace these buildings (and chapels), but undertake significant annual maintenance that ensures that the economic life of the buildings is extended.

The default input is to include the cost of the buildings as their replacement costs. It is likely, however, that these buildings will require more sophisticated electronics – both crematorium and chapels – as community expectations are raised. Therefore more modern chapels will be expected to have modern sound and video systems and crematorium buildings improved pollution control, comfort and safety features.

Table 18 shows the implied annuities associated with the rebricking, replacement and maintenance costs for each crematorium.

**Table 18 – Capital Annuity (\$'000)**

	<i>Altona</i>	<i>Bunurong</i>	<i>Fawkner</i>	<i>Geelong</i>	<i>Lilydale</i>	<i>Springvale</i>	<i>Ballaarat</i>	<i>Bendigo</i>	<i>Traralgon</i>
Cremator annuity	\$107.6	\$29.6	\$237.5	\$61.5	\$115.7	\$154.6	\$12.2	\$41.0	\$18.6
Crematorium annuity	\$31.6	\$5.7	\$42.4	\$21.1	\$1.2	\$32.1	\$8.4	\$8.8	\$17.0
Chapel annuity	\$7.2		\$34.8			\$1,021.4			\$6.4
Other capital annuity	\$4.4					\$17.5			\$3.6
<b>Capital annuity</b>	<b>\$150.7</b>	<b>\$35.3</b>	<b>\$314.6</b>	<b>\$82.6</b>	<b>\$117.0</b>	<b>\$1,225.6</b>	<b>\$20.6</b>	<b>\$49.9</b>	<b>\$45.6</b>

There is a wide range of costs identified above. In particular, a number of trusts do not incur a separate chapel annuity because the chapel is part of the crematorium. Second, the cashflow approach identifies future obligations. In this respect, recent building constructions, as has occurred at Bunurong and Ballaarat, will not incur significant future expenditure until the end of the modelled period. This is not to say that these expenditures are ignored. They are incorporated within the analysis as the written down replacement cost at the first year. Table 19 shows these values and its implied annuity within the model.

**Table 19 – Written Down Replacement Cost and Implied Annuity (\$'000)**

	<i>Altona</i>	<i>Bunurong</i>	<i>Fawkner</i>	<i>Geelong</i>	<i>Lilydale</i>	<i>Springvale</i>	<i>Ballaarat</i>	<i>Bendigo</i>	<i>Traralgon</i>
WDRC	\$2,549.0	\$1,977.0	\$3,469.0	\$1,700.0	\$773.0	\$10,661.0	\$907.0	\$1,026.0	\$279.0
Annuity	\$160.4	\$124.4	\$218.3	\$107.0	\$48.6	\$670.7	\$57.1	\$64.5	\$17.6

## Overheads

Most other costs can be classified as overheads. For most crematoria, these have been allocated as indicated by the Trust. It is not clear that these costs have been allocated across all operations – burial, cremation, services, memorials, mausolea – or between the two primary disposal methods – burial and cremation.

Theory is agnostic on whether all activities are attributed these costs. However, given the allocation methodology used is predominantly based on activity, it may be appropriate to consider that some of these allocated costs could be met by revenue from chapel services and memorials, and indeed mausolea charges.

The model includes estimates of fixed costs. To allow flexibility in analysis, the drivers of these may be varied by the user. Therefore elements of 'fixed' cost may be allowed to vary with:

- number of cremations;
- number of cremators;
- number of chapel services;
- number of memorials; or
- number of cremation staff.

#### 6.3.4. Possible major variations

There appears to be a number of potential foreseeable, albeit not predictable, ‘shocks’ that can affect these estimates. In particular, there is a significant possibility that the emissions standards and monitoring for Victorian crematoria may rise. Under these circumstances, Trusts expect the purchase cost of furnaces and buildings to increase significantly.

Further, there is little training required to operate a furnace. Consequently, we do not envisage a significant change in average wages for operators which seems unlikely (unless the technical requirements of the furnace substantially change). The major foreseeable change in furnaces is increased monitoring and emission controls. These may result in increased training and therefore require higher real wages.

Offsetting these shocks is the likelihood of technological improvements that reduce maintenance costs or provide greater potential for value-adding for the trusts. These two impacts would work to improve viability over time.

### 6.4. Summary of Indicative Costs and Revenues, and the Generic Crematorium

#### 6.4.1. Indicative costs

Table 20 summarises the major cost parameters for crematoria in Victoria. These provide the key inputs for economic/financial modelling (refer Chapter 7). While the model is cash flow, we have included an annuity for capital items to provide an indication of the implied annual costs for these items. These annuities were estimated using the lower discount rate. There is significant variation in a number of these capital annuities (and the charge against the Written Down Replacement Cost). Much of the differences reflect the timing of recent upgrades and the size and number of the buildings used.

In reviewing the range of estimates, it is important to recognise that for much of the operations of the crematoria, there are significant economies of utilisation (as well as economies of scale in establishing the dimensions of a facility).

Power costs vary between \$15 and \$56 per cremation. These include gas and electricity costs for both the furnaces and the buildings. The outlier, Traralgon uses bottled gas, which in a regional market, appears to add significantly to its costs. Geelong, which also uses bottled gas, also records high average costs.

Only Springvale records significant other variable costs. It is likely that all other crematoria incur these costs but have not estimated them on a unit basis. These costs would be therefore subsumed within administrative costs, if at all.

Wages costs per cremation reflect the number of staff allocated to the business line and the number of cremations undertaken. As noted, the use of multi-tasking blurs these costs particularly for regional operators. Where capacity utilisation (or alternatively number of cremations per operator) is low, staff are likely to be used for other tasks.

**Table 20 – Major parameters of crematoria**

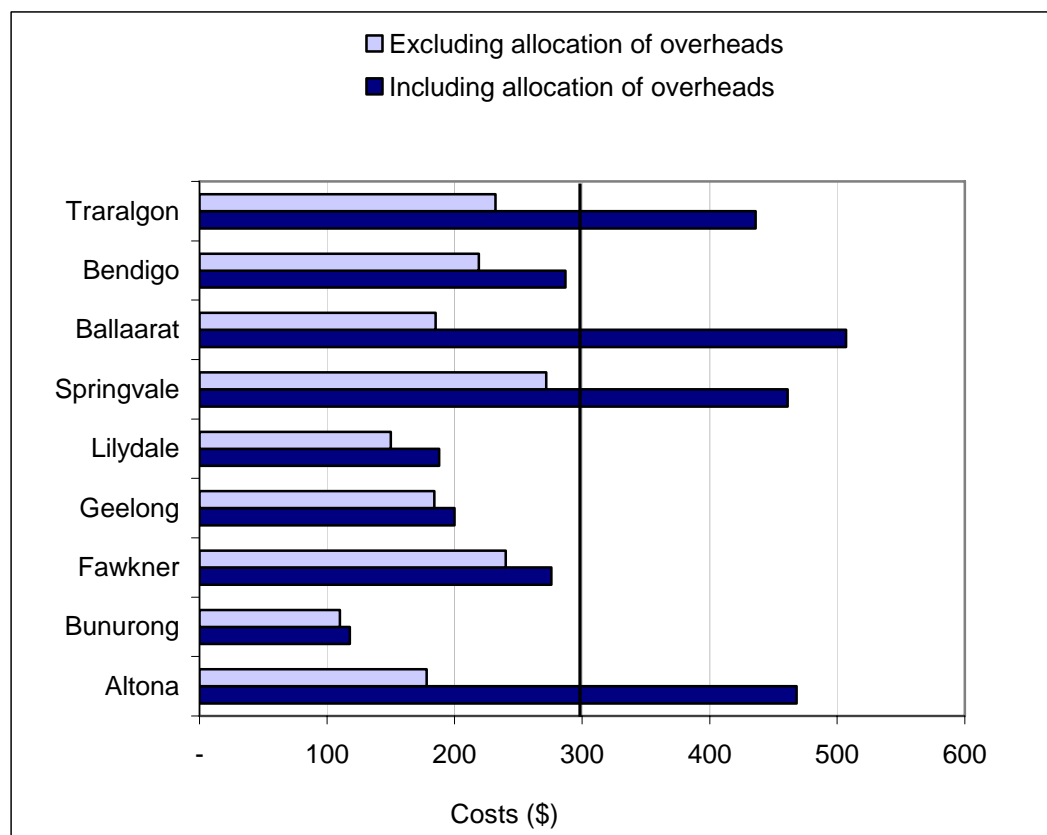
	Altona	Bunurong	Fawkner	Geelong	Lilydale	Springvale	Ballaarat	Bendigo	Traralgon
<b>Number of cremations (2003)</b>	1,729	1,597	2,400	933	1,309	6,425	617	446	565
<b>Variable costs per cremation (\$)</b>									
Power	13	19	18	25	23	14	22	15	56
Other variable	-	4	7	-	-	34	-	3	-
<b>Fixed costs per cremation (\$)</b>									
Wages	78	65	84	70	38	33	130	90	95
Cremator annuity	62	19	99	66	88	24	20	92	33
Crematorium annuity	18	4	18	23	1	5	14	20	30
Chapel annuity	4	-	14	-	-	159	-	-	11
Other capital annuity	3	-	-	-	-	3	-	-	6
Overheads	290	8	35	16	38	190	322	67	205
<b>Average cost per cremation (\$)</b>	<b>468</b>	<b>118</b>	<b>276</b>	<b>200</b>	<b>188</b>	<b>461</b>	<b>507</b>	<b>287</b>	<b>436</b>
<b>WDRC per cremation (\$)</b>	93	78	91	115	37	104	93	145	31
<b>Average cost per cremation (\$), less allocated overheads</b>	<b>178</b>	<b>110</b>	<b>240</b>	<b>184</b>	<b>150</b>	<b>272</b>	<b>185</b>	<b>219</b>	<b>232</b>

All of these facilities established (or replaced) their major capital items prior to 2003. As a result, the annuities for these capital items will be less than if the items were replaced in 2003. To take account of this, we have included an amount to recover the written down replacement cost to indicate the need to recover these earlier incurred costs. In the case of Bendigo, this is a notional cost as the replacement was associated with its furnace explosion and replacement.

As noted above, trusts have significantly different allocations of (administrative) overheads, from minimal in the case of Bunurong and Geelong to around three-quarters for Springvale. The final line of figures shows the result if we do not allocate any overhead (note that chapel costs are still included).

The costs per cremation are summarised in Figure 11.

Figure 11 – Average costs per cremation



This chart suggests that cremation charges (including some proportion with a chapel service surcharge) of the order of \$300 could be sustainable in the short term. That is, the revenues would cover the direct costs of cremation, but not make a contribution overheads, profits or repaying previous investments.

A possible exception to this is Springvale. However, much of this is driven by the need to fund significant replacement of its three chapels. There may however be scope to achieve some economies in the replacement of these buildings and infrastructure.

While this analysis suggest that cremation charges may be sustainable at around \$300 in the short run, it is to be remembered that these figures do not include the effectively windfall gains that trusts obtain through the sales of memorials.

### Memorials

Like much economic activity, the provision of cremation services does not operate in a vacuum. Cremation is only one of a range of choices that the bereaved must make associated with the death of a loved one.

The brief for this analysis focusses on the viability of cremation. However, it would be inappropriate to consider the effect of providing a cremation facility for a Cemetery Trust solely in terms of cremation. This is particularly relevant as the trusts themselves have noted that they receive a significant amount of revenue from memorial sales.



As noted above, a significant proportion of cremations result in a memorial sale and the revenue from these sales appears to significantly exceed their direct costs. While there are significant establishment costs for the memorials, there are no estimates of the on-going costs of maintaining the memorials. For the purposes of this analysis, this on-going cost is considered as part of the PMO that is to be funded from total cemetery returns. (To allow analysis of a 'factory' cremator, memorialisation revenues and costs can be excluded.)

The costs (and revenues) associated with memorialisation vary according to the amount of value adding by the cemetery. As an approximation, memorialisation costs are set at a fixed proportion of memorialisation revenue.

### Perpetual Maintenance Obligation

The funding of cemetery maintenance is also an issue in the UK. A recent report noted

*It is perhaps interesting to note that some of the highest standards of burial ground maintenance are those seen in Commonwealth War Graves Commission cemeteries; most of which are overseas but there are a few in England, e.g. at Cambridge. The CWGC has maintenance as its central task and is funded by six Commonwealth Governments to do just that. The key to the high standards they achieve is the continuous and adequate levels of funding they enjoy.<sup>25</sup>*

In 2002-03, the cost to the Australian government of graves maintained by CWGC was \$17 per grave.<sup>26</sup> In 1991, the ACT government provided its Trust with approximately \$17 per grave as a one-off CSO to provide for perpetual maintenance of existing graves.<sup>27</sup> This is the equivalent of \$22.40 in 2003 dollars.

These costs are provided for information and are not part of the modelled industry.

### 6.4.2. Charges and revenues

Table 21 shows an indicative rate for cremation with no service deliveries (NSD) which represents the cheapest adult rate (excluding pre-arrangement).

By way of comparison, the table also lists the average cremation revenue earned by the crematorium in the base year. NSD cremations are more common for metropolitan crematoria than for regional.

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<sup>25</sup> Wilson and Robson (2004) p. 59

<sup>26</sup> Department of Veterans' Affairs (2003) *Annual Report 2002-03*, Output 3.2 Office of Australian War Graves, p. 110

<sup>27</sup> CIE (1998) p. 18.

**Table 21 – Indicative cremation charges and average revenue from cremations**

	Altona	Bunurong	Fawkner	Geelong	Lilydale	Springvale	Ballaarat	Bendigo	Traralgon	Average
<b>Adult cremation rate - no service (\$)</b>	620	730 [1]	660	660	624	640	682 [2]	632 [3]	574	<b>630</b>
<b>Average cremation revenue per cremation (\$)</b>	564	494	568	633	475	528	637	611	635 [4]	<b>564</b>
<b>Ratio of Average to Indicative (%)</b>	91	68	86	96	76	82	93	97	111	<b>89</b>

- 1 Bunurong's price list does not include a no service rate. The charge shown includes a service. The pre-need charge is \$630. The ratio for this measure is 78%.
- 2 This rate is for deliveries before 10am.
- 3 This rate is for deliveries before 11:30am.
- 4 Traralgon average revenue includes chapel service charges.

## 6.5. Notes on Victorian Crematoria

### Altona

The Altona facility commenced operations in 1960 with two oil fired Major cremators. They currently operate two Newton cremator units which were purchased in 1991. The cremators typically operate five days a week during normal working hours, but may be used at other times depending on demand. Altona uses one operator, with an assistant for chapel services, catering coordination and with packing and despatch.

Altona has two chapels, though only one typically is used for services; the other being available for after service functions. As is common with most crematoria, the chapel is part of the crematorium.

Altona also undertakes cremations of remains from universities.

Average revenue from cremations is around \$550 (which reflects in part discounted university work). Altona do not keep separate records of the memorialisation of cremated remains, but expect that they memorialise around 20%. They note that they do not approach families selling memorials.

### Bunurong

The Bunurong crematorium began operations in 1996 and operates two Major cremators. Bunurong have two operators, principally for charging of the furnace. The cremators are operated on a standard eight hour day for five days a week. Overtime may be necessary where demand is high.

Bunurong were able to provide separate returns for cremation activities and services. As a result, average revenue from cremations is very low (under \$450) when compared with other crematoria, but equally average revenue from services is high (over \$150).

## Fawkner

Fawkner began operations in 1926. It currently operates four Newton cremators which were purchased in 1980. The original crematorium was replaced in the 1970s. Fawkner has three chapels built progressively since it began operations. It currently expects to build a new (double) chapel to meet demand for larger committal services.

Fawkner uses one operator with a supervisor for the crematorium.

Average revenue in Fawkner is slightly under \$600.

## Geelong

Geelong was established in 1987 and currently operates two Newton cremators. Because of location, Geelong uses LP gas and is unlikely to switch to town gas in the foreseeable future. The cremators are capable of five cremations per day with typically one cremator only in continuous use. During the Longford crisis, they undertook a peak of 29 cremations in one day and 94 in the week.

The chapel is part of the crematorium which received major extensions in 2002.

Average revenues in Geelong are above \$600 with average service charges around \$50. Geelong are aware that price may be limiting their competitiveness for regional funeral directors.

## Lilydale

Lilydale began operations in 1995 and currently operate 3 Major cremators. The cremators are operated by one person. Reflecting its low average usage, Lilydale's rebricking occurs more often than other larger crematoria. The cremators currently operate on an eight hour day. The peak number of cremations undertaken was 13 in one day (over 15 hours) and 45 in a week.

The crematorium and adjoining chapel were purpose built in 1995.

Average revenues in Lilydale are below average with cremation unit revenues below \$500 and service revenues around \$30.

## Springvale

The Springvale (Necropolis) crematorium began operations in 1936 and comprises a purpose built standalone crematorium and four chapels. The crematorium was rebuilt in the 1980s. This originally housed 10 cremators but Springvale currently operates five Major cremators with a capacity of seven cremations per day. Springvale includes a cool room that enables better scheduling of cremations to remove some peaks. Four of these cremators are connected to natural with the fifth (oversized) connected to bottled gas.

Springvale employs three operators and one supervisor. However, their tasks are not limited to cremations.

Average revenues at Springvale are slightly above \$500 for cremations.

## Ballaarat

Ballaarat began operations in 1958 and currently operates one Major cremator that replaced its predecessor that blew up in 2002. One operator is required to run the machine but he is also used on other duties including memorialisation. Further one person is employed full time at the crematorium for administration and sales. The building comprises both crematorium and chapel.

The cremator can cremate seven or eight bodies a day and is operated on a five day working week.

Average cremation revenue exceeds \$600 but this includes some element of charges for chapel services. During 2002, Ballaarat's cremations were undertaken by Bendigo. This does not appear to have affected the relative volume of cremations handled by Ballaarat as the extra costs were to be covered by insurance.

## Bendigo

Bendigo began operations in 1989. It currently operates one Newton cremator operated by one person (at any time). The cremator is expected to be able to undertake six cremations per day under their current operating procedures (but could handle 10). The crematorium also houses the chapel.

Average revenue from cremation is the lowest of the regional crematoria but above \$600 (similar to Ballaarat, it is not possible to identify separate chapel service revenues).

Bendigo has undertaken around 450 of its own cremations in recent years. It noted that it has lost 25% of its demand to Dareton and Moama.

## Traralgon

Traralgon began operations in 1985. It currently operates one Parsons Tabo cremator. The cremator is normally continuously run for 10 hours which represents five cremations. It is expected to handle six cremations per day or 30 per week. The cremators are usually run by the manager as part of his duties.

The cremator rooms are part of the administrative block with little room for expansion. The cremator is run on bottled gas. The chapel is a separate building.

Average cremation revenue is over \$600 with chapel service revenue averaging \$30.

## 6.6. Generic crematorium

We have used the estimates above to provide an indication of the costs and revenues faced by a generic crematorium or indeed a hypothetical entrant in the fundamental analysis (Chapter 7). We have used power costs of \$21 reflecting the likelihood that an entrant/generic provider would not achieve the significant economies of larger crematoria nor face the high costs associated with Traralgon. While only Springvale provided extensive details of its variable costs, it was considered that these itemised elements should be included.

Reflecting the common approach of maintaining existing minor capital items, an annual maintenance charge of 5% of capital costs was included. The representative crematorium was expected to include all standard operating equipment though not the extensive building equipment as found in say Springvale. These capital costs were estimated to be of the order of \$20,000 for processor, pans, trolley, charging bier and cool room. A similar charge was made for maintenance of buildings. A new operation that sought to meet higher environmental and workplace standards may incur significantly higher costs.

As noted above there is a significant range of estimates for allocated overheads. For the purposes of the analysis (and reflecting the allocation already of \$35 in variable other costs), we have used an allocation of \$50,000 for administrative/management overheads.

For the purposes of the analysis, the furnace costs were based on a \$235,000 unit, with rehearth and rebricking costs of \$7,500 and \$45,000 every 3,500 and 7,000 cremations, respectively. Replacement of the unit was assumed every 14,000 cremations.

Revenues for cremations were assumed to be \$600, with a further \$60 for each service and \$600 for a memorial.

## 6.7. Comparisons with Other Jurisdictions

In Australia, consumers typically arrange a cremation through a funeral director (the 'customer'). Minimum charges for disposal via cremation appear to be approximately \$2,400.<sup>28</sup>

Investigation of crematoria was undertaken as part of the ACT's NCP Review. In its Issues paper<sup>29</sup>, CIE found:

*Cremation is cheaper than burial. The cost for the basic service of \$630 is less than that of burials, which for a basic service is around \$1000. This cost includes use of the chapel and the cremation process itself, but does not include fees for Memorial or funeral director services.*

*The establishment costs for crematoria have been estimated to be between \$750 000 – \$1 million, inclusive of a chapel, with a 'breakeven' point of 300 cremations per annum, according to Service Corporation International Australia Pty Ltd (Strategic Plan for the Provision of Cemetery Services, prepared for the Trustees of the Canberra Public Cemeteries, May 1998).*

This section considers factors impacting on provision of cremation services in some other jurisdictions as follows:

- New South Wales;
- Queensland;
- InvoCare (NSW and QLD);
- United States;

<sup>28</sup> Advertisements from Commendable Cremations (Qld), Sensible Funerals (SA) and advice from Combined Pensioners and Superannuants Association of NSW (2003) *Fact Sheet - Funeral Costs*, September

<sup>29</sup> CIE 1998, p. 9.

- United Kingdom;
- Hong Kong.

We devote a separate section to InvoCare (a trading name for Services Corporation International Australia) due to their influence in the Australian industry. SCIA is a multi-national firm providing vertically integrated services, including nursing homes, funeral homes, cemeteries and crematoria<sup>30</sup>.

### 6.7.1. New South Wales

NSW is serviced by over 20 crematoria including private, Trust and local council providers.<sup>31</sup>

In the Sydney area, provision of cremation services is currently dominated by InvoCare. This may change slightly in the Ryde area with the opening of a new public crematorium. The Macquarie Park Cemetery Trust in north-eastern Sydney are currently undertaking construction of a new crematorium, with expected completion in November 2004.

In areas outside Sydney, there is greater public sector involvement. In addition to a few Cemetery Trusts, many Councils provide cremation services (they do not operate as trusts, as in Victoria).

In NSW, the staff of private and Cemetery Trust crematoria are apparently associated with a different union than the council facilities. One potentially costly difference relates to union rules regarding delivery of coffins to crematoria. At private and Cemetery Trust crematoria, coffins (containing corpses) must be delivered to the *front door* of the facility or chapel. They must be delivered singly and by a specific vehicle (a hearse), rather than a transport van. The coffin must be transported to the crematorium processing area by at least three males or at least three females from the hearse, through the front door of the facility and via the chapel and catafalque. InvoCare report that this significantly increases costs – they typically transport three or more coffins at a time via the same number of hearses, utilising all drivers to transport coffins through the chapel to the processing area<sup>32</sup>. (Note that InvoCare's situation is somewhat different, as they are often also responsible for the funeral home from where the coffin is being delivered.) This appears to contrast with the situation in Victoria, where multiple coffins are efficiently *delivered directly via transport van to the rear processing area* of the crematorium.

