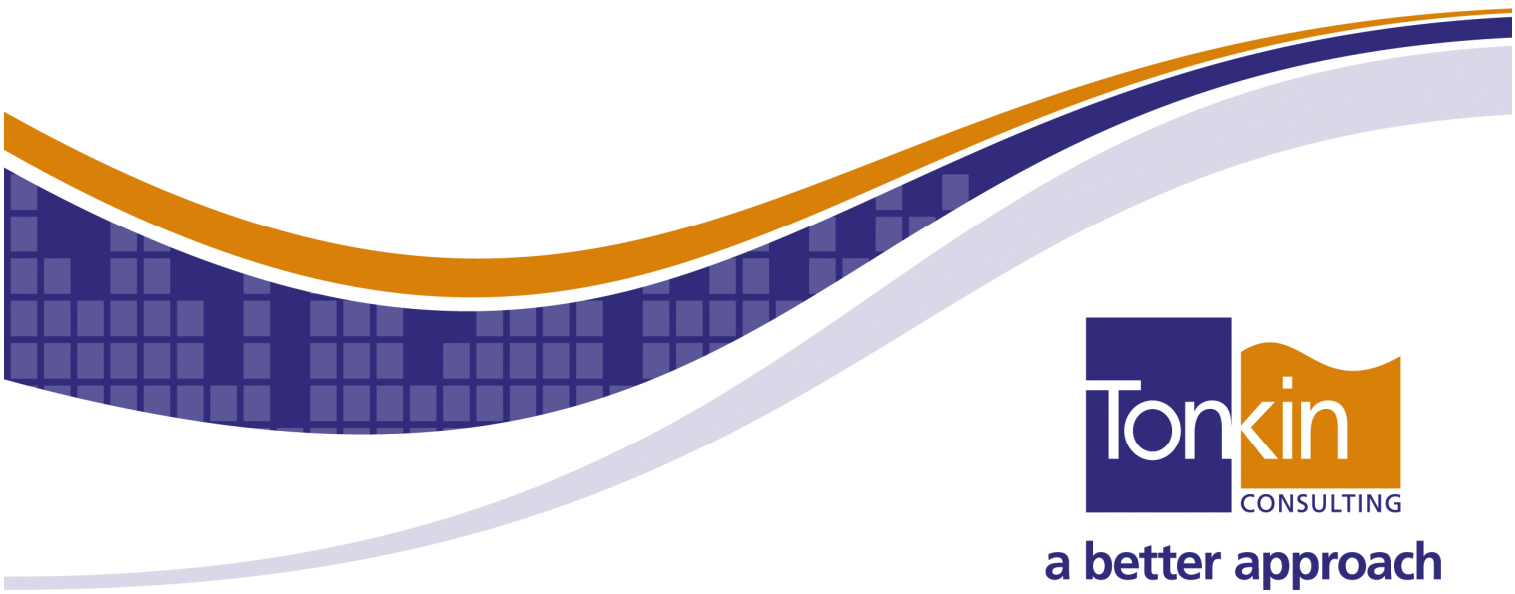
Infrastructure Assets Useful Lives

SA Councils' Current Practices

Local Government Association of SA

May 2014

Ref No. 20110640FR1C



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a better approach

Document History and Status

Rev	Description	Author	Reviewed	Approved	Date
A	For Client Comment	EM/RKE	RKE	RKE	4/04/2014
B	Final with comment from LGA	EM/RKE	JC	RKE	16/5/2014
C	Final	EM/RKE	RKE	RKE	19/5/2014

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1 Introduction

The LGA initially approached Tonkin Consulting in 2012 with a request to undertake a process similar to that undertaken previously in 2008, to prepare a report detailing the current practices of South Australian councils relating to the useful lives of infrastructure assets which expanded on the work that had previously been undertaken.

In 2013, Tonkin Consulting prepared a questionnaire for the LGA to issue to a selection of councils. This data together with data held in house by Tonkin Consulting for various local government clients was collated and analysed in two phases.

Phase 1 was undertaken in order to review and analyse all data provided by the recipients of the survey.

Phase 2 involved an industry briefing arranged by the Institute of Public Works Engineering Australasia (IPWEA) (SA division) / LGA and supported by the Financial Management Group, where the results were presented and workshops were convened to discuss the recommendations of the survey findings.

This report details the findings on the data collected including basic statistical analysis on the useful lives that are currently used, service standard levels and asset residual values.