In addition to looking at InvoCare in more detail, below we consider NSW council-run facilities and the crematorium run by the Woronora Trust.

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<sup>30</sup> Nursing homes are not provided under the trading name InvoCare and will not be discussed here.

<sup>31</sup> Indeed just over the border from north-east Victoria, cremation services are provided by both the Albury council and a private provider.

<sup>32</sup> Mr Koss Adrichem, Manager (Cremation Services), InvoCare.

## Council facilities

Charges for cremation vary across the State . In terms of council provided cremations, in 2003-04:

**Table 22 – NSW Council Cremation Charges: Adult rate 2003-04**

	Rate	Method used
Shoalhaven	\$615	Cost recovery
Wollongong	\$481	Market forces
Hastings	\$693	Market forces
Wagga Wagga	\$590	Cost recovery
Lismore	\$620	Market forces

Sources: Shoalhaven City Council (2003) *Management Plan 2003 – 2006 – Volume 2 Fees & Charges 1 July 2003 – 30 June 2004*, Wollongong (2004) *Fees and Charges 2004-05 (Draft)*, Hastings Council (2004) *Schedule of Fees and Charges 2004-05 (Preliminary)*, City of Wagga Wagga (2004) *2004-05 Adopted Management Plan – Part C Revenue and Pricing Policies*, Lismore (2004) *Business & Enterprise Fees and Charges 2004-05*

The ‘cost recovery’ method does not include a commercial mark-up and:

*The pricing method used in determining Cemeteries and Crematorium’s Fees and Charges is the **market** pricing method whereby fees and charges are based on current market fee structures. The market price is usually determined by examining competitors’ prices and may have little relationship to the cost of providing the service. It is anticipated that council will be subsidising this business activity due to the service being provided on a less than cost recovery basis.<sup>33</sup>*

Based on this approach the charge (for adults) was \$481 and expected to rise to \$500 in 2004-05. Chapel fees add a further \$66.50 (\$70.00).

It is of interest that a number of councils have investigated building crematoria, such as Muswellbrook, Waverley and MacLean.

## Woronora

The Woronora Cemetery Trust<sup>34</sup> operates a cemetery and crematorium approximately 25km south-west of Sydney. They utilise three Parsons Tabo cremator units, with an annual throughput of approximately 2,300 cremations.

In addition to burial and cremation, the Trust provide a range of memorialisation options and chapel services. They have a cool room to store corpses for up to 48 hours.

The standard cremation fee is \$776 and delivery only is \$693.

In discussion with the Trust, no significant differences in cost drivers for provision of cremation services by Victorian Cemetery Trusts could be identified.

<sup>33</sup> Wollongong (2004) *Fees and Charges 2004-05 (Draft)*

<sup>34</sup> Ivan Weber, CEO Woronora Crematorium (NSW).

## 6.7.2. InvoCare (NSW and QLD)<sup>35</sup>

Any consideration of the cremation industry in Sydney and Brisbane must include reference to InvoCare. Formerly known as SCIA (Services Corporation International Australia), InvoCare are representative of the globalisation of the death care industry. They have made a major contribution to structural changes in the Australian industry over the last decade, in particular through acquisitions and vertical integration of services along the eastern seaboard. They were publicly listed in December 2003.

### Operations & services

In addition to approximately 145 funeral homes, InvoCare operate nine crematoria in NSW and three in Queensland as follows:

	Suburb/town	Area
<b>New South Wales</b>		
Newcastle Memorial Park	Beresfield	Near Newcastle
Lakeside Memorial Park	Dapto	Near Wollongong
Pinegrove Memorial Park	Minchinbury	Near Penrith (west of Sydney)
Forest Lawn Memorial Park	Leppington	
*Rookwood Crematorium	Rookwood Necropolis	Near Parramatta (western Sydney)
*Northern Suburbs Crematorium	North Ryde	North-western Sydney
Castlebrook Memorial Park	Rouse Hill	Between Penrith & Parramatta
Lake Macquarie Memorial Park	Ryhope	South-west of Newcastle
*Tweed Heads Memorial Gardens	Tweed Heads South	Near the QLD border on the coast
<b>Queensland</b>		
Mt Thompson Memorial Gardens (3 cremator units)	Holland Park	Brisbane
Albany Creek Memorial Park (2 cremators units)	Bridgeman Downs	Brisbane, northern suburbs
Allambe Memorial Park	Nerang	Gold Coast area

\* Standalone crematorium facilities (not associated InvoCare cemetery).

The number of cremator units is shown where known, but no other detailed information is available regarding the scope and scale of these facilities. As shown, all except three are associated with InvoCare cemeteries or memorial parks. Several cemeteries have been built around existing crematoria. Most have InvoCare funeral homes closely associated with them, and consequently have access to associated chapel facilities.

InvoCare have a long-term lease of the Rookwood Crematorium (to 2020). This rental reportedly provides a significant contribution towards the associated (public) cemetery's ongoing maintenance.

InvoCare undertake approximately 22,000 cremations per annum, however the distribution across their facilities is not available to this study.

InvoCare aim to concentrate solely on what they believe their consumers really want. For this reason they do not offer limited tenure for burial and memorialisation.

<sup>35</sup> Source (except publicly available information and where otherwise noted): Mr Koss Adrichem, Manager (Cremation Services), InvoCare.



*In all of InvoCare's cemeteries and crematoria, graves and memorials are carefully maintained in perpetuity without any ongoing cost - something that many other cemeteries in Australia do not offer.<sup>36</sup>*

They have also not gone down the route of offering alternative types of memorialisation, such as a 'book of remembrance'. Their judgement has been that books of remembrance are not a commercially favourable proposition in the longer term (despite arguably lower maintenance costs). It is interesting to note that the trend in Victoria now seems to be away from such alternatives to 'in-ground' memorialisation.

### Marketing & brands

InvoCare maintain several well known Australian funeral brands of varying scope and with particular alignment to market segments. Their network of locations, range of brands and integration of different service offerings (e.g., funerals and cremations) places them in a uniquely strong position to capture market share. Many of these synergies and advantages, most notably vertical integration, are not available to Victorian Cemetery Trusts.

Brand	Scope	Alignment to market segment
White Lady	National	'Involved'
Simplicity	National	'Practical'
Guardian	National?	'Traditional'
Le Pine (over 100 years old)	Melbourne	?
Purslowes	Perth	?
Blackwells	Adelaide	?
Hartnetts	Brisbane	?

Source: InvoCare Limited - 2004 Annual General Meeting report. '?' indicates information unknown.

They report confidence in being able to maintain sustainable growth over time through<sup>37</sup>:

- Improving service levels
- Positioning of funeral brands in the market place
- Pursuing acquisitions
- Improving efficiencies, capitalising on the existing capacity
- Reducing debt.

<sup>36</sup> [www.invocare.com.au](http://www.invocare.com.au)

<sup>37</sup> 2004 InvoCare Annual General Meeting – Chairman's Overview

InvoCare also conduct extensive surveys of client satisfaction which highlight areas for improvement and business opportunities in provision of products and services. They report a 40% response rate to surveys sent to funeral clients<sup>38</sup>:

- *For 12 months ended April 2004 client satisfaction has improved over 8%.*
- *97% of clients indicate they will either definitely or probably recommend InvoCare funeral homes.*

InvoCare are planning to introduce a similar survey for cemeteries & crematoria in 2004.

### Revenue drivers & market share

InvoCare's reported operating margin for 2003 was 29% (note that this covers all of their operations).<sup>39</sup>

They report their key drivers of revenue (for funerals and cremation) to be:

- Market share
- Number of deaths
- Average spend

They have identified the business' two major risks as "adverse movements in number of deaths" and increased competition. The number of deaths in NSW is largely irrelevant to the Victorian situation (which has been covered elsewhere in depth).

InvoCare report an average increase of 5% in the average dollar spend on funerals, cemetery & cremation services in 2003-4.

In 2003-4, InvoCare claim to have performed 15% of Australia's cremation and burial services, or a 29% market share in the markets where they operate (NSW and QLD).

Despite management believing it has maintained strong cemetery & crematoria market share, they are aware of the risk involved with the imminent new competition from a crematorium at Macquarie Park. Management have reported difficulty in estimating the likely financial impact on operations until the facility is completed and operational.

*At this stage the only guidance given to the market is a potential \$300K EBITDA loss for every 5% loss in market share at InvoCare's Northern Suburbs Crematorium facility. A 5% EBITDA loss represents less than 1% of the company's overall projected EBITDA for 2004.*

In terms of memorialisation market share, they report little recent change in overall memorialisation rates for cremated remains.

*Increasing the memorialisation rate continues to be a challenge for both InvoCare and the industry in raising consumer awareness of the many memorial options available.<sup>40</sup>*

<sup>38</sup> 2004 InvoCare Annual General Meeting – Chairman's Overview

<sup>39</sup> 2004 InvoCare Annual General Meeting – Chairman's Overview

<sup>40</sup> InvoCare Limited - 2004 Annual General Meeting

InvoCare perform approximately 20% of Australian funerals, and effective market share is closer to 30% in the markets where they operate.

### Economies of scale and scope

InvoCare enjoy a number of economies of scale and scope that are not available to Victorian Cemetery Trusts, as presented below. As stated by InvoCare's Chairman at their 2004 AGM:

*InvoCare's operational infrastructure enables it to accommodate growth at low cost.*

*Management consistently strive to improve efficiencies.*

They are planning to open several new locations for one or more major brands in the next year. This will "utilise existing available capacity at InvoCare service centres" and "leverage high brand awareness of individual brands".

The fragmented nature of the 'death care' industry lends itself to acquisition. InvoCare (formerly SCIA) have successfully pursued an aggressive acquisitions strategy in Australia over the last 15 years. As stated in the 2003-4 report, management are naturally "keen to pursue acquisition opportunities if they are relevant, realistically priced and a good fit with business strategy". They are:

*Focused on delivering earnings growth at a meaningful return on shareholders investment.*

*Acquisitions are likely to occur in either capital cities or major regional centres where 65% plus of the population resides.*

*Timing is likely to be sporadic. No assurances of an acquisition this year.*

Commencing late in 2004, they are planning to implement a new management information system. This will have the capability to:

*Report utilisation rates of key resources, highlighting opportunities and issues to address.*

*Continual assessment of the return on investment in owned properties.*

*Likely to lead to divestitures from time to time.*

### Costs associated with equipment, parts and labour

InvoCare's approach to purchase and maintenance of cremation equipment does appear to distinguish it from public sector providers of cremation services.

In making equipment purchasing and maintenance decisions, InvoCare have a long-term focus on machinery which can provide the required essentials to the business while keeping costs at a minimum. Their approach is that cremator units should be simple furnaces.

Many of their units are the older style ‘reflux’ machines<sup>41</sup>, even though these have gone out of favour with manufacturers and are rarely now used by public sector providers. This reduces wear on the bricks by maintaining more even and constant heat levels and reduces energy usage. They also report enjoying a very significant reduction in energy costs upon changing suppliers, after the introduction of competition in NSW.

Although InvoCare have a small minority of Major units, the bulk of their cremators are ‘low tech’, older-style, locally-produced furnaces. They had some more modern Major units, but found they had considerably higher ongoing maintenance costs. They would often find Major’s Australian presence to be too limited, on occasion for example needing to fly out engineers from Major in England.

In general, the focus is on maintaining and repairing older, simpler equipment, rather than purchasing newer styles of equipment. Several of their cremators are over 40 years old and still in good working order.

Their units are mainly locally made (for example by R & Y Engineering of Somersby, NSW). They find this greatly reduces the cost of parts and servicing. They report that these units have fewer breakdowns and that it is easier for them to service them with in-house skills, because of the simpler technology. These units are apparently not nearly as aesthetically pleasing, but this is not considered as important as simplicity of operation and maintenance.

They perform very regular minor maintenance (“patch jobs”) on their cremator units (reportedly far more commonly than other operators). They believe this lowers costs by reducing the frequency of major maintenance – they report that major rebricks are required only very rarely.

In addition, InvoCare have cool rooms at all crematoria locations. They routinely store corpses for up to 48 hours, to smooth utilisation levels. A cremator unit may not be fired up and several corpses may be ‘held over’ for 1-2 days, so that a bigger batch is processed at once. As described elsewhere, this greatly reduces wear on the furnace bricks and consequent rebricking costs. Hence, they do not focus on ‘full service provision’ (in this case, same day cremation service) to the detriment of efficiencies and basic cost reduction strategies.

### Cremation price

Details of InvoCare’s direct prices for cremation (to the funeral director which acts as the customer) have not been forthcoming. Prices are the reportedly equal across InvoCare’s NSW facilities, except for Rookwood where slightly higher prices are charged to recover the cost of rent. Prices are also reportedly slightly higher at the QLD facilities.

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<sup>41</sup> Reflux - two cremators are joined by a tunnel and efficiencies are realised through transfer of heat between the chambers at various stages.

### 6.7.3. Queensland

Within the Brisbane area, there are a number of providers of cremation services. It is difficult to determine the exact number of providers as funeral directors can provide cremation services as part of their operations. Typically, these smaller operators will only be able to conduct a couple of cremations per day. Two major providers are the Brisbane City Council which operates three crematoria facilities (each with one furnace) and InvoCare which has two crematoria with two and three furnaces operating.

A third provider (Bledisloe operating Great Southern Gardens in Logan City) also uses one furnace. In addition to the west of the city, cremation services are also provided by an independent supplier at Heritage Park and separately by an operation run jointly by two funeral directors. There is one major provider on the Gold Coast (also in competition with an InvoCare provider at Tweed Heads) and two on the Sunshine Coast. In addition there are a significant number of funeral directors on the Sunshine Coast providing cremation services. Across the range of providers cremation services (including chapel use) will typically range from \$400 to \$550.<sup>42</sup>

The Brisbane City Council charges \$588. In terms of the NSW categories, these prices reflect market forces, though they note that the council operations are a “market leader”. For council operations, the major drivers are the operation of the furnaces and the power requirements. The council-run crematoria differ from private operators (or indeed self-funded trusts) in that major capital works, such as chapels, are part of the annual bid process within the council. These do not appear to be reflected in their prices. The council operations use furnaces that are capable of around eight cremations per day (standard working hours). In general, almost all (90%) of these cremations will include a chapel service.<sup>43</sup>

These charges are not out of line with those of a private operator, Newhaven, which operates out of Cairns, Mackay, Brisbane and the Gold Coast, and advertises pre-arranged cremation for \$605 within their crematorium. This is, however, part of a package that costs a minimum of \$4,000.

The charges set in south east Queensland appear to be up to \$200 below that charged by Victorian operators. It is not clear, however, whether these charges are comparable with Victorian operations where there may be bundling of services and council funding of major works.

### 6.7.4. United States

Information on cremation operations in the United States is limited. A significant proportion of cremations are undertaken by private suppliers, either as separate entities or as part of a larger funeral home. Indeed, vertical integration appears more common than in Australia or the UK.

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<sup>42</sup> *pers. comm.* Robert Luscombe President QCCA, 23 September provided much of the background information on the situation in south east Queensland.

<sup>43</sup> Brisbane City Council Cemeteries and Crematoria Section, 23 September

In contrast with other western nations, cremation is the lesser option in the United States. In 2003, only 28.63% of deaths were cremated. Within the country however, there is a very wide range of cremation rates ranging from 3% to over 60%. Based on preliminary projections for 2003, Table 23 shows the proportions for the ten states with the highest cremation rate and the ten states with the lowest proportion.

**Table 23 – Proportion of Deaths that are Cremated – Preliminary Projections 2003**

<i>State</i>	<i>Proportion Cremated</i>	<i>State</i>	<i>Proportion Cremated</i>
<i>Top ten</i>		<i>Bottom ten</i>	
Hawaii	62.94%	South Carolina	17.38%
Washington	61.81%	Indiana	17.29%
Nevada	61.38%	Arkansas	17.09%
Oregon	60.43%	North Dakota	15.69%
Arizona	57.39%	West Virginia	14.47%
Alaska	55.47%	Louisiana	13.21%
Montana	54.65%	Kentucky	9.76%
California	52.61%	Mississippi	8.10%
Colorado	52.23%	Alabama	4.56%
Maine	50.37%	Tennessee	3.22%

Source: Cremation Association of North America, <http://www.cremationassociation.org/docs/WebPrelim.pdf>

The pattern of popularity of cremation is shown in A feature of cremation in the US is the important role of funeral homes in its provision. Indeed, the Government Accountability Office (GAO) noted that one of the reasons the Tri-State Crematory had not been covered by Georgia’s regulations (and subject to inspections) was that the regulations had defined a crematory as “... any place owned by a funeral director or funeral establishment where cremation is performed”.

Figure 12. Rates are highest in the western states and lowest in the south east. The pattern has been attributed to:

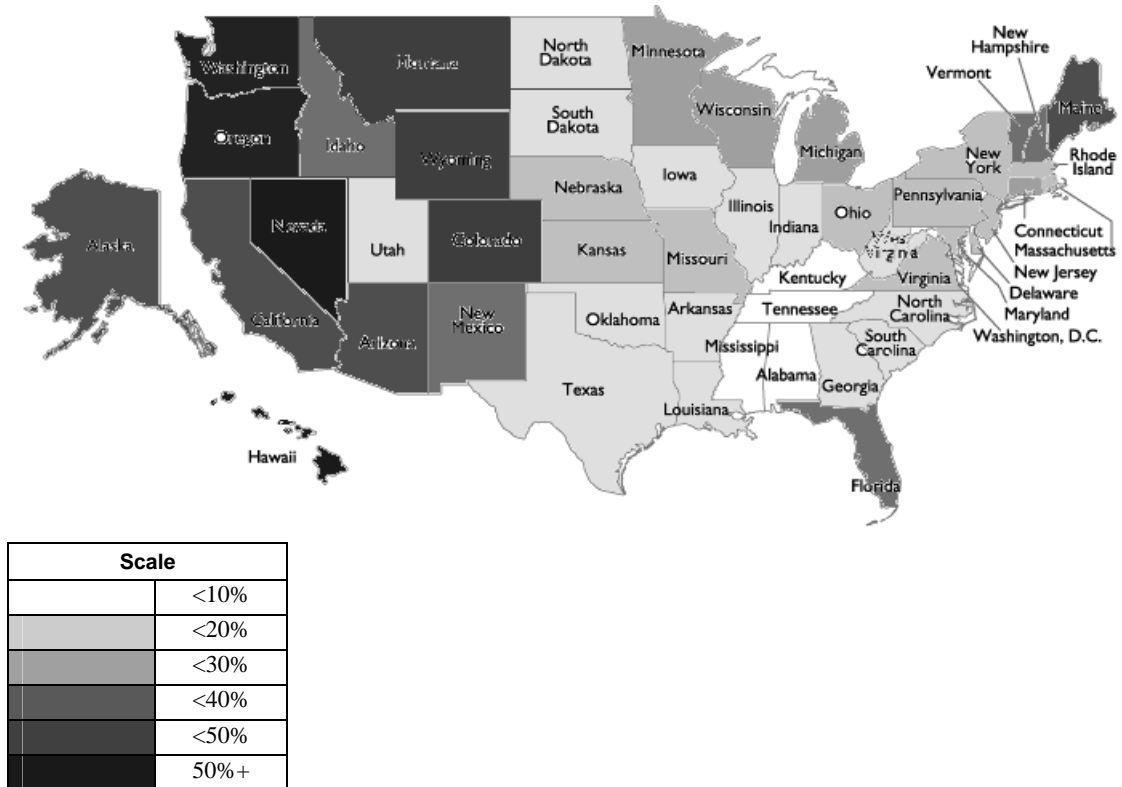
- population mobility – the greater the proportion of the population without roots, the higher the cremation rate. This is particularly used to explain Florida’s high rate; and
- ethno-religious considerations. Cremation is very low among afro-americans and catholics.

In addition, cremation has been found to be higher among better educated.

A feature of cremation in the US is the important role of funeral homes in its provision. Indeed, the Government Accountability Office (GAO) noted that one of the reasons the Tri-State Crematory had not been covered by Georgia’s regulations (and subject to inspections) was that the regulations had defined a crematory as “... any place owned by a funeral director or funeral establishment where cremation is performed”.<sup>44</sup>

<sup>44</sup> GAO (2003) *Death Care Industry – Regulation Varies across States and by Industry Segment*, Report to Congressional Requesters, GAO-03-757, August, p. 9 fn 9.

**Figure 12 – Pattern Of Cremation – US**



Reflecting the concerns about prices for death care, the Federal Trade Commission investigated pricing practices in 1994 and amended their rule applying to funeral homes and funeral service providers. As part of the required General Pricing List (GPL), funeral homes are required to quote a price for Direct Cremation, which comprises no committal services, defined transport of the body, the option for the bereaved to supply the “cremation container” and return of the ashes. Where the funeral home provides the cremation facility, the home is recommended to inform about the cremation fee. Where they do not provide cremation, consumers are to be notified that an extra fee can be charged by the external cremation supplier.

Another response to the high cost of death care has been the growth of cremation societies.<sup>45</sup> These offer members a low cost option, either with an upfront payment or a schedule of instalments. It is important to note that these charges may include a set period of refrigeration. provides a sample of charges for Direct Cremation for a number of suppliers across the US and where available the listed cremation fee on a funeral homes GPL.

<sup>45</sup> WE note that in one case, a funeral home has acquired its cremation facilities by purchasing a local society.

**Table 24 – Selection of Direct Cremation Charges and Cremation Fee Components  
\$US**

<i>Name</i>	<i>State</i>	<i>Direct Cremation Charge</i>	<i>Cremation Fee</i>
<b>Societies</b>			
Neptune Society <sup>1</sup>	CA		
Fresno		\$1,295	\$295
Bakersfield		\$1,295	\$245
Orange		\$1,499	\$395
San Jose		\$1,645	\$395
Nautilus Society	CA		
Bay Area		\$1,295	\$245
Beach Cities		\$1,345	\$300
Sacramento		\$1,295	\$215
Cremation Society			
Indiana (“Basic cremation”)	IN	\$695	
Alabama	AL	\$995	
<b>Funeral homes</b>			
Bethany Funeral Home	NE	\$1,195	\$200
Boulger Funeral Home	ND	\$945	\$215
Pacific Interment Mortuary and Crematory	CA	\$850	\$215
Schmidt & Bartelt Funeral & Cremation Services (2000 prices)	WI	\$1,595	\$350
Columbia Funeral Home & Crematory	WA	\$920	\$350
Flintofts Funeral Home & Crematory	WA	\$900	np
M <sup>c</sup> Alister-Smith Funeral Homes	SC	\$1,845	\$250
Lambert Funeral Homes & Crematory	NH	\$875	\$250
Hawthorne Funeral Home & Memorial Park	WA	\$1,750	np
Virgil T Golden Funeral Home	OR	\$498	\$145
Heald Funeral Home	ME	\$2,345	\$275
Kirlin-Egan & Butler Funeral Home & Cremation Tribute Center	IL	\$1,850	\$250
Jay Chapel Funeral Directors	CA	\$2,375	\$233.50
Norton Funeral Home	SC	\$1,645	np

1 Charge includes transportation up to 75 miles from society location.

np not published in GPL

The prices shown in the table suggest that the cremation component of the Direct Cremation fee is minor. It is also important to emphasise that the major component of the charge is the funeral home director’s charge. As these charges are bundled, it is not clear if the cremation fee is a ‘viable’ charge.

The range of cremation fees listed are equivalent to a range of A\$ 207 to A\$ 564 (using an indicative exchange rate of A\$ 1 = \$US 0.70). This suggests that the lowest cost in-house cremation operations in the US set a notional cremation fee not dissimilar to the lowest cost Victorian operations.



### 6.7.5. United Kingdom

Cremation is the dominant method of disposal in the UK accounting for around three-quarters of disposals. In 2003, there were 442,538 cremations across 245 crematoria.<sup>46</sup> The majority of these are memorialised though some 40 per cent are taken away from the crematoria.

As in the US, cremation rates are affected by religion with lower rates reported for Catholics and Muslims. In addition, distance to a crematorium is a key determinant of the decision to bury or cremate.<sup>47</sup> For example, Cambridge City Council estimated that its catchment area was a circle of around 30 miles in diameter (that is, within 24.1 km).<sup>48</sup>

Cremations in the UK are undertaken by both private and public crematoria. However, the latter dominate with provision undertaken by council-owned suppliers. In 2000, the Cremation Society of Great Britain estimated that "... approximately (sic) 193 of the 242 crematoria operating in Great Britain are owned or operated by local authorities."<sup>49</sup> This latter point is important as profits from cemetery and cremation operations are absorbed by the local council. In addition, the operations are part of overall council operations. For example in the case of Cambridge City Council, the crematorium is operated with the Parks and Recreation Section of Community Services. In addition, these council-run crematoria are likely to be more service focussed for rate payers. Crematoria operating under the Federation of British Cremation Authorities *Code of Cremation Practice*:

#### 3. After Committal

...

- ii) *On the day when the Committal Service takes place, provided necessary Authority to Cremate has been received, the coffin and its contents shall be put into the cremator exactly how it has been received on the catafalque, and cremated.*

Crematoria are very profitable operations for their operators. In response to a query<sup>50</sup> that

*Do you think that an effect of the new regulations could be fewer crematoria?*

, Dr Hussein<sup>51</sup> stated

*No. It is very difficult to run a crematoria without a surplus and I think that cremation can sustain either the extension of existing crematoria or the building of new ones ...*

<sup>46</sup> Cremation Society of Great Britain, [www.srgw.demon.co.uk/CremSoc4/Stats/National/2003/CremTab2.html](http://www.srgw.demon.co.uk/CremSoc4/Stats/National/2003/CremTab2.html)

<sup>47</sup> UK Parliament (2001) *Examination of Witnesses*, Select Committee on Environment, Transport and Regional Affairs inquiry into Cemeteries, 9 January, evidence by Dr Ian Hussein.

<sup>48</sup> Cambridge City Council (2002) *Best Value Review of Crematorium and Cemeteries Services*, February, p. 10.

<sup>49</sup> UK Parliament (2001) *Memorandum by the Cremation Society of Great Britain*, Select Committee on Environment, Transport and Regional Affairs inquiry into Cemeteries, CEM 99.

<sup>50</sup> UK Parliament (2001) *Examination of Witnesses*, Select Committee on Environment, Transport and Regional Affairs inquiry into Cemeteries, 9 January.

<sup>51</sup> President of the Institute of Burial and Cremation Administration and Director of the City of London Cemetery and Crematorium.

The query was prompted by a review of the impact of filtering mercury from cremation emissions, in which the Environment Agency's Local Authority Unit found that around one-quarter of crematoria would be unable to meet the costs of the required upgrade. This was despite:

*The publicly owned crematoria received an average surplus over costs of £67 per cremation in 1998-99 according to data submitted to Chartered Institute of Public Finance Accountants (CIPFA) and summarised in Resurgam (vol43 p54). Adult cremation costs range from £100 to £360 per cremation in 1998/9. It would therefore appear that there is scope for the average plant to absorb a reasonable proportion of such costs although, of course, much of the cost will be passed on to the client.<sup>52</sup>*

Most UK crematoria operate at throughput levels of over 1,000 cremations per year (Table 25– and most cremations are conducted at these crematoria). They are therefore similar in scale to the metropolitan crematoria in Victoria.

**Table 25 – Estimated additional cost per cremation for installing gas cleaning at existing crematoria**

Number of cremations in 1999	Number of crematoria, (excluding 3 new in 1999)	Average cost per cremation	Percentage of UK cremations in 1999
Over 978	204	£47 to £67	95%
978 - 700	19	£47 to £63	3.4%
700 – 500	10	£47 to £63	1.3%
Under 500	3	Over £63	0.3%

Source: Department for Environment, Food and Rural Affairs (2002), p. 11

While information generally on the cemetery sector is limited,<sup>53</sup> annual reviews of crematoria provide some details for comparison.<sup>54</sup> It is of note that the data are not standardised nor do councils provide similar funding approaches to their operations. For example, in reviewing its relative position in the CIPFA, Cambridge<sup>55</sup> noted:

- it was one of the few authorities to provide two chapels (and full organist facilities);
- it sets a very high rateable value. In fact, it repaid £100,000 in 2000 and may lower this value further;
- the City includes an explicit annual allowance for major repairs and renewals; and overall
- queried the comparability of the data.

<sup>52</sup> Department for Environment, Food and Rural Affairs (2002) *Mercury Emissions from Crematoria*, Consultation on an assessment by the Environment Authority's Local Authority Unit, p. 12

<sup>53</sup> "We do not even know how many burial authorities there are, still less how many cemeteries. The number of denominational burial grounds in operation is unknown. There are no statistics on the amount of burial space available across the country, or how long that space is likely to last. No information is available about how cemeteries are run, or how many are operational and how many closed" (Cemeteries, Eighth Report of the Department for Environment, Transport and Regions Select Committee, para 10). quoted in Wilson, Brenda and Robson, Jill (2004) *Cemeteries and their Management*, Home Office Online Report 01/04, January, p. 1.

<sup>54</sup> The Chartered Institute of Public Finance and Accountancy (CIPFA) Statistical Information Service annual report *Crematoria Statistics*.

<sup>55</sup> Cambridge City Council (2002) *Best Value Review of Crematorium and Cemeteries Services*, February. Cambridge was referring to the 1999/2000 CIPFA data.

The most recent statistical review of crematoria (2002-03)<sup>56</sup> found that for the 142 crematoria that responded:<sup>57</sup>

- expenditure on employees, premises, support and other running costs averaged £181.81 per cremation (or A\$ 464);
- in addition, capital charges averaged £37.46 per cremation (or A\$ 96);
- average income of £299.67 per cremation (or A\$ 764); and therefore
- a before capital charge surplus of £117.86 per cremation (A\$ 301).

This information suggests that costs in Victorian crematoria are broadly in line with experience in the UK and probably significantly lower in terms of operating costs. It is important to remember, however, that the councils charge significant amounts for rates and may operate more committal services.

### 6.7.6. Hong Kong

In 2003, there were 30,161 cremations in Hong Kong and 5,474 burials (coffin). The 85% cremation rate compares with 68% in 1993 and 35% in 1976<sup>58</sup>. Hong Kong was serviced by six public crematoria namely, the Cape Collinson Crematorium (10 furnaces), Diamond Hill Crematorium (DHC – 6 furnaces), Kwai Chung Crematorium (KCC – 4 furnaces), Fu Shan Crematorium (FSC – 4 furnaces), Wo Hop Shek Crematorium (WHSC – 4 furnaces) and Cheung Chau Crematorium (2 furnaces). They are situated in six different locations of HK to provide cremation service to the public.<sup>59</sup>

Public cremation is operated through the Food and Environmental Hygiene Department (FEHD) and is run separately from cemetery operations. The service provided by the government includes service halls for the family to perform cremation rite.

Reflecting the lack of space in the territory, the government has had a long-standing policy of promoting cremation. For example, after six years human remains buried in public cemeteries must be exhumed to be cremated or buried in an urn cemetery. Promotion of cremation included the subsidisation of cremation charges. In preparation for handover, in 1999 the government examined different pricing policies between the urban and regional provinces<sup>60</sup>. At that time, cremations received up to a 50% subsidy (in urban province) from the government compared with 30% for burial. This policy was continued following the return to the China.

Separate from the cremation service, the government sells niches also in competition with private cemeteries and other private providers.

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<sup>56</sup> The Chartered Institute of Public Finance and Accountancy (2004) *Crematoria Statistics 2002-03 Actuals*, SIS Ref. 61.03, March

<sup>57</sup> For comparison purposes, using £1 = A\$ 2.55.

<sup>58</sup> Teather, Elizabeth Kenworthy (undated) *Homes for the Ancestors: establishing new traditions of burial through the provision of columbaria in Hong Kong*, accessed 23 August 2004.

<sup>59</sup> This section benefited from assistance by SK Yeung – Assistant Director (Operations) FEHD. The AUD/HKD exchange rate used was 0.1809. For comparison purposes, in 2002, the rate averaged \$HK 1 = A\$ 0.2348 and in 2001 \$HK 1 = A\$ 0.25.

<sup>60</sup> The provinces had responsibility for cremations under the previous British administration.

Current cremation charges at public crematoria are shown in Table 26. The level of these charges is close to the minimum cost of cremation in Victoria.

**Table 26 – Cremation Charges in Hong Kong**

	Adult (over 12 years)	Under 12 years
Urban	\$HK 1,300 (A\$ 235)	\$HK 650 (A\$ 118)
New Territories & Islands	\$HK 1,220 (A\$ 221)	\$HK 915 (A\$ 166)

Source: Food and Environmental Hygiene Department, *Booking of Cremation Services*, <http://www.fehd.gov.hk/cc/ccstatus/01ENG01.HTML>

In the past few years, the government undertook significant upgrades to its crematoria to meet concerns about pollution (visual and odour) and capacity.

In 2003, the cremators at Kwai Chung were replaced.<sup>61</sup> Debate on the procedure noted that the new cremators would have a cremation time of 1 ¼ hours compared with the existing time of 2 ½ hours. This would assist meeting the performance pledge of cremation with 15 days of application.

The government reviewed the Fu Shan Crematorium, Sha Tin. In 2002, the Public Works Committee investigated the replacement of two twin cremators for \$HK 109.3m or A\$ 25m. Expected completion time was June 2004. This included the cost of a new cremation room, renovations to existing rooms, automated coffin delivery, modifications to car parks and landscaping. The cost of replacing the existing two twin cremators with four single cremators was expected to be \$HK 64m or A\$ 12m. The cremators have a high temperature secondary combustion chamber, flue gas filtering and air quality monitoring systems. These replace cremators that were installed in 1984 and were near the end of their serviceable life.<sup>62</sup>

The FEHD noted that

*As cremators normally have a service life of 15 to 20 years, we have a regular replacement programme to replace the old cremators which are approaching the end of their serviceable life. Under our replacement programme, the new KCC was commissioned in April 2003 to replace the old one while the new cremators in the FSC would be ready for use by early October 2004. Construction works for the new DHC are scheduled to commence in October 2004 for completion of Phase I (commissioning of new cremators) and Phase II (other facilities) by June 2006 and April 2008 respectively. In addition, we have active planning for replacing the existing cremators in the WHSC in 2008-09 to meet the increasing cremation demand beyond 2012. All new cremators which have been put in place have high cremation output and are able to meet local and international standards on air pollution control. Additional costs for operating and monitoring the new cremators in KCC and FSC are paid to our maintenance agent (i.e. Electrical and Mechanical Services Trading Fund (EMSTF) under a Service Level Agreement (SLA) covering all 6 government crematoria. The SLA including the overall price level is subject to annual*

<sup>61</sup> Previously, the cremators at Cape Collision had been replaced over the period 1995 to 2001.

<sup>62</sup> In particular, service costs had risen appreciably in recent years.

*review. The maintenance cost for the 6 crematoria for 2003-04 under the SLA was AUD 3.59 million (based on a mean exchange rate of 100 AUD to 552.8 HK\$ as on 1.9.2004). Owing to heavy demand, our cremators are normally operated 8 to 10 hours per day. We do not have any experience that maintenance cost per cremator would likely fall with greater use.*<sup>63</sup>

The Department observed (in response to a proposal to close Diamond Hill and operate Kwai Chung and Fu Shan for longer periods per day) that “*there would be faster wear and tear of the cremators, and the life span of the cremators would be shortened. An increase in sessions was therefore not recommended in view of the high repair and replacement costs, and the disruption to cremation service caused by deteriorating performance standards.*”<sup>64</sup> This observation by the Hong Kong officials differs from that expressed by Victorian operators on the benefits of regular usage.

Recent investment in Hong Kong appears to have replaced most of the furnaces with modern machines.

*The capital cost for the new KCC is some AUD 25.32 million while that for the new FSC is about AUD 19.72 million (both providing 4 new cremators); that for the new DHC (with 6 cremators) is around AUD 41.79 million. We have no information on the capital cost for the other three old, traditional government crematoria since our department was only established in 2000. Besides, as they were built over 10 years ago, their capital costs were expected to be relatively small compared with the new cremators.*

This implies average capital costs of between A\$4m to A\$7m per furnace. This suggests that with a life of around 30,000 cremations (say 1,500 per year over 20 years) the capital charge would be around A\$250 per cremation. This specification is well in excess (in terms of cost and implied throughput) of those used in Victoria and 50% above the average throughput currently being met in Hong Kong crematoria. At 1,000 cremations per furnace per annum, a capital charge would be of the order of over A\$300 per cremation.

In terms of maintenance, FEHD pays of the order of A\$120,000 per furnace under the SLA.<sup>65</sup> If we assume 1,000 cremations per furnace this is the equivalent of \$120 per cremation.

FEHD provided details of the staffing operations for its crematoria

*The number of staff to operate the crematorium varies according to the design and number of cremators provided, but normally ranges from 3 to 5 artisans (skilled workers). For the new cremators of free-falling design, 3 more technicians from the EMSTF are stationed on-site to take care of the cremation process. In addition, 2 to 3 unskilled workers are separately provided to work in the service halls and other parts of the crematoria. One Venue Manager (VM) and one Assistant Venue Manager (AVM) are responsible for the overall in-charge for the operation of a crematorium. The total number of staff*

<sup>63</sup> e-mail SK Leung 24 September 2004

<sup>64</sup> Legislative Council (Hong Kong) (2004) *Panel on Food Safety and Environmental Hygiene, Minutes of Meeting*, 19 March, p. 17.

<sup>65</sup> This is an average rate subject to annual review – individual furnaces are likely to require different levels of maintenance reflecting their age.

*managing the six crematoria is 57 (including 14 VM/AVMs, 5 clerical assistants, 22 artisans and 16 unskilled workers) in year 2003. The total staff cost for the 57 staff for 2003-04 was AUD 2.03 million.*

Taking the average across the six crematoria, this implies a labour cost of A\$85 per cremation.

The overall implications of the reported costs for Hong Kong crematoria are that:

- the furnaces recently purchased to update existing equipment are at least ten times more expensive than the typical cost used for Victorian crematoria.; and
- the sum of the maintenance (A\$120) and labour (A\$85) costs alone is only slightly below the adult cremation charge in urban areas (A\$235). Power costs are likely to take the total operating costs closer if not past this charge.

### 6.7.7. Conclusions

The estimates provided for NSW and Queensland crematoria and from overseas suggests that the figures provided for Victoria crematoria broadly are not excessive. This is not to say that a rigorous analysis of costings across the Trusts operations will not identify potential savings.

The charges levied in other jurisdictions also reinforce this point. Jurisdictions with significantly lower charges also tend to be those with vertically integrated operations for which it is difficult to identify where common costs are recovered.

### 6.8. Further Considerations

Obtaining useful operational and financial information regarding Victorian crematoria for the purposes of economic analysis appears to be more difficult than warranted, even with the cooperation of the Department and most Cemetery Trusts. The key reasons for this appear to be:

- Mandated reporting requirements to Treasury & Finance appear to be generic (rather than particular to the death care industry) and the resulting annual reports therefore contain little useful information with regard to operations or service-delivery. Their regular production requires large resources inputs and is seen as a frustrating and time-consuming hurdle with little useful return.
- Historically, a high level of autonomy from government in the management and operation of public crematoria (and associated business lines) by individual Cemetery Trusts, with minimal centralised decision-making or information storage.
- Associated with this, reportedly low levels of industry cooperation between Trusts regarding provision of cremation (and associated services) and a high perception of 'competition'. Industry sources report that this appears to be slowly improving. One positive sign is the commissioning of the CCAV to prepare the *Manual for Victorian Cemetery Trusts*.

Recommendation 2 – That the Government work with the Cemetery Trusts to improve the range and quality of documentary information collected and made available,

including statutory reporting requirements and other less formal reporting. Reporting should include not only probity and public finance requirements but assist in broader analysis and policy development, including business and industry planning. Consideration should also be given to ensuring the scope of required reporting is commensurate with the scale of Trust operations.

The bulk of reporting requirements should remain with the larger Trusts (including those which currently report under the Financial Management Act and others).

Ideally, refinement of reporting would include separation of the larger Trust's major business lines (burial, memorialisation, cremation) to facilitate future economic reviews and management decisions. A few Trusts have undertaken reviews which separate business lines.

Further related conclusions arise with consideration of other jurisdictions. Limited conclusions can be drawn from the available data – these limitations are described in Section 12.1.

Various public and private ownership models for crematoria exist around Australia and elsewhere in the world. However the Victorian model is confirmed government policy and not a subject for this review.

The Victorian death and cremation rates are particular to this State – information from other areas reflects institutional, historical and cultural influences. The Victorian death and cremation rates are considered elsewhere in this report.

Slight regional differences in the cost of labour and power may exist, but it is expected that these are not material.

The most significant difference to other jurisdictions is the ownership and management structure and responsibilities of Victorian crematoria.

- The requirement to fund perpetual maintenance of burial sites is not directly linked to crematoria operations in many other jurisdictions.
- Privately run crematoria do not operate with a 'full-service' approach and consequently would be expected to enjoy lower capital and maintenance costs.
- Price competition is limited in Victoria; competition appears to mainly occur on non-price factors.

Most notably, many of the synergies and advantages of vertical integration enjoyed by some private operators are not available to Victorian Cemetery Trusts; however, the Trusts do benefit from also providing memorialisation products and services.

However, the Trusts are in a potentially strong position, and with good revenue streams, to maximise some of the advantages of government ownership. There currently appears to be considerable scope to enhance efficiencies and quality of service provision through increased linkages. Cooperation on various fronts could reap benefits, taking advantage of common public ownership, including customer/consumer surveys, joint marketing, bulk purchasing, best practice, benchmarking etc.

From discussions with Trust representatives, there appears to be confusion (or at the very least, no common understanding) as to exactly how and why Trusts are competing on provision of cremation (and other) services and even whether this is valuable. There are also a range of attitudes regarding the ‘full-service model’ – i.e. should the focus be on providing a high-quality, full service, or an affordable, ‘competitive’ service?

Recommendation 3 – That the Department support and promote communications within the cemetery sector and with regard to Victorian Cemetery Trusts providing cremation services, in particular. The aim of this is to improve service provision by increasing the synergistic without compromising competitive aspects provided by the current Trust arrangement.

The key relationships that should be promoted include: those with suppliers; competitors (other crematoria); customers (largely funeral directors); and consumers (the public). This could include:

- Discussion and clarification with Trusts of the dual nature of their responsibilities and relationships as competitors.
- Facilitating alignment of strategic aims, for example producing efficiencies in marketing and purchasing.
- Facilitation of information sharing to capture best practice.
- Customer (funeral director) and consumer (public) surveys (and possibly Public Interest Tests), providing information on willingness-to-pay and clarification of Community Service Obligations.



## 7. Fundamental Financial Viability of Victorian Crematoria

### 7.1. Purpose

The purpose of this chapter is to investigate the fundamental drivers of crematorium profitability in Victoria. This assists in a key aim of the project – to examine impact on the industry’s profitability of more Trusts building crematoria.

To allow this part of the investigation to explore a broad range of conditions, we have created a cash flow model for a representative crematorium. This representative or generic model is not dependent on replicating the finances of any particular Victorian crematorium. However its characteristics are consistent with observed practice in the Victorian industry.

The key drivers were identified by undertaking a structured sensitivity analysis of the components of the model for known variations for these components.

### 7.2. Methodology and Approach

We take the following approach:

1. *Development of a generic Victorian crematorium cash flow model.*

The generic model is based on typical costs and revenues reported by cemetery trusts and manufacturers. The most recent data has been used wherever possible, particularly for the major capital items.

The model shows annual cash flows for a crematorium. Capital cost estimates are based on expected capital works programs reflecting asset lives and replacement schedules. Other costs reflect observed operating, administrative and maintenance costs provided by the cemetery trusts. These costs are allocated to the crematorium’s operations in proportion to the contribution toward the cost. In a number of instances, judgements have been made to select this proportion where there is no obvious relationship between cremation activity and the costs.

Cremation revenue is based on current average revenue per cremation (unit revenue) and the number of cremations each year. The same relationship is used for other cremation related revenue.

The model outputs are standard financial diagnostics, i.e. internal rate of return, net present values and accumulated cash surpluses (described in Section 2.2).

## 2. *Examination of scenarios.*

### a. *Variation of throughput, growth and prices.*

Daily throughput for the crematorium is varied to identify the breakeven rate. This entailed using very low to typical maximum daily throughput number of cremations (approximately 1-7 cremations per day).

Within the fairly stable Melbourne market, the number of cremations has increased by around 0.8% pa since 1978. Reflecting the likely long-term bounds of this growth rate we examined growth in throughput between zero and 2% per annum.

Current listed prices for a standard adult cremation are around \$600 to \$700 per cremation. The baseline estimates examined below used \$600 per cremation as an indicative rate. Prices received are varied from \$600 per cremation to \$400 per cremation.

### b. *Variation of several major 'options'.*

The options chosen are major investment and operating approaches observed in Victorian crematoria. They are described below in Section 7.5.

With the progressive addition of additional costs (and revenues), this approach potentially allows us to incorporate ongoing cemetery maintenance costs (PMO), when these are quantified.

This approach provides direct insights into the investment and financial performance of Victorian crematoria, including:

- the profitability of a representative crematorium 'business' in Victoria, and the situation facing a new entrant; and
- the impact of new additional crematoria on the profitability of existing crematoria and the funds available to assist in funding the perpetual maintenance obligation (PMO).

## 7.3. **Generic Analysis – Qualitative Insights**

As questions relating to throughput/utilisation (for existing crematoria and new entrants) are central to the aims of the study, we focus on the relationship between throughput/ utilisation and returns.