2 Background

In 2008 the LGA approached Tonkin Consulting to produce a report that detailed the current practices of Councils and document the useful lives currently being adopted for various asset classes at the time. The report (Tonkin Report 2008.0277RA1) was intended to be a useful reference document to compare Councils' current practices and would highlight any areas where an individual Council may wish to review its practices. This would in turn lead to greater consistency between all South Australian Councils assigning useful lives to road surfaces, road pavements, footpaths, kerbs and gutters, storm water and Community Wastewater Management Systems (CWMS).

There were a few downfalls with the 2008 report which included; small sample numbers (generally less than 12) and a lack of data at the component level, which highlighted the need to increase the number of Councils contributing. The aim for this report was to make the necessary improvements to engage more Councils, gain more information and from analysis of results be able to provide a report which allows Councils to benchmark their own assignment of useful life for assets against other Councils and regions in the state.

It was proposed that a similar process to that undertaken previously in 2008 be adopted with Tonkin Consulting which involved making use of both in house knowledge and consulting with South Australian Councils. The process undertaken in 2013 was similar in that a questionnaire was created to obtain external information and the survey was expanded to include more Councils in different areas.

The councils surveyed have been geographically grouped as follows: Eyre Peninsula, Spencer Gulf, Central regions, small and large Metro, Southern Hills, Murray and Mallee, and the South East Councils.

In 2013, a total of 14 councils responded to the survey. Tonkin Consulting was able to get access to data for a further 17 more councils through access to data housed on Tonkin hosted server sites. This brought the total number of participating councils for this report to 31, which was more than double that of the responses to the survey in 2009 (see Table 1.1 below).

Table 2-1 Summary of Survey Responses for 2009 and 2013

	2009	2013
Large metro	2	7 (7)
Small medium metro	5	5 (1)
Central	2	8 (4)
EP	1	3 (0)
Murray and Mallee	1	2 (0)
Southern Hills	2	3 (1)
Spencer Gulf	1	2 (0)
South East	0	1 (1)
Total	14	31 (14)

The intentions of this report is to use an increased sample size to gain a better understanding of the application of useful life by SA Councils, begin to gain an understanding on the use of residuals and the rationale behind using residuals, to incorporate level of service to develop an understanding on the relationship between service levels and useful life, and to provide some reasonableness behind the differences between Councils.

3 Methodology

3.1 Overview

The approach adopted by Tonkin Consulting as part of this study includes:

1. Review existing in-house data to determine what information and for what Council it is available for
2. Prepare a questionnaire based on the 2008 questionnaire to enable data to be sourced from approximately 30 councils
3. Review sourced data and collate from all councils that respond
4. Undertake basic statistical analysis on the data collected
5. Summarise findings and document current practice based on data received
6. Present the results to an industry briefing and workshop in December 2013
7. Report on the findings and reasonableness of useful life, service levels and residuals differences between Councils.

3.2 Depreciation Method

Whilst there are several approaches to calculating depreciation, the International Infrastructure Manual 2006 states “Where the pattern of economic consumption does not materially differ from straight line, or where the pattern cannot be reasonably determined and demonstrated, straight line depreciation is considered a reasonable assumption.” The (2008) LGA Information Paper generally supports this approach provided useful lives and residual values of assets are reliable and regularly updated, component parts of the assets are recognised and depreciated separately and frequent revaluations of assets occur. Therefore straight line depreciation has been used as the basis of comparing the depreciation rates of Councils for the purposes of this report. It is acknowledged that there are also other valid methods that may be appropriate for calculating depreciation.

In straight line depreciation the cost of the asset is apportioned equally over its life. Therefore the rate of depreciation will be expressed as a function of useful life for the purposes of this report.

A questionnaire sent to Councils asked for the useful life of the various asset classes. The useful life of an asset is the life assigned to an asset for accounting purposes and is a measure of how long an asset is expected to continue to provide the required service.

4 Data Collected and Results

4.1 Data Received

All 68 Councils were approached and asked to participate in the survey, and 14 of these Councils responded and supplied useful lives, residual value and service levels where applicable to their assets. A further 17 Councils provided useful life data as accessible by Tonkin Consulting Hosted Services. These Councils included in the survey are geographically distributed as follows:

- 7 large Metropolitan Councils
- 5 small Metropolitan Councils
- 8 Central region Councils
- 3 Eyre Peninsula Councils
- 2 Murray and Mallee Councils
- 3 Southern Hills Councils
- 2 Spencer Gulf Councils
- 1 South East Council.