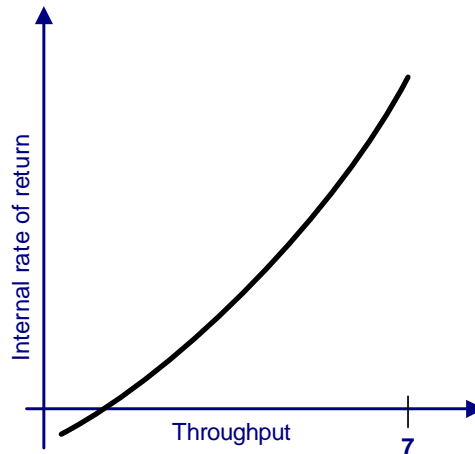
For any given price, the main factor which affects revenue is the average throughput, i.e. the number of cremations processed at a crematorium in a given time period e.g. a day or a year.

Thus, we can plot IRR against throughput measured as average daily cremations. We know the maximum number of cremations per day per unit is approximately seven (assuming a single 8-hour shift, which is the industry standard).

To focus on the main issues and emerging conclusions, it is useful to summarise diagrammatically the main drivers of financial performance under alternative scenarios. This also prevents unnecessary focus on clouding detail.

Most major elements of the cash flow analysis can be summarised by charting the model diagnostics (generally IRR) as a function of throughput, as follows.

**Figure 13 – Relationship between returns and throughput**



We briefly describe the nature and interpretation of the charts, before presenting the results of the various scenarios in more detail.

The main features of this chart are:

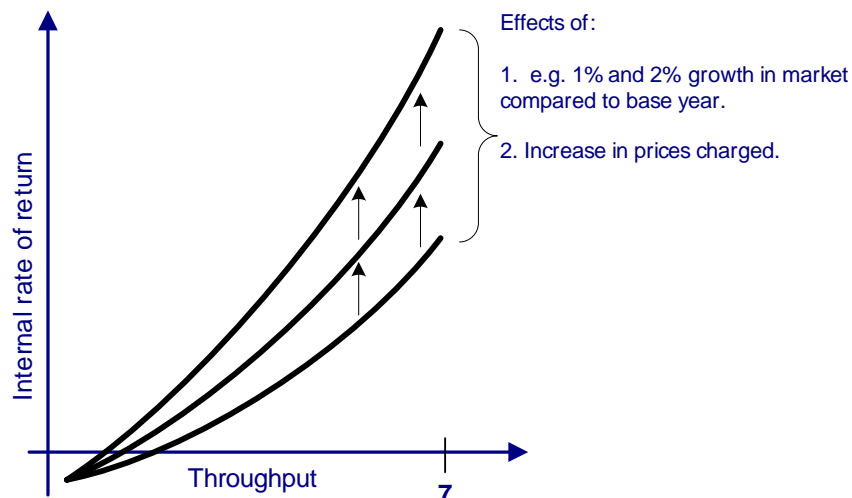
- i. The IRR increases with the **level of throughput**. (Refer Figure 13 above.)

This relationship is shown as the upward sloping line rising from the bottom left hand corner to the top right hand corner of the chart. (At very low levels of throughput, the IRR is negative).

- ii. **Growth of throughput** results in an upward shift in the line. (Refer Figure 14 below.)

The IRR earned is higher where the rate of throughput is higher. In this case, we define throughput to refer to the level of throughput *in a base year*.

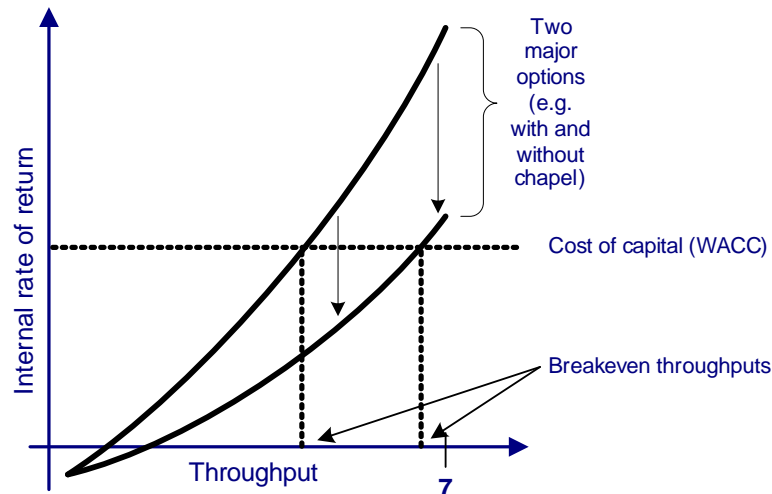
**Figure 14 – Effect of growth and higher prices on returns**



- iii. **Changes in major options/parameters** vary the costs and revenues (and therefore margins and IRR) for any given throughput. (Refer Figure 15 below.)

Some options, however, (such as a new chapel, for example) may make an individual crematorium more attractive thus increasing the level of throughput.

**Figure 15 – Effect of options on breakeven levels**



- iv. **Breakeven throughput levels** can be found, when comparing returns to alternative investments. (Refer Figure 15 above.)

The IRR for any given level of throughput can be compared with the returns earned on alternative investments.

For any specified threshold rate of return (WACC) we can calculate the levels of throughput required under each scenario to meet that threshold rate.

- v. **Changes in the prices** charged for a cremation affect the slope of the line. (Refer Figure 14 above.)

Higher prices result in a steeper relationship, i.e. less throughput is required to achieve any particular level of return, or alternatively for the same throughput, returns are higher at higher prices.

- vi. The **impact of competition** caused by additional trusts investing in crematoria. (Refer Figure 16 below.)

This has several effects:

- a. An initial **increase in overheads for affected existing crematoria** due to their more aggressive non-price competition.

This causes a downward shift of returns earned at all levels of throughput, i.e. the ray shifts downwards.

- b. A **reduction in prices received by all crematoria** as new entrants seek to bid demand for cremation away from the existing facilities.

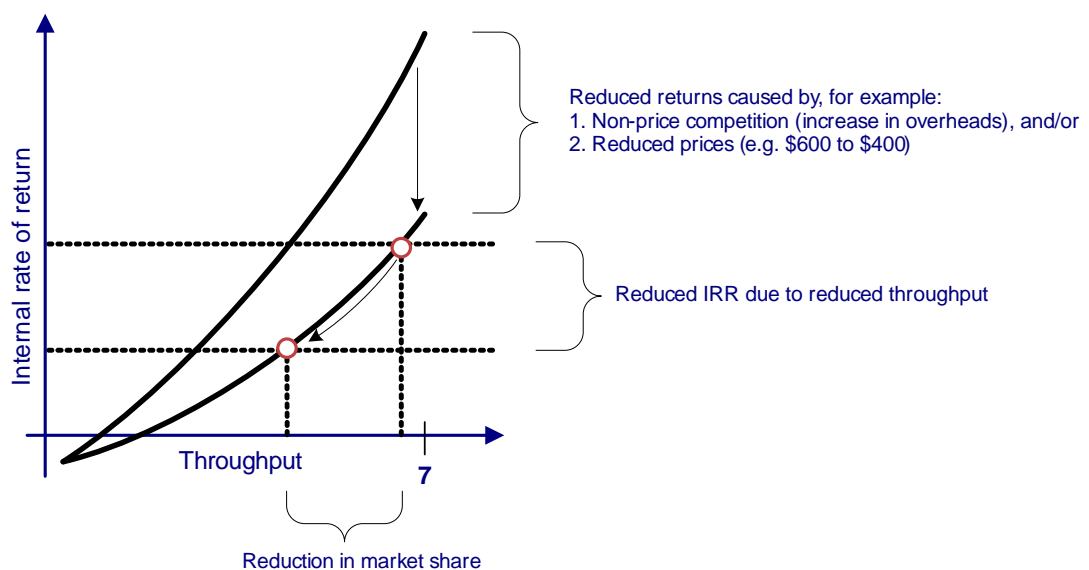
This also causes a further downward shift in the level of returns for any level of throughput.

- c. A **reduction in market share for affected existing crematoria** as demand is bid away from existing to new crematoria.

This causes an inward movement along the (already downward) ray describing the relationship between throughput and returns.

For any given reduction in the level of throughput we can view the change in the IRR, the change in the NPV of the investment or the change in the accumulated cash surpluses of the crematorium.

**Figure 16 – Effects of competition on returns**



In summary, variations on the basic diagram can be used to summarise most of the issues arising from additional investment in crematoria.

The vertical axis is generally shown as the IRR – since different scales of investment are involved, IRR is the most useful comparator between different scenarios.

Our financial and cash flow model of a representative Victorian crematorium provides the basis for quantifying these qualitative insights.

## 7.4. Inputs

The key input figures described in Chapter 6 provide the basis for indicative configuration, costs and revenues for a fundamental analysis of the crematoria industry. These figures are listed in Table 20.

From these we have used indicative figures to provide a robust basis to examine the key elements of crematoria profitability. The figures also allow analysis of potential crematoria without relying on the configurations found in individual crematoria. As such the analysis is based on a “new” crematorium that begins operating in 2003 and is fitted out in the previous year. The crematoria are assumed to continue as “full service” operations, viz they will provide same day service, options for a committal service at a chapel at the crematorium and options for memorialisation.

### Operating Parameters

In all cases, the crematoria are assumed to work one shift per day over five day working weeks for 252 days per year. The cremator units are assumed to have a capacity of seven cremations per day.

The actual scale of the operation is left to scenario analysis at the time but configurations of one, two and three cremators are likely to cover most instances of future crematoria.

### Costs

There is a range of costs reported for gas, electricity and other volume related costs for the nine crematoria. Most reported gas and electricity costs of around \$20 per cremation. The highest reported were from Traralgon (which uses bottled gas) and Springvale which reported significant recording and reporting costs associated with each cremation. For the indicative model we have used the higher range of costs – for brevity we have used the Traralgon figures and omitted the separate line for other volume related costs.

Wages and on-costs primarily reflect the scale and throughput involved. For the regional crematoria and smaller scale metropolitan crematoria (Altona, Bunurong and Lilydale) wage costs range between \$40,000 and \$130,000. Most crematoria use crematorium staff as extra gardeners and for memorialisations. As a result, the actual wage cost attributable to cremations is likely to be overstated by these costs. As a compromise, we have used a wage cost of \$60,000. This is likely to overstate the cost for lower throughput crematoria and understate it for high throughput crematoria. For crematoria with more than two cremators running, it is likely that a supervisor would be required.

Most crematoria do not have a detailed analysis separating the cremation business. As a result, separate information on costs associated with maintenance and repairs of cremators, crematorium buildings, related equipment and allocated overheads varies in quality and comparability. A similar concern occurs for the replacement of equipment and buildings. For the purposes of generating indicative cost estimates we have examined the key elements associated with cremation. As a result, we have been informed by both the accounts of the cemetery trusts and tender information from manufacturers on expected costs of running a crematorium. Given the consistency of approach, the latter have been used as a strong guide in evaluating likely costs.

The major equipment costs associated with cremation are the purchase of a cremator unit, its maintenance and periodic rebricking. The cost of a cremator unit varied between over \$200,000 to over \$400,000. Most were around \$250,000. As a base case, we have used \$235,000 as the replacement cost of a cremator.

Some cremator units are replaced regularly; some are almost never replaced.<sup>66</sup> A number of crematoria did not report the costs of rehearsing – it is likely these possibly regular costs were part of the cremator unit annual maintenance. Rebricking of the hearth and full rebricking are however important and identifiable costs associated with cremation. We have relied on the reported levels and from the tenders to guide a policy of rehearsing every 3,500 cremations at a cost of \$7,500; fully rebricking every 7,000 cremations at a cost of \$45,000; and replacing every 14,000 cremations.

Administrative costs were set at \$50,000. Necessary ancillary equipment for cremation includes a processor, pans and a trolley. It is likely that a crematorium established today would also purchase a charging bier. These sum to \$63,000 and an additional \$24,000 has been allocated for a cool room. As noted above, there is a variety of maintenance and replacement approaches used by the crematoria. Most of the smaller crematoria maintain existing equipment and may in fact never replace. To account for this approach a high level of maintenance is assumed, and set at 5% per annum of the purchase value. This value was also applied to the cremator units, reflecting other maintenance that was reported.

Finally, we have used the costs of buildings in regional crematoria as a best guide to the minimum standard for a new concern. There is little doubt that significant extras can be built into new chapels. However, for the purposes of establishing primarily the returns to cremation, we have used a crematorium cost of \$110,000 and a chapel cost of \$220,000 as the base case. Reflecting the observed propensity to invest significant sums into chapels, we have also examined the implications of a larger chapel, costing \$500,000.<sup>67</sup>

## 7.5. Range of Scenario Analysis

For the purposes of scenario analysis, we have tested throughput through the range of 0.5 to 6.5 cremations per working day.

In expressing throughput, we have generally used ‘per day’ as the unit of measurement, as apposed to ‘per annum’. This unit is easier to relate back to other factors such as overtime and capacity, which are more readily expressed in daily rather than annual rates. By using 0.5 cremation increments we can obtain a better representation of the relationship between throughput and returns. If ½ cremations are conceptually difficult, then it represents one cremation every two days.

However it is also sometimes useful to discuss throughput in annual rates for comparison with industry figures. Table 27 shows equivalent annual rates. We have assumed 252 working days per annum.

**Table 27 – Throughput levels conversion**

<b>per day</b>	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5
<b>per annum</b>	126	252	378	504	630	756	882	1008	1134	1260	1386	1512	1638

<sup>66</sup> A unit in Hobart was removed after almost 50 years with “a tap from hammer”.

<sup>67</sup> There may be a case for further doubling of this figure. Conversations at Fawkner suggest that to meet the needs of large attendance at committal services, chapels with a capacity of over 100 may be necessary. Such a building may represent a multi-million dollar investment.

## 7.6. Definition and Description of Scenario Parameters

The purpose of modelling the representative crematorium is to investigate and understand how changes in the major cost and revenue drivers affect the returns and cash surpluses earned.

We explore these drivers through variation of key parameters.

### 7.6.1. Major Victorian cremation industry parameters

Through interviews with key industry contacts, we have identified a number of parameters which may drive costs and revenues in the Victorian crematorium industry. We have also identified the likely range of values that could be expected for these parameters. These parameters are listed in Table 28 below, along with the variations of their values used in the scenario analysis.

**Table 28 – Parameters for scenario analysis**

Parameter	Range of values
Requirement for new cremator building	With (\$100,000), without
Number of cremator units	1, 2, 3
Size of cremators (cremator throughput)	Low volume, high volume
Chapel	With, without
Chapel size	Standard (\$220,000), large (\$500,000)
Chapel service rates	Low (33%), high (67%)
Memorialisation included	With, without
Memorialisation rate	Low (17%), high (33%)
Demand growth (per annum)	0%, low (1%), high (2%)

These parameters are defined and described in more detail below. The most common and most likely combinations of these parameters are then detailed in Section 7.7 below.

#### Requirement for new cremator building

Cremator units must be ‘housed’ in a building which is usually purpose-built.

Such buildings are often constructed with spare capacity, i.e. with room to house 1-3 more cremator units than are planned to be installed at the time of building, to allow for future expansion. This is because the cost of additional space is minimal compared with the cost of building extensions or new buildings at a later time.

In our modelling, we assume buildings are constructed with room for two cremator units at a later time. Recent estimates of building costs suggest costs in the order of \$100,000 are appropriate.

Additional expenditure on building is primarily an upfront cost often associated with the building of the chapel. The effect of spending more on buildings is subsumed within the large chapel option.

A new building must be constructed for new cremator units, and associated costs accounted for in the modelling, in two distinct circumstances:

1. For an existing crematorium which has no ‘spare capacity’ in its existing buildings for additional cremator units.
2. For a new crematorium site.



### Number of cremator units

Crematoria range in size from single cremator operations housed in common buildings up to five cremator operations in purpose-built facilities. To represent this range we have undertaken scenario analysis for 1, 2 and 3 cremator unit crematoria.

### Size of cremators (cremator throughput)

A range of types of cremators exist, of varying manufactures/brands and models.

The primary financial effect of size is seen in the replacement rates (rebricking, rehearthing, replacing).

### Chapel

Victorian crematoria have chapels for ‘committal services’ prior to cremation (as an alternative or in addition to memorial services, for example at a funeral parlour). These provide the option to undertake services at the cemetery which attract a higher fee.

### Chapel size

A range of types of crematorium chapels exist, with varying levels of ‘bells and whistles’. These chapels may be integral to the crematoria buildings.

To represent the range of expenditure on these chapels we have broadly identified ‘low’ and ‘high’ cost chapels.

### Chapel service rates

The proportions of cremations that have associated chapel services at the crematorium varies significantly between Victorian crematoria.

For simplicity, we have categorised service rates as low and high.

### Memorialisation included

The revenues (and costs) associated with memorialisation of cremated remains is a significant aspect of a cemetery trust’s finances.

This technically lies outside the scope of this project.

However, trusts which operate crematoria enjoy significantly higher levels of memorialisation of cremated remains, due to their close physical and operational association with cremation.

Therefore, we included in the modelling, as an option, the potential financial effect of memorialisation.

### Memorialisation rate

Following on from the inclusion of memorialisation revenues (and costs), we have included low and high options for the memorialisation rate. This is defined as the proportion of cremations, at a particular cemetery trust’s crematorium, which are additionally memorialised at a cemetery associated with that trust.

## Demand growth (per annum)

Growth in demand, from a particular base year, is modelled at nil, low and high levels (see chapter on growth in demand for further discussion).

Over 48 years from 2003 to 2051, the modelled annual increase in demand of 1% and 2% equates to a 61% and 159% cumulative increase respectively.

### 7.6.2. Differences between metropolitan and regional scenarios

There exists some differences between costs, equipment choice and other parameters between metropolitan Melbourne and Geelong, and regional locations.

From interviews with industry contacts, we have identified the significant differences between the metropolitan and regional situations.

For simplicity and clarity of scenario modelling, where possible and appropriate we have broadly categorised some of our parameter values as ‘metropolitan’ or ‘regional’.

This is summarised in Table 29 below. Where there is no pattern of difference, this is indicated by a dash. In the scenario analysis, this indicates that all values are investigated.

**Table 29 – Metropolitan and regional crematoria modelling assumptions**

Parameter	Metropolitan	Regional
Requirement for new cremator building	–	–
Number of cremator units	–	–
Size of cremators (cremator throughput)	High volume	Low volume
Chapel	–	–
Chapel size	–	–
Chapel service rates	Low (33%)	High (67%)
Memorialisation included	–	–
Memorialisation rate	High (33%)	Low (17%)
Demand growth (per annum)	–	–

### 7.6.3. Scenario terminology

We use the following abbreviations to simplify the discussion of various scenarios, as shown below.

**Table 30 – Scenario symbols**

Symbol	Meaning	Meaning if omitted
1, 2, 3	1, 2 and 3 cremator units	n/a
B	New cremator building required	No cremator building required
R	Regional assumptions	Metropolitan assumptions
C, CL	Standard chapel, large chapel	No chapel
M	Memorialisation included	Memorialisation not included
G0, G2	0%, 2% growth per annum	1% growth from base year
x5, x4	Scaling of representative figures to give a notional industry figure	Relates to a representative crematorium

The regional and metropolitan assumptions referred to are detailed in Table 29.

For example:

- Scenario '1RCG<sub>2</sub>' would be modelling the addition of a low volume cremator unit and a standard chapel to a crematorium which already has sufficient buildings to house the cremator. The effect of potential additional memorialisation is not be included, and growth at 2% p/a is assumed. The regional assumption on chapel service rate of 'high' (67%) is used.
- Scenario '4BM' would be modelling the building of four new high volume cremator units and associated building (with capacity for two additional units at a later time), and inclusion of additional memorialisation revenues at a 'high' rate (33%). No chapel is included, and 1% growth is assumed.

## 7.7. Scenario Selection

From the wide range of potential scenarios raised by the parameters listed in the previous section, we now select several scenarios based on the most common (and most likely) configurations in the context of the Victorian cremation industry. Table 31 gives an overview of the scenarios modelled in further sections.

**Table 31 – Scenario modelling overview**

Scenarios	Description
1R	The cremator is housed in existing buildings. No building costs, no chapel, no memorialisation included. No crematorium in Victoria operates under this configuration, but this simulates the effect of adding a cremator to an existing facility.
1BR	We examine the sensitivity of crematorium viability to building costs. There is no chapel, nor is memorialisation included. Again, no crematorium in Victoria currently operates under this model. However, privately run crematoria interstate approximate this approach.
1RBC 2RBC 3BC	This configuration includes the costs of cremator buildings and standard chapel. This allows a review of the incremental impact of this common element to Victorian crematoria.
1RBCM 2RBCM	This configuration includes the financial effect of memorialisation of cremated remains. This reflects common practice in Victoria and the configuration is indicative of regional crematoria.
1RBCLM 2RBCLM 3BCLM	To reflect a greater service-oriented approach, we have allowed a larger upfront chapel expenditure. This situation replicates some of the higher cost metropolitan crematoria and/or the effect of non-price competition.
1RBCM ×5 2BCM ×4	Using representative crematoria configurations, we investigate implications of price competition and cannibalisation on industry returns and viability.

## 7.8. Scenario Results

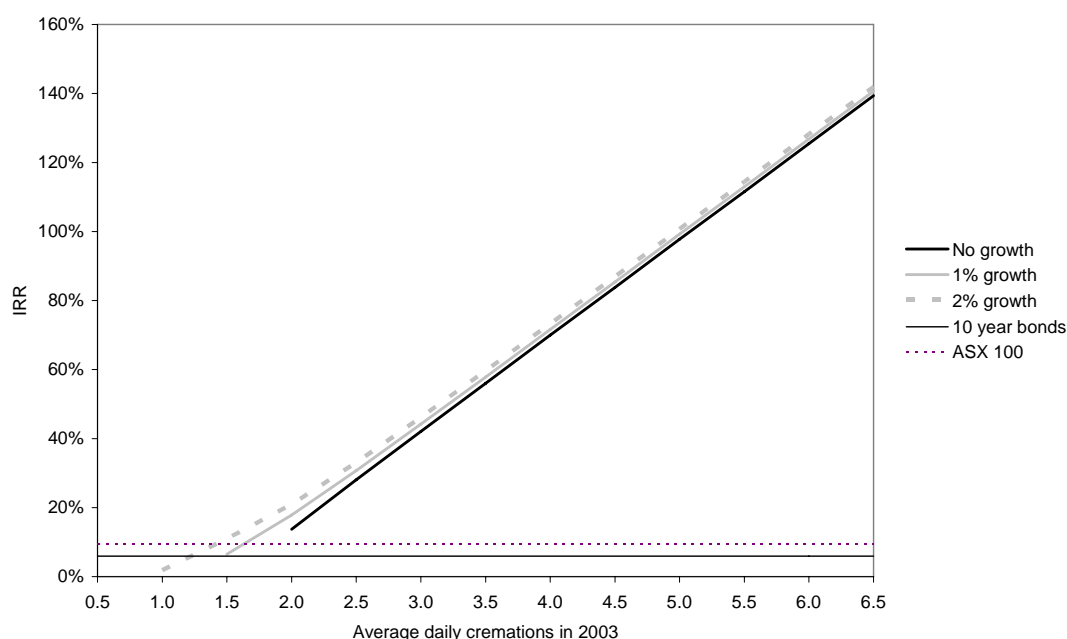
### 7.8.1. Market growth

The first variable that was examined was the impact of different annual growth rates. The rates of growth examined (0, 1%, 2%) are consistent with population growth in most established areas. The mid range (1%) is broadly consistent with average growth in cremations in the relatively stable Melbourne catchment (0.8%).