Of the Councils that did respond not all completed each section of the survey and the reasons for this were:

- Not all Councils possessed each asset type – i.e. some metropolitan Councils do not have sheeted roads
- Not all Councils breakdown their asset lives in separate components – i.e. pump stations are treated as one asset rather than treating the pumps, chamber etc. as separate assets
- Data accessibility from Tonkin Hosted sites was limited to useful life and residuals
- Some Councils have incomplete asset registers.

A summary of the responses is provided in the following sections with the minimum, maximum and average useful lives noted for each asset. Information on residuals is provided (if applicable) as well as general observations regarding the raw data.

Service level ratings are provided in a table along with the statistical values for the useful life values. In terms of service levels, councils were asked to put a number between 1 and 3 against both their Service Level Standard and Management Level Standard for each asset type.

The ratings correspond to the level of service that a Council provides for that asset – see below:

Service Standard Level:

1. 1 = High Service Standard
2. 2 = Acceptable Service Standard
3. 3 = Low Service Standard.

Service Management Level:

1. 1 = Optimum Service Level Management
2. 2 = “Too late” Service Level Management
3. 3 = “Too early” Service Level Management.

4.2 Road Surfaces

Councils were asked to provide the useful life for both urban and rural sealed and unsealed road surfaces. This provides the opportunity to contrast the consumption of road surfaces in built up and not built up areas.

4.2.1 Urban Surfaces

Three common sealed surfaces were considered viz. spray seal, hotmix and slurry seal/cold overlay. Councils were asked to provide a useful life for both normal and high use surfaces. A high use surface would be a road that has more traffic than a typical road in that area, i.e. a main street or freight route. Responses were also received for use of residuals and service levels. The results are presented below.

Urban Spray Seal

The results for spray seals are presented in Table 4.1 below.

Table 4-1 Urban Sealed Surfaces – Spray Seal

Urban Sealed Surface Type	Useful Life (Years) - Normal Use			Useful Life (Years) - Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Spray Seal	15	33	22	12	28.5	21	29	19	1	10	0	5	6	0

There is a significant range between minimum and maximum useful lives up to twice the minimum life.

Upon review of the data, the following observations are made from the raw data:

- Of the 29 responses of normal use spray seal, 6 councils reported life less than 16 years. 4 of them were in Metro Adelaide and 2 in the regions.
- Of the 29 responses for normal use spray seal, 3 councils reported life 30 years and above, 2 of them were in Metro Adelaide and 1 in the regions.
- The remaining 20 sites were typically reporting life in the range of 17-28 years.

Responses:

Of the 31 councils, 29 responded to using spray seals and 19 differentiated lives between normal use and heavy use.

Residuals:

Of the 31 responses to the survey the following summarises the use of residuals.

- 5 reported residuals between 38-45%.
- 1 reported a residual of 5%.
- 25 had no residual or did not complete.

Those that reported using residuals generally indicated there was a cost difference between the renewal treatment and original treatment (e.g. 1 coat seal renewal and 2 coat seal original construction). Also, valuers and consultants have been used by Councils in determining residual values.

Service Levels:

With respect to service levels the following is reported for the 11 councils out of 29 that reported of service levels.

Service Standard – the overwhelming response was acceptable service levels, with 1 response high service, zero with low service.

Service Management – the responses were split evenly between optimum service management and "too late" service management. No response was reported for "too early" service management.

Summation:

There is a wide range of useful life being used by councils between 12 years for heavy use spray seal to 33 years for normal use spray seal.

Residuals are not widely used and service levels are reported as generally acceptable.

Further work is needed in establishing if it is appropriate to assign residuals to spray seals.

The variation in life can be explained in part though the differences in approach in metropolitan councils and rural councils, where regional councils tend to extend the life in between reseals.

From the survey response, useful life ranges between 18-25 years are typical and those councils that report less than or more than this could review what is reported to ensure it relates with local communities.

Urban Cold Overlay

The results for cold overlay surfaces are presented in Table 4.2 below.

Table 4-2 Urban Sealed Surfaces – Cold Overlay

Urban Sealed Surface Type	Useful Life (Years) - Normal Use			Useful Life (Years) - Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Cold Overlay	7	25	17	10	22.5	17	15	10	1	7	0	3	5	0

There is a significant range between minimum and maximum useful life for both a normal and a heavy use road. The average useful life however remains the same.