Variation in the growth rate had little effect on rates of return under scenario 1R – this is shown in Figure 17. This result was also seen with subsequent scenarios. These are not shown.

In contrast, as represented by moving along each curve, significant shifts in demand, from say cannibalisation or shifts in community attitudes to cremation, will significantly affect returns to an operator.

**Figure 17 - Scenario analysis - growth rates**



Based upon this analysis, we consider that the likely variations from the average annual growth rate will have minimal effect on returns to the industry. We therefore only use 1% pa growth as the indicative rate in further scenarios.

### 7.8.2. Single cremator

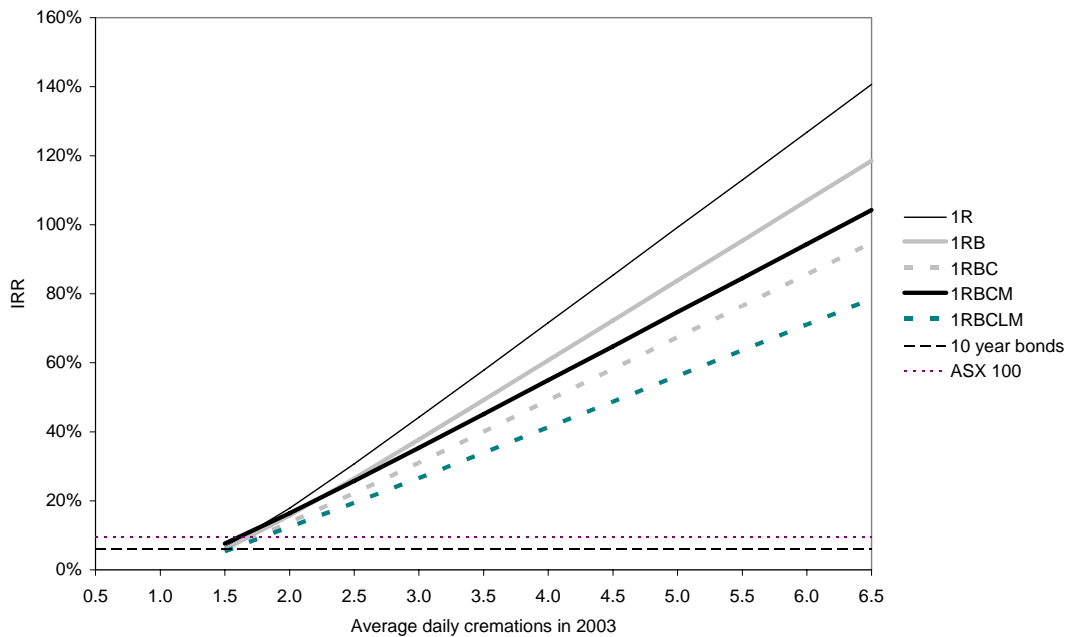
We now explore single cremator scenarios. As single cremator operations are typical of regional crematoria we have limited the analysis to regional parameters (rural/low volume) as listed in Table 32.

**Table 32 – Single cremator scenarios**

1R
1BR
1BRC
1BRCM
1BRC <sub>L</sub> M

The relationship between returns and alternative configurations is shown in Figure 18.

**Figure 18 – Single cremator (rural / low-volume)**



The impact of alternative configurations is significant. For example, the need to construct a purpose-built cremator building (1RB) reduces the IRR by approximately 6 percentage points at utilisation rates of approximately 3 cremations per day. Similarly upfront costs associated with chapels (large and small) do not appear to be recouped.

As also shown, when effects of memorialisation are included (compare 1BRCM with 1BRC) returns are significantly higher.

These relative impacts were observed across the different scale configurations. i.e. for two and three unit crematoria.

## 7.9. Breakeven Analysis

We then conducted further analysis using these configurations to determine the initial throughput level to meet investment criteria.

We used the ASX 100 Accumulation Index as the hurdle rate which provides a conservative estimate of this breakeven level.

The first column in Table 33 lists the breakeven cremation rate in 2004 based on a hurdle rate and a price of \$600 per cremation. The table also lists the rate of return at cremation rates of 3 and 6 per day.

**Table 33 – Returns and breakeven levels for specified hurdle rates at \$600 per cremation**

Scenario	Breakeven throughput at ASX 100 Accumulation Index rate	IRR	
		(cremations per day)	3 cremations per day
<b>Single rural cremator</b>			
1R	1.6	44%	127%
1BR	1.7	38%	107%
1BRC	1.7	31%	86%
1BRCM	1.6	35%	94%
1BRC <sub>L</sub> M	1.8	27%	71%
<b>Two rural cremators</b>			
2BRC	1.8	26%	69%
2BRC <sub>L</sub> M	1.9	23%	60%
<b>Three metro cremators</b>			
3BC	2.0	20%	55%
3BC <sub>L</sub> M	1.9	21%	54%

The effect of alternate configurations of the crematorium is significant.

Against the ASX 100 Accumulation Index rate, the breakeven level of throughput is low for all configurations examined. The estimated breakeven levels of throughput are tightly banded ranging from 1.6 to 2 cremations per day (or 420 to 480 per annum). For all configurations considered, breakeven is achieved at throughputs less than 50% of standard operating capacity.

However, if the price for cremation were to be reduced to, say, \$400, then the breakeven levels of throughput would rise accordingly.

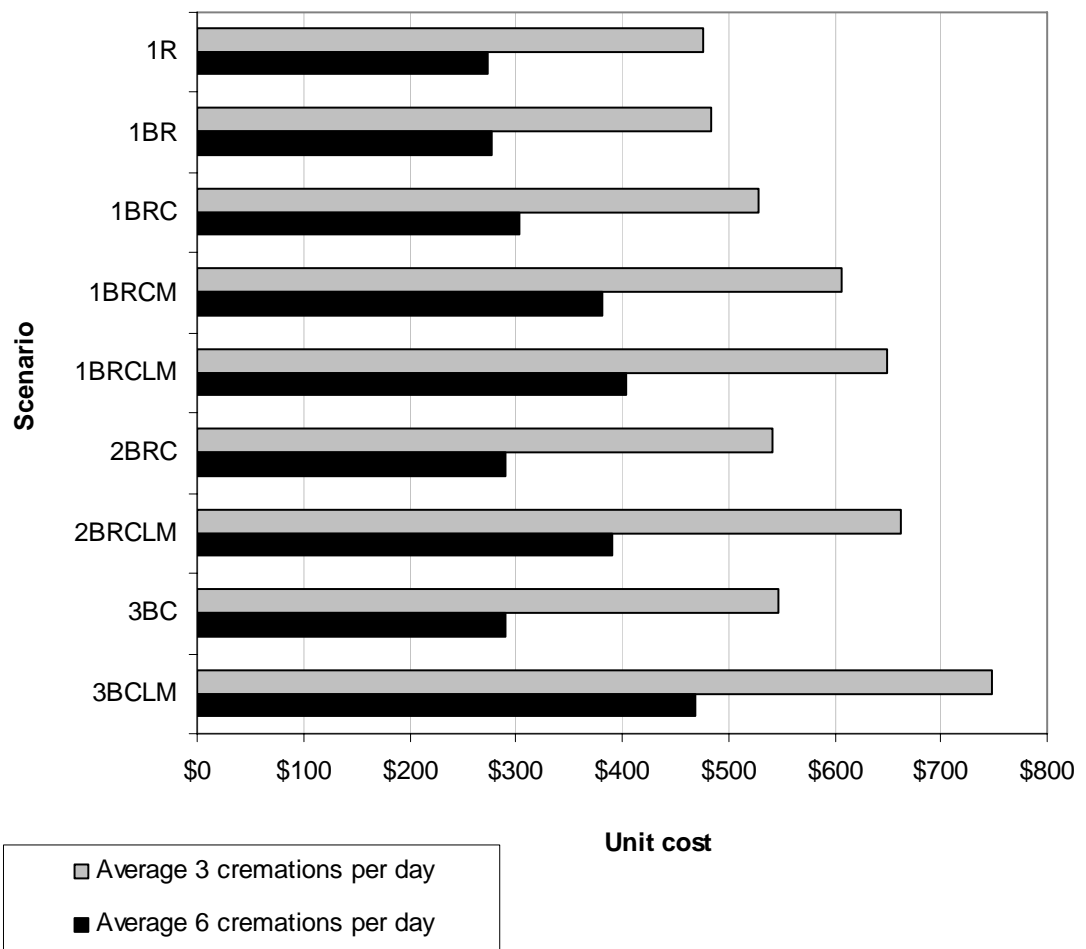
## 7.10. Unit Costs

Our analysis shows the significant effect of throughput on returns. This is mainly the effect on unit costs.

Across the various scenarios, there is little relative difference in unit cost at any particular throughput level. For both three and six cremations per day, unit cost varies by approximately 40% for the one and two cremator unit scenarios.

As demonstrated by Figure 19 below, the effect of cannibalisation of market share (e.g. the difference between six and three per day) is to almost double unit costs.

**Figure 19 – Unit cost for different scenarios**



## 7.11. Other Insights

### 7.11.1. Insights from examining cash balances

The rates of return shown in the above section indicate that crematorium investment is likely to be profitable at low levels of utilisation. However, particularly for private entities where there is a significant upfront investment, a project must be able fund itself in a reasonably short time frame. This is referred to above as ‘bankability’.

Figure 20 shows the net cash balances for throughputs of 1.5, 3 and 6 cremations per working day for the 2BRC scenario. The crematoria struggles to generate sufficient cash flow to achieve a net cash balance where it starts with only 1.5 cremations per day. However, with 3 per day it is likely to accumulate almost \$100m by 2051 and significantly more with 6 cremations per day (still under 50% of its capacity).

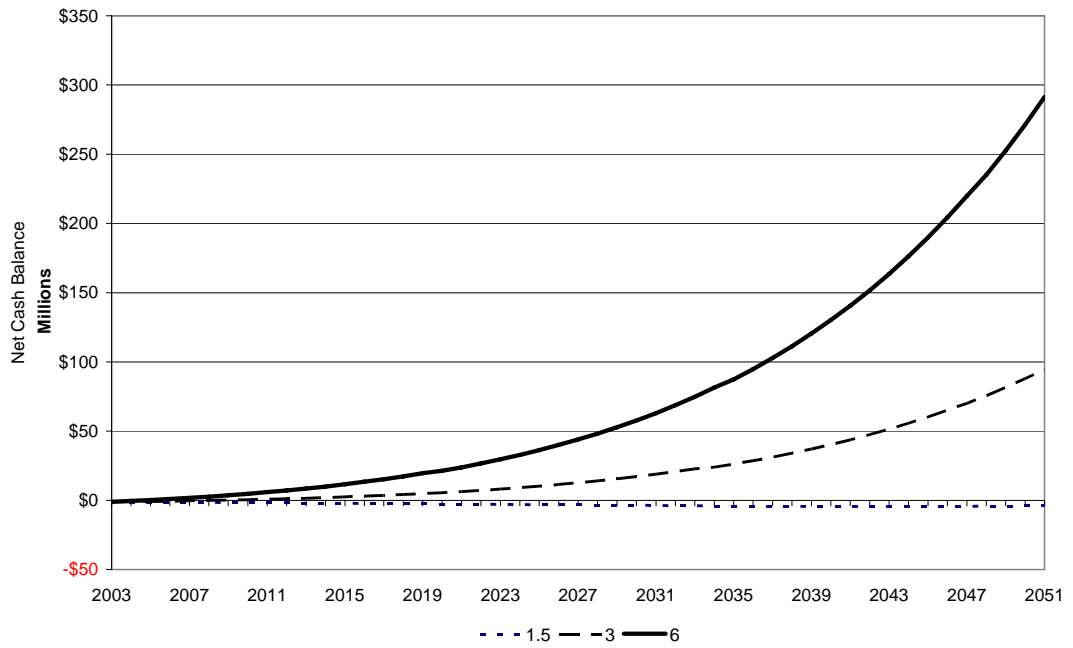
Panel B shows the same picture but includes two daily cremations (and excludes 6). An extra (average) half cremation per day is sufficient to generate significant additional returns. This highlights the ‘knife edge’ between an unviable and a viable crematorium investment, due to throughput.

This also highlights the issue of bankability. Over the life of the analysis, the two cremator operation achieves an IRR of almost 12%. Of itself, this would suggest that investment in the crematoria is worthwhile. However, as the figure shows, the operation does not achieve a positive cash balance until 2020. As a standalone operation, this would be unviable. As it is, the trust would be required to fund the shortfall until well into the second decade of operations.

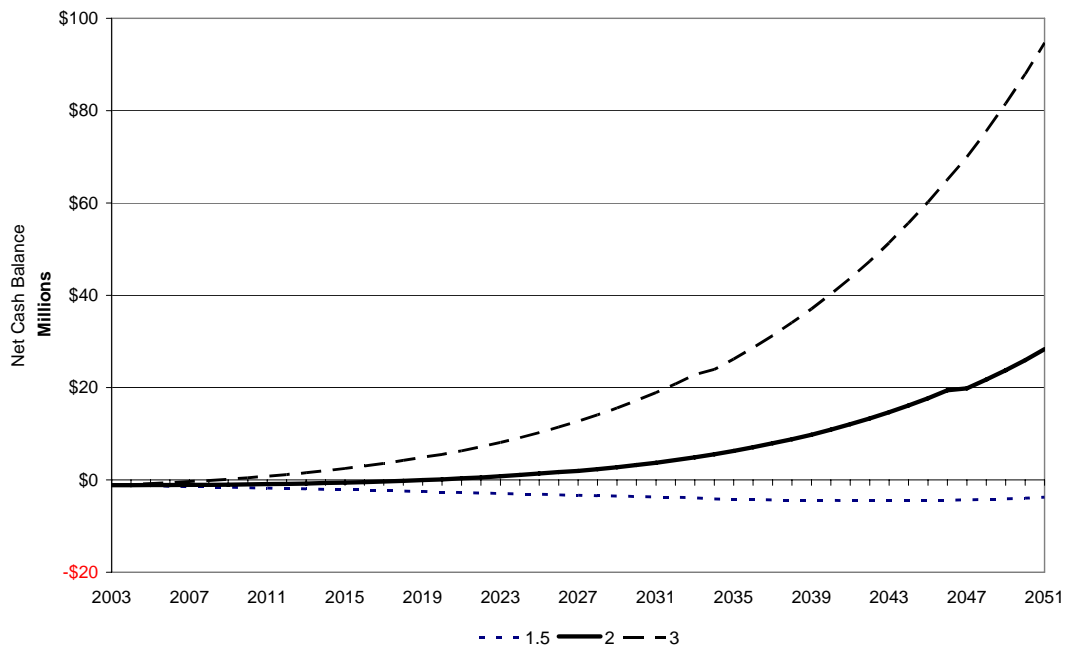


**Figure 20 – Cash balances for two cremator operation**

Panel A



Panel B



### 7.11.2. Scale of operations

It is important to identify operational and financial differences between multiple cremator units and multiple crematoria sites.

It is trivial to observe that a single site with two cremators will operate with lower average costs than if the cremators were located in the two crematoria. This is so primarily because:

- each crematorium will generate its own administrative overheads;
- there are economies in building one crematorium to house two cremators versus two buildings.

These apparent economies of scale provide operational and financial reasons to centralise and concentrate operations (i.e. moving towards the ‘factory’ approach).

Further, because of the large fixed costs, there are significant economies of utilisation. i.e. Returns increase significantly as throughput approaches capacity.

In addition, housing two cremators together provides greater operational flexibility in cases of breakdown and major repairs and maintenance.

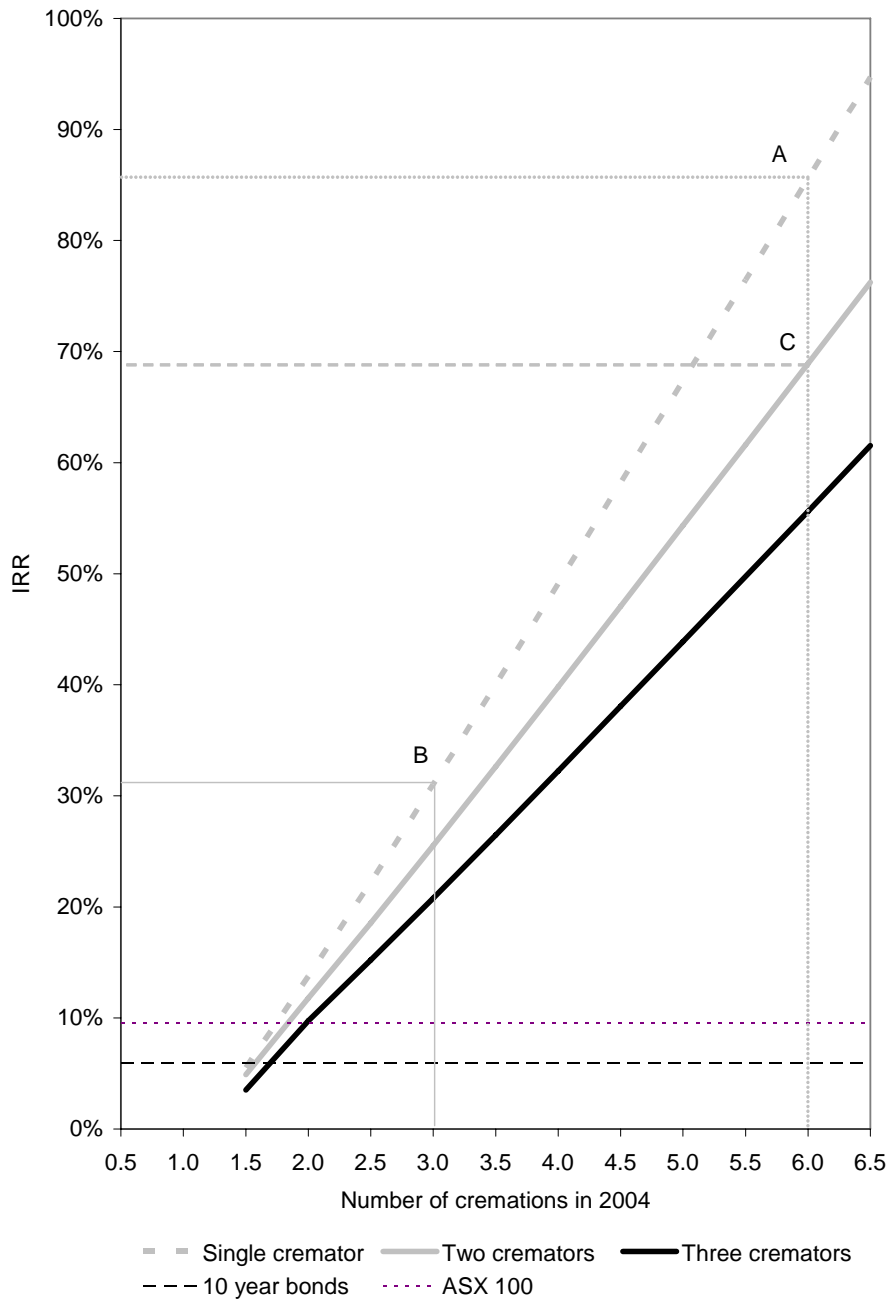
Contra, more crematoria will be of advantage, primarily to meet demand expectations – it is more ‘attractive’ to use a local crematorium than a distant one. Such benefits become apparent with higher demand, i.e. when unmet or latent demand is picked up.

For these reasons, we have examined the financial impact of two cremator units located at two crematoria sites versus the two units being located at a single site. This also provides an analogy for the effect of entry.

We have examined these alternatives at the decision point of purchasing a second cremator unit. This is with throughput levels close to the expected capacity of a single unit, i.e. approximately six cremations per day.

At an expected throughput of 6 per day, expected returns for a newly established single unit crematorium are over 85% (Point A, Figure 21). If the market is equally shared (Point B), each single unit crematorium would earn slightly over 30% per annum. In contrast, if the sole crematorium was established with two cremator units, its return would fall to slightly under 70% (Point C).

Figure 21 – Effect of entry/expansion



A similar impact is observed at lower cremation throughput as is typical of most Victorian crematoria.

For a single crematoria operating one unit with average throughput of three per day, expected returns are approximately 31%.

If a second operator entered and they equally shared the market, each operator would only make around 5½% on their investment. Were the first operator to bring in a second cremator, its returns would fall to around 25%.

## Effect on cash balances

The effect is more stark if we consider the amount of cash generated by each operator.

If a Trust had invested its initial cash outlay in government bonds (instead of a crematorium), it would have accumulated over \$10m (one cremator), \$14m (two cremators) and almost \$18m (three cremators) over the period of analysis (to 2051).

The sole crematorium running a single unit would generate almost \$90m by 2051 with throughput averaging 6 per day. In contrast, two crematoria each running one unit would generate \$35m. In effect, around \$20m has been lost due to lower average throughput in each crematorium.

The single cremator operator (three cremations per day) would achieve cash balances of approximately \$35m by 2051. With two cremator units, the single operator will still achieve very similar cash balances. However, two operators sharing this market are likely to generate only \$5m each or \$10m in total. This represents \$14m lost to the industry.

This is a *minimum* impact of entry because no price competition is assumed.

## 7.12. Interstate Operations near Victorian Border

The ability to generate viable cremation operations from low throughput is confirmed by examples of interstate crematoria operating near the Victorian border.

These crematoria generally operate closer to the ‘factory’ approach, with fewer value-added services. They also operate in a quite different regulatory environment.

By way of example, smaller NSW cremators near the Victorian border operate with throughputs under the thresholds identified in Table 33. Victoria is a significant market segment for most of these crematoria (as indicated Table 34 below).

**Table 34 – Interstate crematoria near Victorian border**

<b>Crematorium</b>	<b>Ownership</b>	<b>Cremator units #</b>	<b>Throughput (approx. annual)</b>	<b>Victorian throughput (approx. %)</b>
Dareton, NSW (near Mildura)	Wentworth Shire Council	1	?	?
Moama, NSW (near Echuca)	James Ferris Funerals	1	155	80%
Albury Crematorium, NSW	Albury City Council	1	398	60%
Avondale Crematorium (Albury), NSW	Funeral director	1	300	5%
Mount Gambier Crematorium, SA	City of Mount Gambier	1	225	50%

## 7.13. Industry Level Perspective

### 7.13.1. Characterising and modelling Victorian cremation operations

The scale of operations in the Victorian crematoria industry is relatively diverse. Operations range from small regional operators with one cremator undertaking 500-600 cremations per annum to large purpose-built metropolitan facilities with 4-5 cremators undertaking 5,000-7,000 per annum.

To facilitate an industry perspective, we have characterised the existing industry of 21 cremator units as serving two basic areas:

- **Regional** – five cremator units across five regional crematoria will supply the regional throughput.
- **Melbourne metropolitan** – 16 cremator units across eight crematoria are modelled to supply the Melbourne metropolitan throughput.

This simple dichotomy captures much of the variations across the crematoria. Whilst greater accuracy could be achieved with the generic model, this level of analysis is better applied to the individual crematoria models.