The following observations are made from the raw data:

- 15 out of the 31 councils surveyed reported cold overlay normal use roads, and 10 councils reported cold overlay heavy use roads.
- Of the 15 responses for normal use cold overlay, 1 response reported a useful life of less than 15 years (large metro council), 6 out of the remaining 14 reported a useful life of 15 years (both metro and regional councils), 5 councils reported useful life greater than 20 years (1 small metro and 4 regional).
- Of the 10 responses for heavy use cold overlay, only 2 responses reported a useful life of less than 15 years (Hills and regional council), 3 responses reported 15 years and the remaining 5 responses ranged between 15 and 23 years.

Responses:

Of the 31 councils, 15 responded to using normal use cold overlay and 10 responded to heavy use.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals.

- 13 responses reported no residual.
- 18 councils had no response.

Service Levels:

With respect to service levels the following is reported for the 8 councils out of 15 that reported service levels.

Service standard – the overwhelming response was acceptable service levels, with only 1 response at a high level but none reported at a low service level.

Service management – 5 councils responded with too late service management and 3 responded with optimum service management. No councils responded at having "too early" service management.

Summation:

There is a wide range of useful life values, with a minimum of 7 years and a maximum of 25 years for the normal use cold overlay. (A minimum of 10 years and a maximum of 22.5 for the heavy use cold overlay). However, the average useful life for both a normal use and heavy use road remained the same.

Residuals are not generally applied to cold overlays. Service levels are reported as generally acceptable for most councils that responded.

Urban Hotmix

The results for hotmix are presented in Table 4.3 below.

Table 4-3 Urban Sealed Surfaces - Hotmix

Urban Sealed Surface Type	Useful Life (Years) - Normal Use			Useful Life (Years) -Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Hotmix	15	35	26	15	40	24	24	18	2	8	0	4	6	0

There is at least a 20 year difference between the minimum and maximum values for both a normal and heavy use hotmix roads. The average for both is similar.

The following observations are made from the raw data:

- 24 out of the 31 councils surveyed reported hotmix roads for normal use and 18 of the councils reported hotmix roads for heavy use.
- Of the 24 responses for normal use hotmix, 1 response reported a useful life of less than 20 years (large metro council), 14 of the remaining 23 responses were between 20-25 years and the remaining 9 responses were between 25-35 years.

- Of the 6 large metro council's that responded, 4 gave a consistent useful life of 25 years for normal use. Likewise with the central region councils, where 4 out of 5 responses reported a consistent useful life of 25 years for normal use hotmix.
- Of the 18 responses for heavy use hotmix, 1 response gave a useful life of less than 20 years (large metro council), 5 responses gave a useful life of 20 years (large metro, small metro and hills), and the remaining 11 responses gave a useful life between 20 and 30 years. One small metropolitan council reported 40 years.

Responses:

Of the 31 councils, 24 responded for normal use hotmix roads and 18 responded for heavy use hotmix roads.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 1 response had a 60% residual.
- 21 councils had no residual.
- 9 councils had no response.

Service levels:

With respect to service levels the following is reported for the 10 councils out of 24 that reported service levels.

Service standard - the majority response was acceptable service levels, with only 2 responses at a high level and no low service level.

Service management – the responses were split between optimum and "too late" service management. No councils responded at having "too early" service management.

Summation:

There is a wide range of useful life values, with a minimum of 15 years for both normal and heavy use hot mix roads. The maximum useful lives for normal and heavy use only differed by 5 years, being 35 years and 40 years respectively.

The average useful lives for normal use and heavy use hotmix roads were similar (26 and 24 years respectively).

Only one response reported a residual. Service levels are reported as generally acceptable for most councils that responded.

Unsealed Surface – Urban Sheeted

Responses were only provided for a normal use unsealed urban sheeted road and the results are presented in Table 4.4 below.

Table 4-4 Urban Unsealed Surfaces – Urban Sheeted

Urban Unsealed Surface Type	Useful Life (Years) - Normal Use			Useful Life (Years) - Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Urban sheeted	10	30	18	-	-	-	24	-	0	5	2	3	4	0

There is a 20 year difference between the minimum and maximum values of responses for a normal use urban sheeted road.