The model will provide a beneficial first step with insights into the orders of magnitude that arise in examining major structural changes in the industry. In particular, we have examined two major changes: the impact of price competition, and cannibalisation of market share.

The generic model is based on new crematoria. It therefore underestimates the quantum of benefits to existing operations where there are existing assets that do not require significant funding. However importantly, in examining the net impact of the changes outlined, the differences between new and existing crematoria are not material. The changes affect the returns from future operations and are less dependent on the starting point.

### 7.13.2. Modelling base case

The situation of the pre-existing Victorian industry can be approximated by combining the representative models outlined in preceding sections.

Both the regional and metropolitan modelling is based upon a “full service” crematorium (memorialisation and a small chapel allowing services).

For regional modelling, a single low-throughput cremator was used. For metropolitan modelling, two high-throughput cremators were used. In both cases activity was based upon average throughputs for the regional and metropolitan areas in the base year (513 and 1,009 cremations respectively). An annual growth rate of 1% was used. Unit revenues of \$600 were assumed for both regional and metropolitan models.

Table 35 shows the returns across the industry for the base case modelling.

**Regional crematoria** achieve an IRR of approximately 16% over the modelled period (2004-2051). The NPV of the investment averaged \$2.5m and accumulated cash balances of \$42m were obtained by 2051. This is equivalent to an NPV of just under \$10m and an accumulated cash balance of \$166m in 2051 for all regional crematoria.

**Metropolitan crematoria** achieve significantly higher returns: an IRR of 44%, an NPV of \$11m and accumulated cash balances of \$190m. Reflecting the greater size of the metropolitan sector, this results in total NPV and accumulated cash balance well above that for regional crematoria.

As an industry, crematoria will, on these assumptions, generate over \$1.5 billion by 2051 toward the industry's reserves to meet the PMO.

**Table 35 – Modelling base case**

	Individual			Total		
	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)
<b>Regional</b>	16	2.5	42	16	10	166
<b>Metropolitan</b>	44	11	190	44	91	1,523
<b>TOTAL</b>					101	1,688

From this base case, we proceed to examine the impacts of price competition and cannibalisation of the market.

### 7.13.3. Effects of competition

The returns obtained by a trust from its crematorium reflect the margin received per cremation and the number of cremations performed. As throughput rises, this margin increases. Trusts are well aware of the need to increase volumes and to protect existing throughput.

Existing trusts (with crematoria) have a limited capacity to compete. The trusts are able to earn significant monopoly rents (profits above the normal rate of return for their level of risk) with their markets reasonably well-defined on a geographic basis.

Under these conditions, we would predict competition for greater market share will focus on non-price elements, such as the range and quality of services (chapel, memorialisation, funeral director and clergy refreshment rooms, same-day service, etc.) or building relationships with their direct clients, the funeral directors, including the infamous transportation service provided a few years ago.

The benefit for the trusts is that this type of competition does not typically significantly erode their margins. It is also probable that they are not significantly eroding each others' volumes (competition for the 'margin' rather than the 'heartland').

This will not be the case where an entrant appears within an established catchment. Even without reducing prices, an entrant will cannibalise an incumbent's heartland, due to locational advantages such as reduced travel time. As this will have a direct impact upon returns there will be significant incentive to engage in price competition to maintain and recover any major loss of market share. An alternative response has been seen in a major Victorian trust, which "accepted" entry and reduced the scale of its operations dramatically from 10 cremators to five.

Therefore, competition may manifest in two ways which affect the rate of return of crematoria:

- proximal/local crematoria stealing customers ('cannibalisation' of demand); and
- price competition leading to reductions in price.

### Cannibalisation of demand

Crematoria located in proximity to each other will have the effect of reducing throughput to each crematorium (demand is 'cannibalised'), even if total industry throughput is increased.

This has the effect of reducing margins (i.e. increased costs compared with revenues) for each crematorium. As larger (multi-unit) sites are more efficient than separate sites, this may have the effect of reducing profits for the industry as a whole.

*Critically, in both cases the total dollar returns across the Victorian cremation industry will fall. There will be less available for the trusts' PMOs.*

The effects of cannibalisation and price competition on returns may be summarised as follows.

**Figure 22 – Summary of effects of cannibalisation and price competition**

		New entrants cannibalise existing demand	
		No	Yes
Price competition	No	Highest returns	Lowered returns
	Yes	Lowered returns	Lowest returns

Recognition of these two separate effects underlines the distinction between:

- restricting entry by adopting an industry wide investment framework; and
- allowing entry, but disallowing price competition.

In the absence of effective action by government, these several inevitable forces will create major pressures on individual trusts and also the ability of Victorian cemetery trusts collectively to fund the aggregate cost of these perpetual maintenance obligations.

### 7.13.4. Effect of Price Competition

From the base case, we have simulated price competition by examining the impact of a small price fall (reducing prices by \$100) and a large price fall (reducing prices by \$200) for both regional and metropolitan crematoria.

Impacts on regional crematoria are expected to reflect the flow-through of any price reductions through the industry. We do not consider that price falls could be quarantined to one area.

The capacity to lower prices is determined by each crematorium's unit costs. As identified above, these costs vary significantly with throughput and the configuration of the crematorium. Large crematoria in the metropolitan area could expect unit costs to be of the order of \$300. This provides scope to drop prices probably by up to \$200. There is likely to be far less scope for regional crematoria to match these declines, and a \$100 price reduction or less may be more realistic.

Thus, the greatest scope for price falls is in the metropolitan area where competition will be more proximate and intrusive.

Crematoria with significant established assets are better placed to engage in cutting prices in the short-term where variable costs are low. For this reason, we have modelled both \$100 and \$200 price reductions across regional and metropolitan crematoria.

## Results

As noted above, regional crematoria are assumed to be unaffected by cannibalisation. However, as evidenced by their low level of return, they are susceptible to changes in returns from lower prices.

In particular, price falls of around \$200 will result in below market returns (model is based on a new cremator) and the loss of the modelled \$10m NPV and \$45m in accumulated balances for each crematorium. Across all regional crematoria, over \$5m of value would be lost with a small price fall and \$11m from a large price fall.

**Table 36 – Regional Effects of Price Falls**

	Individual Rural Crematorium			Total Rural		
	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)
<i>Base case</i>	17%	2.5	42	16%	9.9	166
<i>Small price fall</i>	10%	1.1	18	10%	4.4	74
<i>Large price fall</i>	5%	-0.2	-5	5%	-1.1	-19

The impact of price falls on the metropolitan crematoria is significant, albeit not a threat to solvency in the short-term as it would be in the case of regional ones.

The small price fall will cut around \$2.5m from each cremator unit's NPV and \$45m from final cash balances. Across all metropolitan crematoria, there is a reduction in the NPV of around \$21m and in cash balances of over \$350m. Broadly, both the NPV and accumulated cash balances fall by one-quarter under the small price fall and are almost halved under the large price fall.



**Table 37 – Metropolitan effects of price falls**

	Individual Metropolitan			Total Metropolitan		
	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)
<i>Base case</i>	44%	11	190	44%	91	1,523
<i>Small price fall</i>	35%	9	145	35%	69	1,159
<i>Large price fall</i>	26%	6	100	26%	48	796

### 7.13.5. Effect of Cannibalisation

Whilst entry is possible in both the metropolitan and regional markets, the impacts of each are likely to be different.

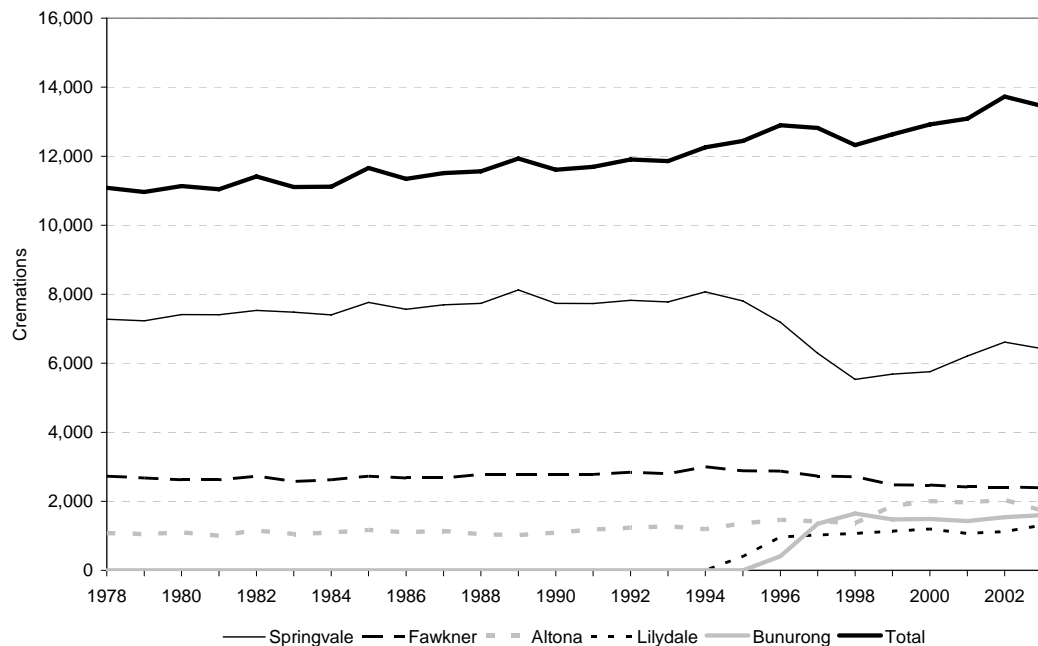
The returns for regional crematoria are significantly lower than for metropolitan ones. There is insufficient throughput to justify a new entrant to the industry ‘attacking’ an existing regional market.

Establishment of new regional crematoria would typically be expected to occur in geographically distinct markets. Any likely entry would be positioned to expand the Victorian market (albeit potentially cannibalising interstate industries).

Consequently, a new regional crematorium would be unlikely to cause cannibalisation of an existing crematorium and any detrimental industry effects are likely to be minimal.

In contrast, the metropolitan market may be approaching saturation. Much of the market share obtained by any entrant will be at the expense of incumbents. This was demonstrated in the analysis of cremation demand and replicated in Figure 23. The growth in cremations for Lilydale and Bunurong were at the expense of Springvale. Similarly, albeit less proportional, Ballarat experienced a drop of around 300 in demand between 1987 and 1989 when Geelong was established.

Figure 23 – Cremations in Melbourne



Source: Information provided by Melbourne Cemetery Trusts with crematoria, 2004.

For this reason, we concentrate on modelling the impact of market cannibalisation from a metropolitan entrant though a regional entrant is also likely to impact on its nearest neighbour.

In modelling the impact, it is unclear whether cannibalisation largely affects a minority of crematoria or all. However, the effect on metropolitan crematoria can be bounded by the two extremes of:

- all of the impact falling on one crematorium (**‘concentrated’** reduction); and
- the impact being equally shared across all metropolitan crematoria (**‘shared’** reduction’).

Consequently, competition between the metropolitan crematoria is evaluated against a “shared” reduction and a “concentrated” reduction.

## Results

The base case models an average of 1,009 cremations per cremator unit in 2004.

Under shared cannibalisation, this falls to 897 per cremator unit for each of the eight incumbent and one entrant crematoria.

Under concentrated cannibalisation, the entrant and closest incumbent share the of 1,009 equally (504 each). The throughput (and consequent returns, NPV and cash balances) for the remaining incumbents is unchanged.

**Table 38 – Effects of cannibalisation on metropolitan crematoria**

	Individual Metropolitan			Total Metropolitan		
	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)	IRR (%)	NPV (\$m)	Accumulated Cash Balance (\$m)
<i>Base case</i>	44%	11.4	190	44%	91	1,522
<b>Cannibalisation</b>						
<i>Shared</i>	37%	9.4	158	37%	85	1,418
<i>Concentrated</i>	14%	2.6	44	n/a	85	1,420

Shared cannibalisation results in a relatively small reduction in the profitability of both individual crematoria and for the industry as a whole. Across the industry, the NPV falls by slightly over \$6m.

In contrast, whilst concentrating the losses on one incumbent results in much the same decline in total metropolitan returns and balances, returns of the affected incumbent and the entrant are only marginally above market returns. Under concentrated competition, industry NPV falls by slightly over \$6m, but the NPV for the closest existing crematorium falls by \$9m.

### 7.13.6. Summary effects

Table 39 below provides a summary of the impacts of price reductions and cannibalisation.

It also includes the combined effects of price competition and cannibalisation.

**Table 39 – Summary effects on total NPV and cash balances**

	Change	
	NPV \$m	Accumulated Cash Balance \$m
<b>Original 21 cremators</b>		
<b>Price effects</b>		
<i>Base case</i>		
<i>Small price fall</i>	-49	-819
<i>Large price fall</i>	-98	-1,638
<b>Two additional cremator units in metropolitan area (no effect on rural volumes)</b>		
<b>Shared cannibalisation</b>		
<i>Base case</i>	-13	-210
<i>Small price fall</i>	-62	-1,029
<i>Large price fall</i>	-111	-1,848
<b>Concentrated cannibalisation</b>		
<i>Base case</i>	-12	-204
<i>Small price fall</i>	-61	-1,024
<i>Large price fall</i>	-110	-1,843

The dominant effect for the industry as a whole is the threat of price competition. In a market (particularly in Melbourne) where around 54% of deaths result in cremation, there is limited opportunity to establish new crematoria based on new markets. Consequently, any entry is likely to cannibalise existing crematoria share. If entry results in a sharing of the “burden” then it will not be in the interest of existing crematoria to engage in a price war. Indeed the potential losses may threaten more marginal incumbents.

However, if much of the burden of cannibalisation falls on one existing crematorium, the reduction in returns is significant. The capacity to actually engage in a price war is however, now significantly reduced. Much of the pre-existing surplus would be lost by higher unit costs resulting from the fall in throughput. This is the case for regional Victoria.

## 7.14. Implications

The analysis of the fundamentals of crematoria viability highlight two immediate conclusions.

First, crematoria are viable at very low levels of utilisation at current levels of charging. For most potential metropolitan crematoria, there is little doubt that they would be profitable. In the case of a regional entrant, whether the entrant is viable or not will reflect the demographics of the region. This is examined in Chapter 9. There is a major proviso to this.

Second, any new metropolitan crematorium would create greater tension to cut prices and therefore reduce margins. Under this scenario, it is not possible to predict whether the entrant, or indeed the incumbent, will be viable. What will definitely occur is that total revenues, and cash reserves, will be lower than if there had been no entry.

## 8. Financial Viability Results

### 8.1. Purpose

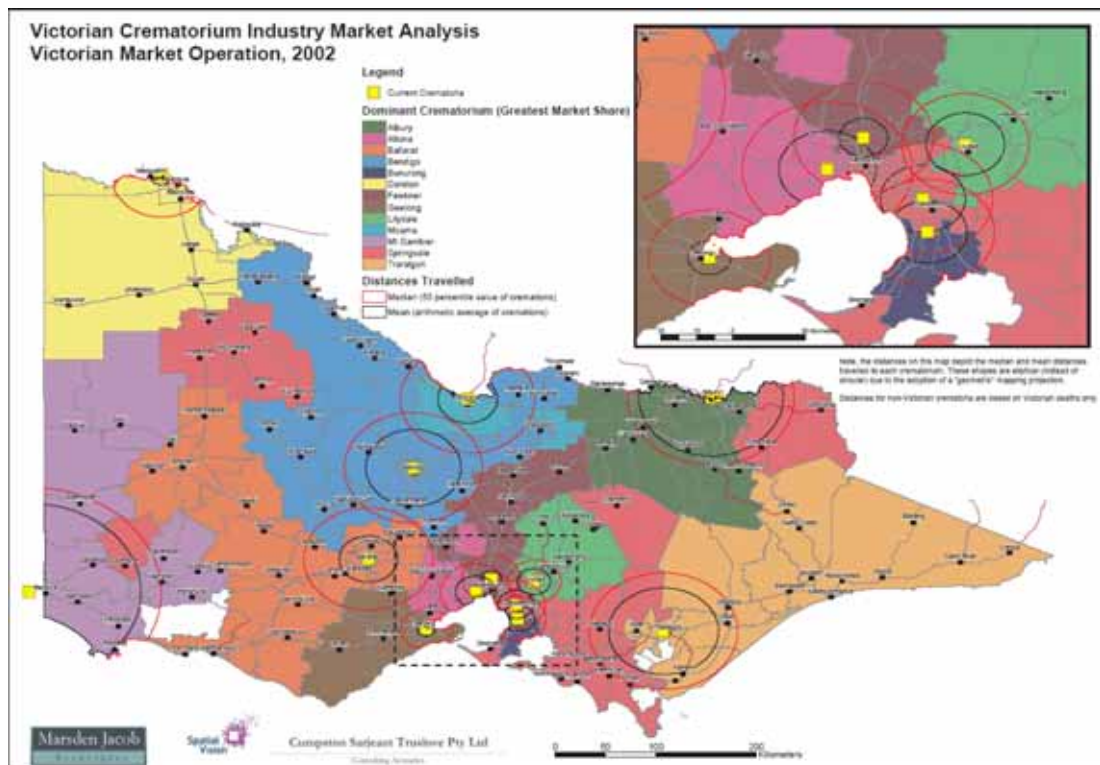
The following sections present results of analysis of the financial viability of each Victorian crematorium.

### 8.2. Financial Viability Results – Metropolitan and Regional Groups

Facilities have been grouped into metropolitan and non-metropolitan (regional). The metropolitan crematoria comprise Altona (The Memorial Park), Bunurong, Fawkner, Geelong, Lilydale and Springvale (the Necropolis). All except Geelong are within the Melbourne metropolitan area and derive the majority of their demand across fairly common areas with significant overlap.

Despite limited competition with other Melbourne crematoria (the Geelong service area does not cross other metropolitan crematoria), the size of Geelong's service area and characteristics of its market have more in common with other metropolitan crematoria than regional ones.

Figure 24 - Market Analysis



The regional crematoria have significantly larger catchments than the metropolitan crematoria. In the case of the interstate crematoria, the averages only reflect their Victorian market. Including “local” cremations may change this significantly with crematoria in Albury and Mt Gambier likely to attract a large number from the local area.

Metropolitan crematoria are modelled to achieve an average rate of return of 39% in the period to 2051. Importantly, this approximate level of return is achieved within ten years. All non-metropolitan crematoria operate at lower scales than the metropolitan crematoria. However, on average they still generate almost 30% in the long run, achieving 25% in the medium term (Table 40).

**Table 40 – IRR for Different Time Periods**

IRR (%)	Short term (5 years)	Medium term (10 years)	Long term (20 years)	Economic long term (to 2051)
<b>Metro average</b>	25	37	39	39
<b>Regional average</b>	11	25	29	29
<b>VICTORIAN AVERAGE</b>	<b>24</b>	<b>35</b>	<b>38</b>	<b>38</b>

The metropolitan crematoria in aggregate are modelled to generate cash reserves of over \$200m in real terms within 20 years. Reflecting the smaller scale of the non-metropolitan crematoria, real cash reserves are expected to increase by around only \$3m to \$15m in the medium to long term (Table 41).

**Table 41 – Real Net Cash Balance at End of Time Period**

\$m	Short term (5 years)	Medium term (10 years)	Long term (20 years)	Economic long term (to 2051)
<b>Metro total</b>	14.5	64.6	232	2,235
<b>Regional total</b>	0.2	3.5	15	162
<b>VICTORIAN TOTAL</b>	<b>14.7</b>	<b>68.1</b>	<b>248</b>	<b>2,397</b>

Whether these funds are sufficient to meet the PMO requirements of individual Trusts and the overall requirements in the cemetery sector will be driven by costs associated with that PMO.

At a real annual rate of interest of 3.3%, \$200m in reserves (in 2003 dollars) will generate sufficient interest income to finance over \$6.6m in maintenance on an on-going basis and ensure the level of reserves is maintained in real terms (with no other income). Expenditure in excess of this amount in real terms will see the real value of the reserves decline over time and require supplementary income from other sources.

## 8.3. Individual Crematoria

### 8.3.1. Review of Financial Indicators

#### IRR

The results for individual crematoria vary from these overall results, in some cases by significant amounts. However, all crematoria in Victoria are expected to achieve significantly more than the market returns in at least the medium term and in some cases in the short term (Table 42).

Table 42 – IRR over various time periods

IRR (%)	Short term (5 years)	Medium term (10 years)	Long term (20 years)	Economic long term (to 2051)
<b>Metropolitan</b>				
Altona	15%	33%	33%	37%
Bunurong	55%	67%	68%	68%
Fawkner	12%	31%	35%	35%
Geelong	3%	25%	30%	30%
Lilydale	102%	109%	109%	109%
Springvale	6%	27%	31%	32%
<b>Metro average</b>	<b>25%</b>	<b>37%</b>	<b>39%</b>	<b>39%</b>
<b>Regional</b>				
Ballaarat	-2%	21%	26%	27%
Bendigo	-16%	12%	18%	20%
Traralgon	54%	66%	67%	67%
<b>Regional average</b>	<b>11%</b>	<b>25%</b>	<b>29%</b>	<b>29%</b>
<b>VICTORIAN AVERAGE</b>	<b>24%</b>	<b>35%</b>	<b>38%</b>	<b>38%</b>

### Net Cash Balances

The second major area of analysis is in terms of generating reserves to meet on-going maintenance needs. All crematoria are expected to generate significant cash balances over the period of the analysis (Table 43).