The following observations are made from the raw data:

- Of the 31 councils surveyed, 24 councils reported unsealed urban sheeted surface roads for normal use.
- Of the 24 responses, only 7 reported a useful life of less than 15 years and those responses were across all council types. 5 responses had a useful life of greater than 20 years. The remaining 12 responses ranged between 15 and 20 years.

Responses:

Of the 31 councils, 24 responded for unsealed urban sheeted road for normal use. There were no reports of heavy use roads.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 3 responses had residuals of between 40-45%
- 2 responses had residuals of between 30-40%
- 7 responses had residuals of between 20-30%
- 2 responses had residuals less than 20%
- 8 responses had no residual
- 9 councils had no response.

Service levels:

With respect to service levels the following is reported for the 7 councils out of 24 that reported service levels.

Service standard – the majority response was acceptable service levels, however 2 responded with a low service level and there were zero at a high service level.

Service management – the responses were split between optimum and “too late” service management. No councils responded at having “too early” service management.

Summation:

There is a range of useful life values, with a minimum of 10 years and a maximum of 30 years for the normal use urban sheeted roads.

12 responses had a significant residual, with 8 councils reporting no residual and 10 councils that did not report a residual. Service levels are reported as generally acceptable for most councils that responded however there were a number of councils that reported a low service level.

4.2.2 Rural Sealed Surfaces

Rural sealed surfaces were treated in a similar way to urban sealed roads.

Rural Spray Seal

The results for a rural spray seal surface are presented in Table 4.5 below.

Table 4-5 Rural Sealed Surfaces – Spray Seal

Rural Sealed Surface Type	Useful Life (Years) - Normal Use			Useful Life (Years) - Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Spray Seal	15	30	21	15	25	19	21	16	0	7	0	4	3	0

There is a significant range between the reported minimum and maximum useful life for both a normal and a heavy use road for a rural spray seal surface. The average useful life however, remains similar (21 and 19 respectively).

The following observations are made from the raw data:

a) Only 21 out of the 31 councils surveyed have rural spray seal normal use roads, and 16 of these councils have rural spray seal heavy use roads
b) Of the 21 responses for rural spray seal normal use, only 2 responses gave a normal life of exactly 15 years (central and small metro council's), while the remainder of the responses were all greater than 15 years
c) Of the 16 responses for rural spray seal heavy use, only 2 responses gave a normal life of exactly 15 years (Eyre Peninsula and Spencer Gulf councils), while the remainder of the responses were all greater than 15 years
d) Generally, small and large metro council's did not report on rural spray seal roads.

Responses:

Of the 31 councils, 21 responded to using normal use spray seal but only 16 responded to heavy use.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 4 responses had residuals of between 40-50%
- 3 responses had residuals of between 0-30%
- 1 response had a residual less than 20%
- 14 responses had no residual
- 9 councils had no response.

Service levels:

With respect to service levels the following is reported for the 7 councils out of 21 that reported service levels.

Service standard – all 7 councils reported acceptable service levels.

Service management – the responses were split between optimum and "too late" service management. No councils responded at having "too early" service management.

Summation:

There is a range of useful life values, with a minimum of 15 years and a maximum of 30 years for the normal use rural spray seal roads.

A slightly smaller range of useful life values of between 15 and 25 years existed for the heavy use rural spray seal roads. A minimum useful life of 15 years also existed for heavy use roads.

4 responses had significant residual of between 40-50%, with a total of 8 councils having a residual value. 14 responses had no residual, and 11 councils had no response.

Service levels are reported as acceptable for all councils that responded. Councils reported either optimum service management or "too late" service management.

4.2.3 Rural Cold Overlay

The results for a rural cold overlay surface are presented in Table 4.6 below.

Table 4-6 Rural Sealed Surfaces – Cold Overlay

Rural Sealed Surface Type	Useful Life (Years) - Normal Use			Useful Life (Years) - Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Cold Overlay	16	25	20	16	25	20	4	4	0	3	0	1	2	0

There is at least a 9 year difference between the minimum and maximum values for both a normal and heavy use rural cold overlay road. The average for both is 20 years.

The following observations are made from the raw data:

- 4 out of the 31 councils surveyed reported rural cold overlay roads for normal use and for heavy use.
- Of the 4 responses for normal use cold overlay, all responses reported a useful life greater than 15 years (Metropolitan, Hills and Central councils).
- Of the 4 responses for heavy use cold overlay, all responses reported a useful life greater than 15 years (Metropolitan, Hills and Central councils).