Table 43 – Real Net Cash Balance at End of Time Period (\$m)

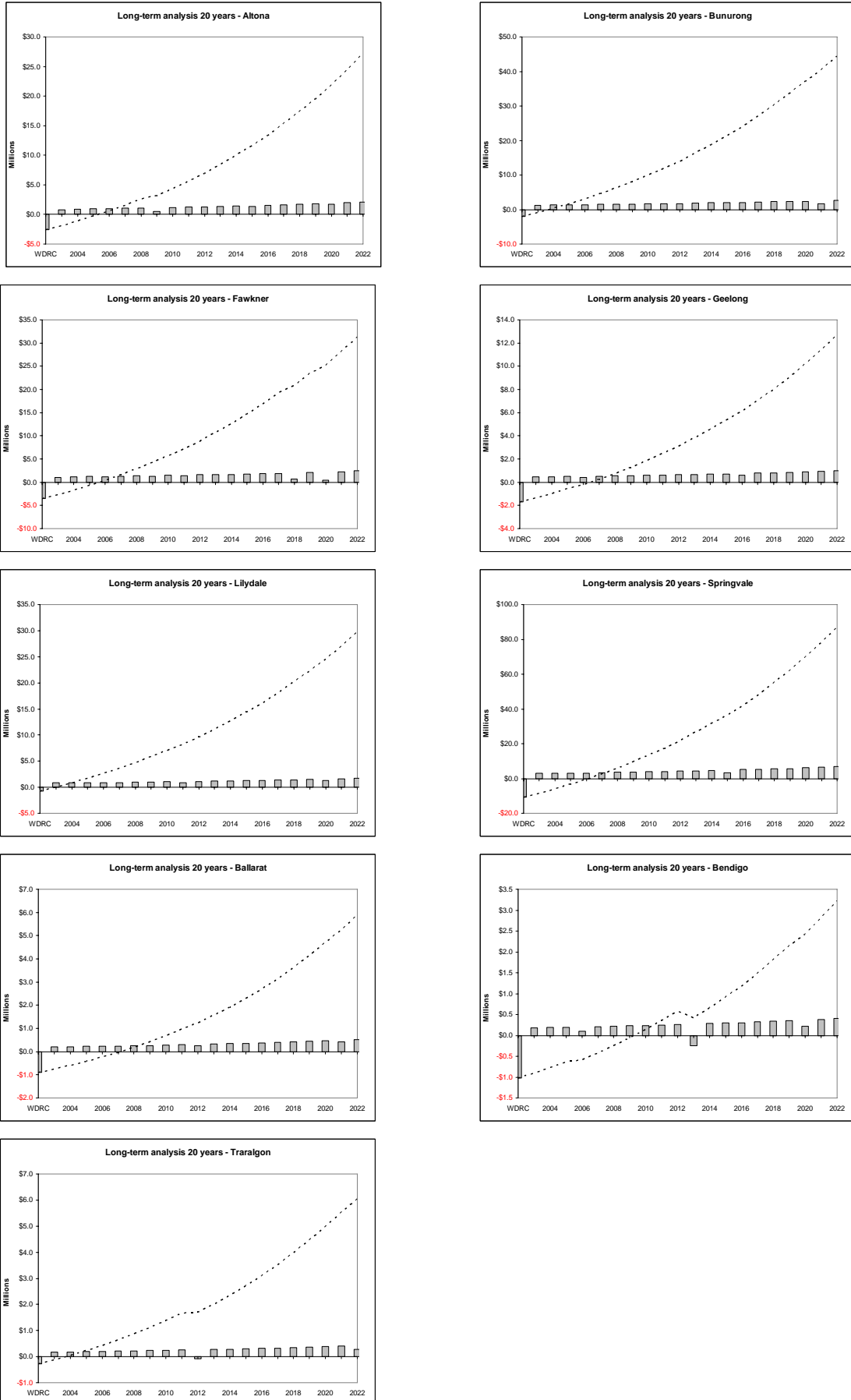
(\$m)	Short term (5 years)	Medium term (10 years)	Long term (20 years)	Economic long term (to 2051)
<b>Metropolitan</b>				
Altona	1.6	7.0	27.2	269.5
Bunurong	4.7	14.1	44.4	391.4
Fawkner	1.6	8.9	31.3	317.0
Geelong	0.3	3.1	12.7	119.2
Lilydale	3.6	9.6	29.7	254.1
Springvale	2.7	22.0	87.0	884.1
<b>Metro total</b>	<b>14.5</b>	<b>64.6</b>	<b>232.4</b>	<b>2,235.4</b>
<b>Regional</b>				
Ballaarat	-0.3	1.2	5.9	64.4
Bendigo	-0.4	0.6	3.2	37.5
Traralgon	0.7	1.7	6.0	59.7
<b>Regional total</b>	<b>0.2</b>	<b>3.5</b>	<b>15.1</b>	<b>161.5</b>
<b>VICTORIAN TOTAL</b>	<b>\$14.7</b>	<b>\$68.1</b>	<b>\$247.5</b>	<b>\$2,396.9</b>

### Annual Cash Balances

Figure 25 shows the pattern of nominal annual cash balances and net real cash balances for the next 20 years for each crematorium. The figure shows the current written down replacement cost of current major assets associated with each crematorium. Most crematoria are able to earn sufficient annual returns to achieve a positive net balance within five years.

The exceptions are Fawkner and Bendigo. In the former case, there were significant recent asset acquisitions that are being written down. This cost requires significant returns to cover its interest costs. In the case of Bendigo, the low level of throughput and its recent replacement of its equipment reduces the margins being earned, albeit still well above market rates. This rate of return implies that for the current written down level of assets, it will take slightly more than five years to generate a positive cumulative cash balance.

Figure 25 – Crematoria Cash Balances





### 8.3.2. Altona Crematorium Viability

Altona is modelled to achieve around the metropolitan average in both the shorter and longer terms. Most of its building works date to 1991, and consequently, will not impose significant upgrading costs in the near term.

In the medium to long term, Altona will generate between \$5m and \$30m towards its cash reserves.

### 8.3.3. Bunurong Crematorium Viability

Despite being a recent development, Bunurong is expected to generate significant returns almost immediately. These returns are based on actual cremations in 2003 (around 1,500). Current cremation rates suggest that Bunurong may undertake around 1,800 cremations in 2004.

Reflecting the strong position of Bunurong, the crematorium is expected to generate cash reserves in the order of \$10m to \$40m in the medium to long term. These will be significantly exceeded to the extent that the base number of cremations is understated and that cremation demand growth exceeds the expected average (which is likely given Bunurong's location).

### 8.3.4. Fawkner Crematorium Viability

The returns to the Fawkner crematorium are among the weakest for the State in the early period. It is not until the medium term, that returns will average significantly above the share market average. This weakness reflects significant recent expansion. The weakness may be compounded by expectations for a major upgrade to Fawkner's chapel facilities which may require a multi-million dollar investment. This analysis, however, does not include this expected expenditure.

Reflecting this weakness, Fawkner is expected to generate only \$1½ m in the short term but should generate \$10m to \$30m in the medium to long term. The fundamental strength of Fawkner is, however, demonstrated by the returns achieved by the long run.

### 8.3.5. Geelong Crematorium Viability

Geelong crematorium is expected to generate solid returns in the medium to long term. These returns are not "threatened" by any significant building programs. It is of interest that the crematorium is located away from current gas pipelines and may not be serviced by such in the short to medium term. As such, it is unlikely that Geelong will change its operations to piped gas until residential development moves closer to its location.

Reflecting the significantly smaller scale of operations compared with other metropolitan crematoria, Geelong is modelled to generate between \$3m and \$13m in the medium to long term.

### 8.3.6. Lilydale Crematorium Viability

Lilydale is expected to generate significant returns across all time periods. Despite having three cremators, its works program is unlikely to place significant strain on its cash flows. However, common with other metropolitan crematoria, this may be threatened by any decision to increase significantly the scale of its chapel. Advice from Lilydale allocated only \$50,000 of overhead/administration costs to the crematorium which is around 20% of its administration costs. Even increasing this allocation to 40% (the level reported at Springvale) reduces the reported IRR to just under 100%.

In the medium to long term, Lilydale is modelled to generate real cash reserves of between \$13m and \$30m.

### 8.3.7. Springvale Necropolis Crematorium Viability

Springvale is expected to generate returns slightly under the metropolitan average over all time periods. Given its size, Springvale acts very much AS the metropolitan (and State) average. Current low returns reflect the winding out of recent major capital works.

Reflecting particularly the scale of its operations, Springvale is expected to generate real cash reserves of between \$20m and \$90m in the medium to long term.

### 8.3.8. Ballarat Crematorium Viability

Ballarat is the largest of the non-metropolitan crematoria. It is expected to achieve rates of return of almost 30% in the long run and over 20% in the medium term.

In the medium to long run, the Ballarat crematorium is expected to generate real cash balances of between \$1m and \$6m.

### 8.3.9. Bendigo Crematorium Viability

Bendigo suffered from a major explosion in 2002 which saw much of its equipment replaced. As a result, there is a significant impact of its WDRC in the short term on its rate of return. Overall, it is expected to achieve rates of return slightly under 20%.

Over the medium to long run, the Bendigo crematorium is expected to generate real cash reserves of between \$0.5m and \$3m.

### 8.3.10. Traralgon Crematorium Viability

Traralgon is the smallest of the Victorian crematoria. It combines much of its operations (cemetery and crematorium) together. As a result, it is expected to achieve very high returns despite very low throughputs.

Despite low throughputs, Traralgon is expected to generate real cash reserves of between \$1m and \$4m in the medium to long term.

## 8.4. Summary

Crematoria services in Victoria are very profitable. The returns for even the smallest cremation operation far exceed the expected earnings possible through the share market and *a fortiori* the cost of capital for the investment.

However, the quantum of earnings are particularly concentrated in these few Trusts and one-third likely to be earned by Springvale.

## 9. Cremation Market Analysis & Review of Potential Sites

### 9.1. Purpose

This section outlines the market analysis undertaken and our findings upon reviewing potential sites for new crematoria facilities.

### 9.2. Market Scenarios Tested

From our analysis of demand for cremations in Victoria, current crematoria capacity, and the patterns of use of these facilities it is evident that the vast majority of the State is well-served by the current network of crematoria (see Chapter 4).

However, it is possible that the introduction of additional facilities will increase the demand for cremations (i.e. result in a supply-induced increase in demand).

Our analysis shows that irrespective of the assumptions about future demand for cremations, the current industry has the capacity to service demand until close to 2051.

Therefore, based on this market analysis, there would appear to be little justifying the establishment of new crematoria in Victoria.

To test this conclusion, a number of market scenarios were examined whereby new facilities were established at various locations around the State.

#### 9.2.1. Metropolitan Locations

Our analysis of cremation demand has shown that it is generally highest in areas served by existing facilities (refer Map 2.8). These areas comprise the Melbourne metropolitan area and urban centres with a crematorium. The corollary to this is that demand in these locations is unlikely to increase further based on the addition of new facilities.

Whilst some SLAs recorded below average rates of cremation in 2002, it is evident that this is not due to the distance between the SLA and a crematorium. Further, there is no evidence to suggest any part of the Metropolitan Area is exhibiting unmet need.

Given that existing capacity in Metropolitan crematoria is sufficient to meet forecast demand until at least 2040-2050 (see Table 2.9), it is considered that new facilities will not be warranted within the Melbourne metropolitan area within the forecast period.

Moreover, were additional facilities established in this part of the State, it is expected that they would merely redirect market share away from existing crematoria. Whilst greater utility may be offered to the market by a more diverse industry, the negative impacts of even lower utilisation rates are expected to be significant and potentially deleterious for the industry at large.

*As a result scenarios for additional metropolitan facilities have not been explored further.*

## 9.2.2. Other Locations

In contrast, the siting of new facilities in some non-metropolitan regions would have significant potential to increase cremation rates in those regions. However, any new facilities must meet the first evaluation criteria of being viable in its own right. For this to be the case, the facility must be able to generate sufficient annual throughput.

If additional facilities were to be added to the current Victorian network, it is our judgement that there are three potential candidate locations worthy of investigation within the State.

**Shepparton, Wangaratta** and surrounding districts are currently being served by facilities located at Bendigo, Moama and Albury, and, to a lesser degree, by Springvale. It is possible that there might be sufficient demand from this area in the future to support an additional facility. Therefore, locations at both towns have been considered.

In western Victoria, the township of **Horsham** is remote from many of the current facilities and has experienced a small increase in population (see Map 2.3) and is forecast to experience a small increase in deaths over the next 50 years (see Map 2.1). It is possible that a new facility established at this location may be feasible.

## 9.3. Approach

### 9.3.1. Distances Travelled

The median distances travelled to regional-based crematoria are listed in Table 44.

From this table it is evident that whilst median distances for these facilities range up to 88 kilometres, with most facilities recording less than 60 kilometres. As only a small proportion of patronage for interstate facilities has been analysed (i.e., just the Victorian cremations) it is expected that the medians for these facilities may reduce considerably were data for New South Wales and South Australian cremations included.

For the purposes of this analysis it has been assumed that any new Victorian rural-based crematorium will exhibit a median travel distance of approximately 75 kilometres. This figure represents a conservative estimate of the likely median distance travelled as it could well be lesser.

**Table 44 – Median Distance Travelled to Regional Crematoria, 2002**

Facility	Distance (kilometres)
Ballaarat	20
Bendigo	38
Traralgon	43
Moama (NSW)	24
Dareton (NSW)	10
Albury (NSW)	58
Mount Gambier (SA)	88

Source: BDM/ABS

### 9.3.2. Market Share

Reviewing current patterns of cremations it is evident that on average, a crematorium achieves an overall market share within this median distance of between 35 and 40%.

The addition of new cremation facilities will increase competition, and in future this figure may therefore be expected to reduce.

However, a conservative approach to the analysis has been taken and a market share of 40% has been adopted (the actual market share figure is expected to be lower).

### 9.3.3. Minimum Throughput

The minimum throughput required for viability has been determined to be between 420 and 480 cremations per cremation unit per year (refer Section 7.9). This estimate is based on a generous average revenue received by an entrant.

Given the median distances, it follows that 50% of a facility's patronage will travel 75 kilometres (the median travel distance adopted) or less.

Therefore to achieve viability, it will be necessary for a proposed crematorium to derive between 210 and 240 cremations from within this distance.

## 9.4. Findings

Using the above assumptions (a median distance travelled of 75 kilometres, a market share within this area of 40% and a threshold of between 210 and 240 cremations per annum), it is possible to undertake an analysis of the numbers of potential cremations for each of the proposed facilities.

#### 9.4.1. New crematorium at Horsham

The number of cremations within 75 kilometres of Horsham has been estimated using the cremation forecasts developed earlier. The results are shown in Table 45.

The share of these cremations that the new facility would enjoy has also been calculated and the results are shown in Table 46.

Given that the most likely forecast scenario is the medium cremation rate/medium mortality rate series, it is evident that a new crematorium at Horsham is unlikely to achieve the minimum throughputs required within the forecast period.

Even with 100% market share, it is expected that there would be insufficient cremations at the facility until sometime after 2036.

**Table 45 – Forecast Cremations within 75 kilometres of Horsham (per annum)  
- 2006 to 2051**

Year	Low Cremation Rate (current)		Medium Cremation Rate		High Cremation Rate	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	131	131	137	137	155	155
2011	138	138	141	140	160	158
2016	143	138	147	141	166	160
2021	150	140	151	143	172	161
2026	160	142	160	143	182	162
2031	173	145	175	147	198	167
2036	193	153	194	154	221	175
2041	213	162	214	162	243	185
2046	228	169	229	171	261	193
2051	239	174	239	174	272	198

Source: Spatial Vision

**Table 46 – Estimated Cremations for a New Facility in Horsham (per annum)  
- 2006 to 2051**

Year	Low Cremation (current)		Medium Cremation		High Cremation	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	52	52	54	54	62	62
2011	55	55	56	56	64	63
2016	57	55	58	56	66	64
2021	60	56	60	57	68	64
2026	64	56	64	57	72	64
2031	69	58	70	58	79	66
2036	77	61	77	61	88	70
2041	85	64	85	64	97	74
2046	91	67	91	68	104	77
2051	95	69	95	69	108	79

Source: Spatial Vision



#### 9.4.2. New Crematorium – Wangaratta

The number of cremations within 75 kilometres of Wangaratta has been estimated. The results are shown in Table 47.

The share that the new facility would enjoy of these cremations has also been calculated and the results are shown in Table 48.

From these tables, it is evident that a new crematorium at Wangaratta is likely to achieve the minimum throughputs required only after 2041 (depending on which projection series is assumed).

To prove viable in the short term, this facility would need to achieve a market share in excess of 75%. (This is considered unlikely given existing patterns of market share.)

**Table 47 – Forecast Cremations within 75 kilometres of Wangaratta (per annum)  
- 2006 to 2051**

Year	Low Cremation Rate (current)		Medium Cremation Rate		High Cremation Rate	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	230	230	288	288	331	331
2011	236	236	292	291	338	332
2016	251	241	306	295	351	341
2021	269	252	325	303	374	349
2026	297	262	353	313	407	363
2031	331	280	391	331	456	381
2036	376	296	439	351	509	407
2041	416	317	487	371	564	430
2046	448	333	523	388	606	451
2051	472	343	549	402	638	465

Source: Spatial Vision

**Table 48 – Estimated Cremations for a New Facility in Wangaratta (per annum)  
- 2006 to 2051**

Year	Low Cremation (current)		Medium Cremation		High Cremation	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	92	92	115	115	132	132
2011	94	94	116	116	135	132
2016	100	96	122	118	140	136
2021	107	100	130	121	149	139
2026	118	104	141	125	162	145
2031	132	112	156	132	182	152
2036	150	118	175	140	203	162
2041	166	126	194	148	225	172
2046	179	133	209	155	242	180
2051	188	137	219	160	255	186

Source: Spatial Vision

### 9.4.3. New Crematorium – Shepparton

The number of cremations within 75 kilometres of Shepparton has been estimated. The results are shown in Table 49.

The share that the new facility would enjoy of these cremations has also been calculated and the results are shown in Table 50.

From these tables, it is evident that a new crematorium at Shepparton is likely to achieve the minimum throughputs required somewhere between 2021 and 2031 (depending on which projection series is assumed).

To achieve viable levels in the short term this facility would need to attract better than 50% market share.

**Table 49 – Forecast Cremations within 75 kilometres of Shepparton (per annum)  
- 2006 to 2051**

Year	Low Cremation Rate (current)		Medium Cremation Rate		High Cremation Rate	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	242	242	426	426	486	486
2011	242	242	429	426	493	485
2016	250	240	445	431	510	492
2021	265	246	472	439	540	504
2026	286	255	512	458	588	526
2031	314	265	569	481	655	551
2036	353	281	643	511	735	587
2041	388	297	712	545	818	624
2046	420	311	777	575	890	660
2051	446	325	829	601	948	689

Source: Spatial Vision

**Table 50 – Estimated Cremations for a New Facility in Shepparton (per annum)  
- 2006 to 2051**

Year	Low Cremation (current)		Medium Cremation		High Cremation	
	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality	Medium Mortality	Low Mortality
2006	96	96	170	170	194	194
2011	96	96	171	170	197	194
2016	100	96	178	172	204	196
2021	106	98	188	175	216	201
2026	114	102	204	183	235	210
2031	125	106	227	192	262	220
2036	141	112	257	204	294	234
2041	155	118	284	218	327	249
2046	168	124	310	230	356	264
2051	178	130	331	240	379	275

Source: Spatial Vision

## 9.5. Discussion

The above results indicate that new crematoria at Horsham, Wangaratta and Shepparton are unlikely to prove viable within the short, medium and, in some cases, even the long term.

Of the three locations considered, Shepparton appears to offer the most likely prospects. However, even this location is unlikely to become viable for some 20 years.

Given the conservative nature of the analysis undertaken to forecast these potential throughput levels, it is considered that there is little market evidence to support the need for additional crematoria in Victoria.

(Had any one of the above facilities proven viable, the next step would have been to explore the potential impact of a new facility on existing facilities. Even had a new facility passed the minimum throughput test, the adverse impacts for existing facilities (i.e. loss of market share) would have needed to be moderate. Whilst some competing facilities may be able to withstand some loss of market share, others (particularly the rural facilities) may be vulnerable to such losses. Given the poor estimated throughputs for each of the new crematoria considered, it was unnecessary to undertake an impact assessment. However, it should be recognised that such an assessment should form an essential part of any consideration of such proposals.)

## 9.6. Conclusions

Research conducted for this project has not revealed evidence to support the establishment of additional crematoria in Victoria.

Based on the above analysis, it is concluded that the current mix of crematoria in Victoria adequately services the needs of the market. The industry has sufficient capacity to continue to service these needs for at least the next 40-50 years.

The addition of another facility has been examined and it was found that such a facility would be unlikely to increase demand sufficiently to achieve minimum throughput levels. This is not unexpected given the under-utilisation evident within the industry.

Recommendation 4 – That the Department and Cemetery Trusts focus on maintaining and improving pre-existing crematoria for the next 20-30 years, rather than considering establishing new facilities.
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The Department may in future wish to consider crematorium proposals that do not meet the economic/financial conditions outlined in this report. New facilities may be considered due to particular regional socioeconomic issues (such as access to services) or to address funding shortfalls for particular Trusts.

## 10. Viability of Current Proposals

Additional to the viability study undertaken, this chapter presents an analysis of information made available to us regarding proposed new crematoria facilities at specific locations.

- In particular, we have obtained the Wangaratta City Council's proposal for a crematorium. This information provides a basis for the application of the decision framework.
- An analysis of the Preston Council's proposed crematorium (within the building for its new mausoleum) is provided. However, this is limited by the fact that no detailed information was forthcoming.

This chapter is presented in addition to the market analysis (Chapter 9) which is based on generic/indicative data.

The base case for the potential facilities discussed below is the financial situation for the industry outlined in Chapter 8.

### 10.1. Wangaratta

On financial grounds, the Wangaratta proposal must meet the hurdle rates for its business. As we have no extra information on the Council's cost of capital, we will use the hurdle rates applied for the rest of the industry.

#### 10.1.1. The Proposal

The Council's proposal would see a crematorium established on the existing site with one cremator with ancillary equipment but no cool room. The development would include a (small) chapel. Administration costs are budgeted at \$6,000 pa.

There were no estimates for the rehearsing and rebricking of the cremators. Maintenance costs of \$7,500 were assumed.

The generic analysis above suggests that the minimum required throughput for a crematorium is in the range of 420 to 480.

The Council's proposal estimates that it would need to achieve 150 cremations a year to breakeven. In its conversations with funeral directors, it believes it could meet this target with annual growth of 10% for the following three years. Consistent with the analysis from Spatial Vision, over half of the expected cremations will come from the immediate neighbourhood. In fact, the Council is expecting around 90 from the City itself.

The proposal expects that most of those cremated will use the chapel and be interred at the cemetery.

Based on the assumptions in the proposal, the Wangaratta crematorium would meet its hurdle rate of return. The economic/financial model predicts that while returns would be only 2% in the short term, this would rise to 33% in the medium return and 38% thereafter. In the medium to long term, the crematorium is expected to generate between \$0.8m and \$4m for the cemetery trust.

### 10.1.2. Review of Inputs

However, there are a number of concerns with this analysis.

First, we have undertaken an analysis of expected demand for cremation in Wangaratta. This suggests that a new crematorium would expect to receive around 92 cremations from within 75km of Wangaratta in 2006. This implies that base demand may be 184 in that year. We have therefore used this as the estimate for the first year of operations. There is not expected to be any faster rate of increase. The 92 cremations represents the “steady-state” level of demand.

We have no information to suggest that the rate of memorialisation or use of chapel facilities will be any higher in Wangaratta than experienced in other regional crematoria. These have therefore been set to 1/6 and 2/3 respectively.

We have not altered the allocation of overhead costs, but note that the new facility does not appear to make a contribution towards the upkeep of roads.

The proposal provided by Wangaratta does not include information on the necessary rehearsing and rebricking that is required for a cremator. The maintenance value included is slightly higher than the maintenance costs experienced by Traralgon. We have therefore considered this to be inclusive of rehearsing costs but not rebricking. These are set \$40,000 (among the lower charges across the State) every 4,500 cremations which is the same rate as for Traralgon.

Under these assumptions, the facility is unlikely to achieve a return in the short and only likely to achieve 9% in the medium term. For longer periods, the return is likely to increase to 18% to 20%.

This analysis is under a situation with little attribution of overhead costs, very low wages costs, still very high chapel charges and low cremator maintenance costs. With administration and wages costs set at the low level for Bendigo and chapel service revenues set at the high levels recorded at Geelong, long-term returns are 7% only rising to 12% in the very long term, with negative returns even in the medium term.