Responses:

Of the 31 councils, 4 responded for normal use cold overlay roads and 4 responded for heavy use cold overlay roads.

Residuals:

No residuals were reported for the rural cold overlay roads.

Service levels:

With respect to service levels the following is reported for the 3 councils out of 4 that reported service levels.

Service standard – the response from all 3 councils was an acceptable service level.

Service management – 1 response was optimum service management and the other 2 responses were "too late" service management.

Summation:

The sample size was small for rural sealed surface cold overlay as only 4 councils out of 31 responded.

The minimum, maximum and average useful lives for both a normal use and heavy use rural cold overlay road were identical (16, 25 and 20 years respectively).

No residuals were reported for this road type.

Service levels are reported as acceptable for the councils that responded. One council reported optimum service management whilst the others reported “too late” service management.

Rural Hotmix

The results for a rural hotmix surface are presented in Table 4.8 below.

Table 4-7 Rural Sealed Surfaces - Hotmix

Rural Sealed Surface Type	Useful Life (Years) - Normal Use			Useful Life (Years) - Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Hotmix	17	30	24	17	25	22	12	8	1	5	0	3	3	0

There is a 13 year difference between the minimum and maximum useful life values for a rural normal use hotmix road. There is an 8 year difference between the minimum and maximum useful life values for a rural heavy use hotmix road. The average useful life for a normal and heavy use road is 24 and 22 years respectively.

The following observations are made from the raw data:

- 12 out of the 31 councils surveyed reported for rural normal use hotmix roads and 8 of the councils reported rural heavy use hotmix roads.
- Of the 12 responses for rural normal use hotmix, 1 council reported a useful life of less than 20 years (17 years, Hills council). The other responses reported a useful life of between 20-30 years. The Spencer Gulf and Murray councils reported the highest useful life values.
- Of the 8 responses for rural heavy use hotmix, 1 council reported a useful life of less than 20 years (17 years, Hills council). The other responses reported a useful life of between 20-30 years. The Spencer Gulf and Murray councils reported the highest useful life values.

Responses:

Of the 31 councils, 12 responded for rural normal use hotmix roads and 8 responded for rural heavy use hotmix roads.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 1 response had a 40-50% residual.
- 11 councils had no residual.
- 19 councils had no response.

Service levels:

With respect to service levels the following is reported for the 6 councils out of 12 that reported service levels.

Service Standard – the majority of the response was acceptable service levels, with only 1 response at a high level.

Service Management – the responses were evenly split between optimum and "too late" service management. No councils responded at having "too early" service management.

Summation:

There is a wide range of useful life values, with a minimum of 17 years for both normal and heavy use rural hotmix roads. The maximum useful lives for normal and heavy use differed by 5 years, 30 and 25 years respectively.

The average useful lives for normal use and heavy use hotmix roads were similar (24 and 22 respectively).

Only one council reported a residual of between 40-50%. Service levels are reported as generally acceptable for most councils that responded. Service management levels were divided between optimum and "too late" service management.

4.2.4 Rural Sheeted Roads

Rural sheeted roads for the purposes of this study have been reported in terms of a typical road hierarchy commonly used in regional areas.

For rural sheeted roads the life often depends on the quality of the material used, the usage measured in vehicles per day (vpd), and based on the following hierarchy:

- Rural Arterial >100 vpd
- Rural Collector 50-100 vpd
- Rural Local 10-50 vpd
- Rural Track <10 vpd

4.2.4 (a) Rural Sheeted Arterial

The results for a rural arterial road are presented in Table 4.8 below.

Table 4-8 Rural Sheeted Road – Rural Arterial

Rural Sheeted Surface Type	Useful Life (Years) – Poor Material			Useful Life (Years) – Good Material			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Poor Material	Good Material	1	2	3	1	2	3
Rural Arterial	6	20	12	8	24.5	14	11	17	2	4	0	3	3	0

There is a significant range between minimum and maximum useful life values for both poor and good material rural arterial roads. The average useful life for both poor and good material types is similar (12 and 14 respectively).

The Central region councils reported both good and poor material, while 1 council in the Murray region, 1 in the Southern Hills and 1 in the Eyre Peninsula reported poor material. 1 South east, 3 Southern Hills, 2 Eyre Peninsula, 3 Murray and 1 Spencer Gulf Council reported good material.

The following observations are made from the raw data:

a) Only 11 out of the 31 councils surveyed have poor material rural arterial roads, and 17 councils have good material rural arterial roads.

b) Of the 11 responses for poor material rural arterial roads, 3 different regional councils responded with a useful life of 10 years or less. The central councils responded with a range of useful life values between 6 and 20 years.

c) 5 out of 7 Central councils responded with a range of 10-12 years for good material whilst the other 2 were in the 15-20 year range. Councils in other regions varied: Eyre Peninsula reported 1 at 20 years and 1 at 15 years, the Murray councils reported 2 in the 15-20 year range and 1 at 10 years, the South East reported 20 years, the Southern Hills reported 1 at 24 years and 2 between 8-13 years, and the Spencer Gulf council reported 1 at 10 years.

d) Of the 17 responses for good material rural arterial roads, 4 different regional councils reported a useful life of 10 years or less. The useful lives ranged from 10-20 years. The maximum useful life of 24.5 years was reported by an Adelaide Hills council.

e) Generally, small and large metro councils did not have rural arterial sheeted roads.

Responses:

Of the 31 councils, 11 responded to using poor material for rural arterial roads and 17 responded to using good material for rural arterial roads.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 4 responses had residuals of between 40-50%
- 1 response had a residual of between 30-40%
- 6 responses had residuals of between 20-30%
- 1 response had a residual of less than 20%
- 5 responses had no residual
- 14 councils had no response.

Service levels:

With respect to service levels, the following is reported for the 6 councils out of 17 that reported service levels.

Service Standard – the majority of councils reported an acceptable service level and 2 reported a high service level. There were no low service standard ratings given.

Service management – the responses were evenly split between optimum and “too late” service management. No councils responded at having “too early” service management.

Summation:

There is a range of useful life values reported by the Central councils for a poor material rural arterial road. The number of responses was greater for good material rural arterial roads than for those composed of poor material.

The minimum, maximum and average useful life values for a good material rural arterial road were all higher than the values given for a poor material rural arterial road.

12 councils in total reported residual values, 22 councils reported either no residual or had no response.

No low service standard or too early service management types were reported.

4.2.4 (b) Rural Sheeted Collector

The results for a rural collector road are presented in Table 4.9 below.

Table 4-9 Rural Sheeted Road – Rural Collector

Rural Sheeted Surface Type	Useful Life (Years) – Poor Material			Useful Life (Years) – Good Material			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Poor Material	Good Material	1	2	3	1	2	3
Rural Collector	10	26	16	10	31.5	19	12	18	0	6	0	4	2	0

There is a large range (approximately 16 years) for the minimum and maximum useful life values between the poor and good material rural collector roads. The average useful life for a good material road is slightly higher than for a poor material road (19 years and 16 years respectively). A similar trend is seen in the use of good/ poor material as arterial roads.

The following observations are made from the raw data:

- 12 out of the 31 councils surveyed reported for a poor material rural collector road and 18 of the councils reported for a good material rural collector road.
- Of the 12 responses for a poor material rural collector road, all responses reported a useful life of 10 years or greater. The Central councils reported a range of useful lives from 11 to 24 years. A Hills council reported the maximum useful life of 26 years.
- Of the 18 responses for a good material rural collector road, all responses reported a useful life of 10 years or greater. The majority of responses reported a useful life in the range from 12-25 years. A Hills council reported the maximum useful life of 31.5.

The small and large metropolitan councils do not have any rural collector roads. The Murray, Hills and Spencer Gulf councils have more good material rural collector roads than poor material types.

Responses:

Of the 31 councils, 12 responded for poor material rural collector roads and 18 responded for good material rural collector roads.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 2 responses had a 40-50% residual
- 3 responses had a 30-40% residual
- 7 responses had a 20-30% residual
- 1 response had a residual less than 20%
- 5 responses had no residual
- 13 councils had no response.

Service levels:

With respect to service levels the following is reported for the 6 councils out of 18 that reported service levels.

Service standard – all councils that responded reported acceptable service levels.

Service management – the responses were split between optimum and "too late" service management. No councils responded at having "too early" service management.

Summation:

There is a range of useful life values with a minimum of 10 years for both poor and good material rural collector roads. The maximum and average useful lives are slightly higher for a good material road than a poor material road.

13 councils reported a residual for a rural collector road, whereas 19 reported either no residual or no residual.

Service levels were all reported as acceptable levels for the councils that responded. Service management responses were all reported as either optimum or "too late" service management.