### 10.1.3. Review of proposal

This analysis of the information in the Wangaratta business case suggests that even as a standalone proposal, it is likely to be marginal. In addition, a facility at Wangaratta will have a catchment that overlaps with that at Bendigo. While much of the demand met by Wangaratta will be new demand or demand currently serviced by Albury crematoria, it is likely that a proportion will be met from funeral directors that currently use Bendigo crematorium.

While a facility at Wangaratta is viable based on the proponent’s estimates, we consider that these are not representative of the likely costs and revenues that the facility will face. Informed by our analysis of the operations of existing crematoria and using indicative cost estimates from the representative model, a facility at Wangaratta is likely to be marginally viable at best. However, as it is also likely to reduce demand and returns to Bendigo, the economic/financial criteria indicate that the facility should not go ahead.

## 10.2. Preston

The Council at Preston is intending to incorporate a crematorium within the building for its new mausoleum. Detailed data were not provided for the Preston proposal, but we can obtain insights from the representative model and the analysis of unmet demand in Victoria.

A facility at Preston is likely to be a two cremator operation with significant works undertaken to create an area for memorialisation. The larger crematoria require throughput of 460 per annum.

In metropolitan Melbourne in 2002, the spatial analysis suggested that the current (minimum) rate of cremation was 53.6%. This represents the rate that could be expected with no new crematoria. The spatial analysis identified medium and high rates of cremation based on the rates achieved in SLAs located near to crematoria.

The spatial analysis considered it unlikely that the high cremation rates could be achieved. For the purposes of this analysis, we consider a new facility will increase metropolitan demand from the minimum to the medium cremation rate – from 53.65 to 55% for urban cremations and 58.7% to 60% for non-urban. This represents the maximum amount of previously unmet demand. It is likely that a large proportion of this theoretical unmet demand would not be met by one crematorium.

As a result, a new facility would increase metropolitan demand by 308. The remaining 152 would be taken from other facilities. It is unlikely that this cannibalisation would be spread evenly between crematoria but is likely to lead to reductions for Fawkner (and possibly Lilydale).

At the breakeven level for Preston (which may be higher if costs are appreciably higher for its facility), the facility will generate around \$0.5m by 2022 and \$4.0m by 2051 in constant price terms. However, if all of this cannibalisation falls on Fawkner, that facility would be expected to lose \$4.0m by 2022 and \$32m by 2051 in constant price terms. Even if the burden were evenly spread across all metropolitan facilities except Geelong (i.e., 30 cremations each), similar total losses would be experienced, albeit with the burden spread across all of these facilities.

## 10.3. Conclusions

The further analysis in this section is consistent with that of the previous chapter. No further recommendations are warranted.

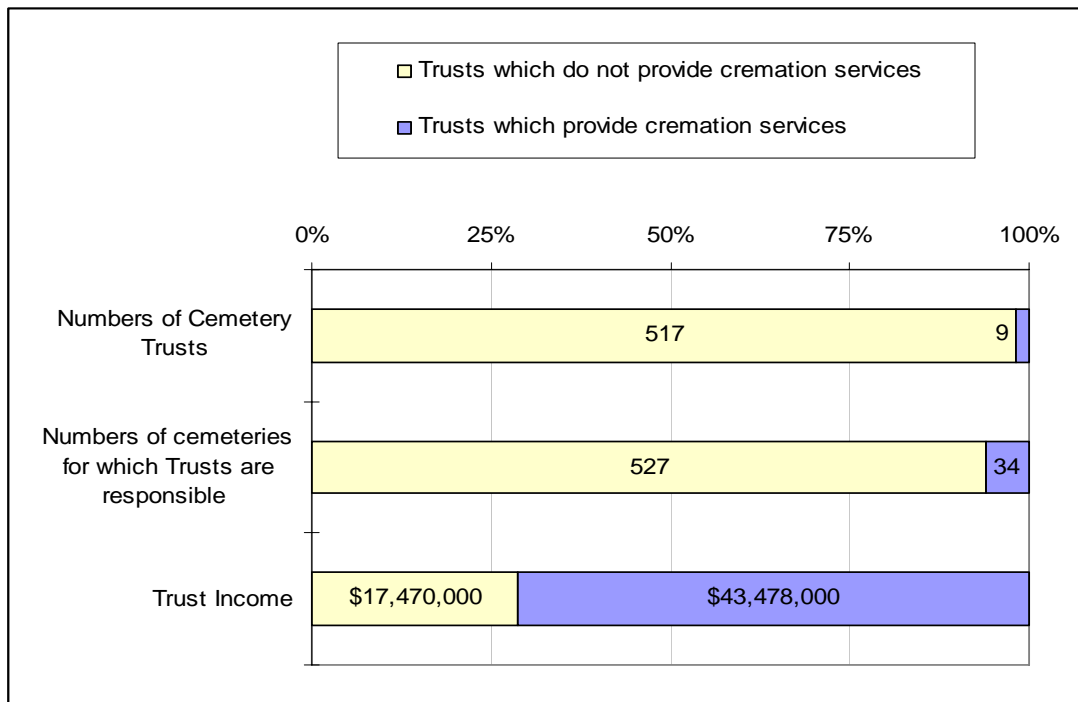


# 11. Other Considerations

## 11.1. Industry Policy

Two per cent of Victorian Cemetery Trusts (by number) share approximately 71% of the industry’s income, yet are only responsible for 6% of Victoria’s public cemeteries (by number). Figure 26 attempts to depict this situation.

**Figure 26 – Comparison of Trusts with and without crematoria**



Source: Income figures based on RSM Bird Cameron, 2002.

It must be noted, however, that these figures do not take into account the cost side of the equation, nor even the size and relative importance (e.g. heritage values) of the cemetery sites under Trust control. The Trusts that currently operate crematoria are responsible for some of the larger cemetery sites and are likely to be required to fund some of the more expensive cemeteries. Nonetheless, there is undoubtedly a large perpetual maintenance obligation associated with cemeteries that are under the care of Trusts which do not have cremation revenue as a source of income.

Given that we do not foresee sufficient demand in Victoria to support the construction of new crematorium facilities, the question of cremation income disparity between the Cemetery Trusts remains. That is, whilst all Victorian Cemetery Trusts are obligated to provide for the ongoing maintenance of cemeteries, only a few have the opportunity to raise and invest funds via revenue from cremation services (and mausolea).

However, this report cannot make any conclusion on the ability of the existing and future revenues from cremation to fund the PMOs of all of the Trusts, nor even for those Trusts that operate them. It cannot therefore recommend whether revenue should be redistributed from Trusts with existing cremation facilities.

It is the case, however, that those Trusts without crematoria will continue to desire the ability to undertake cremation services to supplement their revenues and that the conclusions of this report confirm that metropolitan Trusts would generate greater income for themselves if they operated a crematorium.

It is important to note that, compared with the major sources of operational revenue, cremation income is not currently affected by capacity constraints. This is in stark contrast to burials, for which income is limited by land availability, yet maintenance costs are potentially unlimited. Therefore, not only are most Trusts not accessing a major revenue source, this source is not as limited as burial revenues.

This report has investigated and made recommendations effectively on the most efficient way that the Department can raise revenue through cremation services. The current model is similar to a franchise, that is the overarching organisation seeks to maximise the total returns for the industry. For that purpose, this franchise model is effective.

It is not effective at addressing distribution of returns. A continuation of the current approach will see the “haves” continue to earn significant revenues and possibly fund their PMO and the “have nots” face dwindling income earning capacity with increasing costs.

It is clearly outside our scope to evaluate the alternative models of distribution. However, now that issues of profitability and location for cremation services have been investigated, this provides an opportunity for the Department and the industry to reflect on policy options regarding income sources and maintenance obligations more generally. We can provide comment on the implications of our analysis on an analysis of distribution.

#### **11.1.1. Potential Options**

As noted above, the recommendation of this report is that no new crematoria be built in the medium to long term. This necessitates a review of the distribution (if possible) of existing revenues to meet the industry’s PMO.

A wide range of options exist to address the linked issues of PMO funding and equity in access to cremation revenue.

The options discussed below can be broadly categorised as follows:

1. Changes to the structural arrangements of provision of cremation services to distribute the profits of cremation directly, or
2. Other mechanisms to access and (re-)distribute the profits of cremation, e.g., via licensing fees, industry levy etc.

(Raising the required funds via general taxation is not considered here as a feasible option.)

#### **11.1.2. Structural changes to provision of cremation services**

Changing where cremation is undertaken and who undertakes it will:

1. impact on the returns of affected Trusts and for the industry as a whole; but potentially
2. allows improved distribution of revenue and operational efficiencies.

A number of possibilities include:

- allow unrestricted expansion in crematoria by Cemetery Trusts;
- allow restricted (planned) expansion in crematoria by Cemetery Trusts;
- optimise the location of furnaces within the current service providers;
- optimise the location of furnaces across all potential Cemetery Trust providers;
- transfer provision of cremation services to the Victorian government;
- regionalisation of Trusts (formalised groupings by location);
- amalgamate Trusts with crematoria with Trusts with funding shortfalls as needed (over time);
- enter into public-private arrangements (various models) or allow private sector provision.

### Allow unrestricted (or restricted) expansion in crematoria

This study has concluded that increasing the number of crematoria in Victoria would be unjustified on economic/financial grounds (for at least 20-30 years).

However, the model developed does not include the costs associated with redistributing funds from existing crematoria to those Cemetery Trusts with funding shortfalls. It may be the case that the loss of profits is less than the administrative costs of redistribution – although this is unlikely given the magnitude of losses expected from cannibalisation.

Expanding the number of Trusts with crematoria basically extends the ‘lottery’ effect currently occurring (those with a crematorium are ‘winners’ while those without are ‘losers’). Where there are only a few Trusts with funding difficulties, there may be benefits to identifying these Trusts and compensating these losses by allowing the Trust to undertake cremations.

However, there is no *a priori* reason to believe that the actual revenue generated by providing cremation services will match the actual funding needs of that Trust. Similarly, there are no *a priori* reasons that the impact of this entry will have least impact on other Trusts.

An advantage, however, of this approach is that it may allow on-going funding of Trusts with minimal intrusion by the Department. If crematoria placement aligns with funding need, then the Department will not be required to undertake potentially annual re-allocations of funds to under-funded Trusts.

### Optimise location of furnaces

As demonstrated, Victoria currently has significantly more furnaces than are required to meet demand and a number of crematoria are operating at relatively low utilisation. Particularly in metropolitan Melbourne, there does not appear to be significant unmet demand. What unmet demand is observed, may be met without expanding existing capacity.

In common with the previously discussed option, there is no *a priori* reason that the re-location of furnaces to different sites will not have an adverse effect on existing operations.

## Transfer provision to State government

One option is the separation of the earning of cremation revenue from the need for extra revenue. However, transfer of funds from one Trust to another may dilute the incentive for Trusts in providing profitable cremation services.

Moving operational responsibility for crematoria from the Trusts altogether and giving to the State government (or a centralised Board) may circumvent this issue, but it will raise more and potentially more serious issues associated with centralised public sector provision.

Central co-ordination or provision by the government may:

- Redistribute revenue and improve overall returns by facilitating efficient location of furnaces and allowing sufficient scale to encourage private involvement and potential efficiency gains.
- Be beneficial in planning, marketing and promoting industry-wide solutions.

However it may also impact on memorialisation sales; lead to reduced local focus and reduced voluntary effort; and increase co-ordination costs.

## Regionalisation of Trusts

Trusts could be formally grouped, possibly by location, to share cremation revenues and achieve other synergies. This could be organised, for example, such that each grouping has access to revenue from a crematorium and that the size of the group corresponds to the size of revenues from that crematorium.

Such a relationship may require significant if not legalistic relationships between Trusts. Each Trust would remain a separate entity and be responsible for its viability.

## Amalgamation of Trusts

Trusts with crematoria could be amalgamated with those Trusts experiencing funding shortfalls as needed. This could occur at a single point in time, resulting in formation of 'super-Trusts'.

Alternatively, a creeping amalgamation could occur on an *ad hoc* basis, as required. This effectively appears to be the *status quo*, for example, whereby The Necropolis Springvale is responsible for the maintenance of the Melbourne General and St Kilda cemeteries.

The difficulty with this approach is that it reacts to funding failures and effectively 'punishes' profitable Trusts by imposing PMOs from unviable cemeteries.

It does not impact on the incentive to undertake cremations, except that the more profitable is an operation, the more likely that it will be 'laden' with a non-viable cemetery. In addition, like central government provision, amalgamation may impact on the local focus of a cemetery and on volunteerism.

## Alternative public-private models or privatisation

Alternative public-private models could be examined. This would continue public ownership, but allow different levels of private operational control and possible efficiencies. However, current government policy is for full public provision of burial and cremation services. Additionally, in itself, this will not assist to redistribute funds.

### 11.1.3. Other mechanisms to (re-)distribute cremation revenues

An industry fund could be established to cover the PMOs.

There exist a range of sources of funds including products and services provided by Cemetery Trusts (cremation, memorialisation and burial) and by funeral directors. For example, contributions to the fund could come from:

- Imposition of a franchise or licence fee on cremation (and mausolea) products and services. This may or may not be related to revenue/throughput. Alternatively, the licence may be bid for or tendered.
- Sale of licences to private operators of cremation services.
- Rental of public crematoria to private operators.
- Levies/fees/charges applied to the death care industry more broadly (e.g. including funerals).

Setup of an industry fund requires:

- a formula to determine who contributes and how much they contribute; and
- a formula to determine who receives payment and how much they receive.

Cremations overall impose less of a maintenance obligation than burials (this is one factor in the popularity of cremation with consumers). So it would be incongruous that responsibility for maintenance of existing maintenance obligations should be met solely by future cremations. The funding of the PMO must recognise that any extra charge will impact on demand for affected services and that ultimately it will be paid by consumers of death care services. Secondly, the impact will be also distorted to the extent that existing prices do not reflect costs.

If cremation solely funds the PMO, there would be an incentive for consumers to choose burial (or mausolea). There is no *a priori* reason for favouring these methods of disposal. If a purpose of the surcharge is to promote more sustainable disposal practices, then the surcharge for cremations should be such that demand is moved away from burial (and, probably to a lesser extent, memorialisation). Funding of the overhead through a cremation levy will result in the funding falling on a group of consumers who in fact are not 'contributing' to the problem.

In addition, distortions may be compounded where the base price is not cost reflective. Where the actual price of burial does not reflect its costs, care should be taken in setting relative surcharges.

In finding sources for an industry fund, consideration would need to be given to the overall impact on demand for the different competing and complementary services provided in the death care industry.

### 11.1.4. Conclusion

There is no reason that the most efficient location for siting crematoria and furnaces will necessarily coincide with the funding needs of existing Trusts.

The key would appear to be in developing a methodology that allows the redistribution of funds *from* those Trusts with crematoria *to* those Trusts that are under-funded, *without* removing the incentive for the service provider to earn that revenue. Therefore any redistribution should not be a disincentive to providing cremation services nor distort the cremation/burial decision. In addition, any redistribution must also take into account the significance of other income sources of Trusts (e.g. memorialisation sales).

Recommendation 5 – That the Department examine policy issues and options for Cemetery Trusts regarding income sources, their distribution and maintenance obligations more generally.

Any such review should consider impacts on related private sector providers and total ('economic') costs to the community.

## 11.2. National Competition Policy

Like all other areas of Australian economic activity, the provision of death care services is covered by one or more of the generic clauses of the Competition Principles Agreement (CPA). All States and Territories are signatories to the CPA, the Conduct Code and the Agreement to Implement Related Reforms.

The cemetery sector (and the crematorium industry as part of that sector) are State-owned enterprises that are operated by locally organised Cemetery Trusts. Cemetery Trusts are statutory authorities and are responsible to the Minister and to Parliament. As such, these operations must be compliant with Victoria's obligations under the CPA.

Compliance with the CPA requires, *inter alia*, that a number of clauses be met:

- Competitive Neutrality (CN) (clause 3) which seeks to eliminate resource allocation distortions arising out of the public ownership of entities engaged in significant business activities;
- Prices Oversight (clause 2) which imposes independent pricing regulation on significant government enterprises that are at least near monopolies;
- Structural Reform of Monopolies (clause 4) which contains generic requirements of competition reform, reflecting well-established and broadly applied principles, for markets previously supplied by government monopolies;
- Legislation Review (clause 5) which requires that legislation that restricts competition must be removed unless (i) benefits outweigh the costs and (ii) there is no competitive means of achieving the same results; and
- Access to Infrastructure (clause 6) which establishes a regime for third party access to significant infrastructure facilities.

Our analysis of the financial viability of the crematorium industry provides insights into the returns for the industry and sector that have implications for Prices Oversight and CN. Note that this analysis is distinct from a full NCP Review of Cemetery Trusts.

## Prices Oversight

The key elements of the Prices Oversight clause are:

*2.(1) Prices oversight of State and Territory government business enterprises is primarily the responsibility of the State or Territory that owns the enterprise.*

...

*(3) In accordance with these principles, State and Territory Parties will consider establishing independent sources of price oversight where these do not exist.*

*(4) An independent source of price oversight advice should have the following characteristics:*

*(a) it should be independent from the government business enterprise whose prices are being assessed;*

*(b) its prime objective should be one of efficient resource allocation, but with regard to any explicitly identified and defined community service obligations imposed on a business enterprise by the government or legislature of the jurisdiction that owns the enterprise;*

*(c) it should apply to all significant government business enterprises that are monopoly, or near monopoly, suppliers of goods or services (or both);*

*(d) it should permit submissions by interested persons; and*

*(e) its pricing recommendations, and the reasons for them, should be published.*

Prices for crematorium services are proposed by Cemetery Trusts and approved by Governor in Council. The proposals are administered through the Department of Human Services. Under the new Act, the Secretary must approve any fees (s.40).

Our analysis suggests that Cemetery Trusts are earning profits from the provision of cremation services above that which could be earned in a competitive environment.

As part of its review for NCP compliance, the Government undertook a review of the cemetery sector. Broadly, the review found and the Government confirmed that the cemetery sector was managed to allow cross-subsidisation of uneconomic cemeteries and operations through profitable ones.

*... the Government's position is that it is against the public interest to allow the profitable area of cremations to be opened up to the private sector and to thereby reduce the income available to cemetery trusts that have the responsibility for providing funds for the maintenance and operations of Victorian cemeteries in perpetuity.*

*The Government response has previously noted that there is no obvious alternative to the current system of cross subsidisation of cemeteries and crematoria that does not involve either:*

- *an additional financial burden on the Victorian public purse through Government financial support for cemeteries, or*

- *redistribution of funds from the holdings of cemetery trusts with large financial reserves, that would seriously compromise the long term financial viability of these major metropolitan cemetery trusts; or*
- *the imposition of a new levy on every burial or cremation.*<sup>68</sup>

As it is explicit Government policy to meet the perpetual maintenance obligation through internal funding, our finding does not provide any further evidence of a contravention of this aspect of the CPA.

Of interest for reducing competition between Trusts is s. 44 of the new Act which allows Trusts to reduce or waive any charge *only* on grounds of extreme hardship or other special circumstance. This would appear to preclude Trusts charging below their listed price.

### Competitive Neutrality

*3.(1) The objective of competitive neutrality policy is the elimination of resource allocation distortions arising out of the public ownership of entities engaged in significant business activities: Government businesses should not enjoy any net competitive advantage simply as a result of their public sector ownership. These principles only apply to the business activities of publicly owned entities, not to the non-business, non-profit activities of these entities.*

There is no evidence that cremation activities are being subsidised (either explicitly or as a result of advantages arising from public ownership) by other activities. In fact, cremation services are being priced (and therefore achieving returns) above that that might occur under a competitive environment. It is therefore difficult to identify how a private provider in NSW and SA could make a CN complaint based on disadvantage from public ownership of crematoria in Victoria.

However, as noted above government policy is for Trusts to obtain higher returns from cremations to meet their on-going maintenance needs. A separate issue is to ensure that these higher earnings achieved in crematoria in Victoria do not impact on the prices of services that Trusts provide in competition with private suppliers.

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<sup>68</sup> Victorian Government (2001) *National Competition Policy Review of the Cemeteries Act 1958 – Government Response*, pp. 16-17.



## 12. Assumptions & Limitations

The following section summarises assumptions and limitations of the current study.

### 12.1. Methodology

- The methodology is based upon an economic/financial analysis of both individual crematoria and of the ‘cremation industry’. Although this methodology is based on a rigorous analysis of demand across the State, it does not include representation of non-financial/economic goals. For example, a separate goal of policy may be to subsidise a facility where there are these other non-economic goals or to adopt a beggar-my-neighbour policy that causes overall detriment to the industry. Such an approach is outside the scope of this project that seeks to examine crematoria and industry options in terms of financial/economic viability.
- The use of internal rate of return is subject to the normal limitations associated with the IRR method; in particular, relatively high rates of return due to assumption of reinvestment of cash flows at the IRR (as apposed to assuming reinvestment of cash flows at opportunity cost)<sup>69</sup>.
- A planning horizon of 2051 has been adopted for this assessment.
- The analysis was undertaken using the Australian Bureau of Statistics (ABS) Statistical Local Area as defined at the 2001 Census (referred to as “SLAs” in this report) as a base spatial unit. There are some 196 SLAs within Victoria of widely varying size. To address these differences, some of the measures presented in this report have been converted into ‘density’ indices (for example, thousands of deaths per square kilometre).
- This study assumes the continuation of current government policy regarding the structure and regulation of the Victorian death care industry.

### 12.2. Analysis of Demand for Cremation Services

- The ‘medium’ mortality rate has been used as the most likely assumption, as adopted by the Victorian Government.
- Much of the analysis is based upon the existing average cremation rate (‘low rate’).

### 12.3. Viability of Current Proposals

- An analysis of the Preston Council’s proposed crematorium (within the building for its new mausoleum) has been undertaken. However, this is limited by the fact that no detailed information was forthcoming.

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<sup>69</sup> See, for example, Kelleher & MacCormack (2004). “Internal Rate of Return: A Cautionary Tale”. *McKinsey Quarterly*, August 2004.

## 12.4. Comparisons with Other Jurisdictions

The following limitations are noted with regards to the information presented in Section 6.6 on cremation outside Victoria:

- The information is a useful ‘snapshot’, but not intended to be read as a thorough investigation, which would constitute a significant study in its own right.
- The *costs* associated with cremation are but one factor in the *pricing* considerations of Victorian Cemetery Trusts.
- Without more detailed investigation of the costing and ownership structures in other jurisdictions, any comparisons must be used with caution.
- Concerns regarding ‘commercial confidentiality’ of crematorium cost and operational information have become more prevalent in Australia in the past 20 years<sup>70</sup>. This phenomenon occurs with public sector as well as private operators.
- The industry is increasingly dominated by private operators, who generally are less willing to provide specific information and have less time to do so.
- The strict confidentiality conditions under which the current study has operated (and its central focus on financial viability) is a significant factor which impeded the collection of information outside Victorian Cemetery Trusts. Collection of useful financial data is limited without an exchange of information.

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<sup>70</sup> Ivan Weber, CEO Woronora Crematorium (NSW).