4.2.4 (c) Rural Sheeted Local

The results for a rural local road are presented in Table 4.10 below.

Table 4-10 Rural Sheeted Road – Rural Local

Rural Sheeted Surface Type	Useful Life (Years) – Poor Material			Useful Life (Years) – Good Material			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Poor Material	Good Material	1	2	3	1	2	3
Rural Local	8	32	20	12	40	24	14	19	0	4	3	3	3	1

There is a wide range between minimum and maximum useful life values for both poor and good material rural local roads. The average useful life for both poor and good material types is similar (20 and 24 respectively).

The following observations are made from the raw data:

- Only 14 out of the 31 councils surveyed have poor material rural local roads, and 19 councils have good material rural local roads.
- Of the 14 responses for poor material rural local roads, one council reported a useful life of less than 10 years (small metro). The central councils responded with a range of useful life values between 12 and 30 years. The maximum useful life of 32 years was reported by an Adelaide Hills council.
- Of the 19 responses for good material rural local roads, two councils reported a useful life of less than 15 years (small metro and Spencer Gulf). The useful life for the remaining councils ranged from 15-35 years. The maximum useful life of 40 years was reported by a Murray council.

Generally, small and large metro council's did not have rural local roads. However, one small metro council did have rural local roads of both poor and good material.

Responses:

Of the 31 councils, 14 responded to using poor material for rural local roads and 19 responded to using good material for rural local roads.

Residuals:

- 1 response had a residual of between 40-50%
- 5 responses had residuals of between 30-40%
- 2 responses had residuals of between 20-30%
- 7 responses had residuals of less than 20%
- 5 responses had no residual
- 11 councils had no response.

Service levels:

With respect to service levels, the following is reported for the 7 councils out of 19 that reported service levels.

Service Standard – 4 of the 7 councils reported an acceptable service level but the remaining 3 councils reported a low service level. There were no high service levels given.

Service Management – 6 of the 7 councils were evenly split between optimum and "too late" service management. 1 council responded as having "too early" service management.

Summation:

There is a range of useful life values reported by the Central councils for both a poor and a good material rural local road.

The minimum, maximum and average useful life values for a good material rural local road were all higher than the values given for a poor material rural local road.

15 councils in total reported residual values, 17 councils reported either no residual or had no response.

No high service standards were given, however there were 3 councils of the 7 that reported that responded with a low service standard.

In terms of service management, apart from the 1 council that reported as having "too early" service management, the councils that responded had either optimum or "too late" service management.

4.2.4 (d) Rural Sheeted Track

The results for a rural track road are presented in Table 4.11 below.

Table 4-11 Rural Sheeted Road – Rural Track

Rural Sheeted Surface Type	Useful Life (Years) – Poor Material			Useful Life (Years) – Good Material			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Poor Material	Good Material	1	2	3	1	2	3
Rural Track	20	40	27	20	50	31	8	11	0	4	1	2	3	1

There is a large range of 20 years between the minimum and maximum useful life values for the poor material rural track road. There is a larger range of 30 years between the minimum and maximum useful life values for the good material rural track road.

The average useful life for a good material road is slightly higher than for a poor material road (31 years and 27 years respectively).

The following observations are made from the raw data:

- 8 out of the 31 councils surveyed reported for a poor material rural track road and 11 of the councils reported for a good material rural track road.
- Of the 8 responses for a poor material rural track road, all responses reported a useful life of 20 years or more. The highest useful life values were reported by a Hills council and a Murray council.
- Of the 11 responses for a good material rural track road, all responses reported a useful life of 20 years or more. The maximum useful life value of 50 years was reported by an Eyre Peninsula council.

Both small and large metro councils, as well as a couple of regional councils do not have rural track roads.

Responses:

Of the 31 councils, 8 responded for poor material rural track roads and 11 responded for good material rural collector roads.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 1 response had a 40-50% residual
- 5 responses had a 30-40% residual
- 2 responses had a 20-30% residual
- 7 responses had a residual less than 20%
- 5 responses had no residual
- 11 councils had no response.

Service levels:

With respect to service levels the following is reported for the 6 councils out of 11 that reported service levels.

Service standard – The majority of councils reported acceptable service levels, 1 council reported a low service level and no councils reported a high service level.

Service management – The majority of responses were split between optimum and “too late” service management. 1 council reported a “too early” service management.

Summation:

There is a range of useful life values with a minimum of 20 years for both poor and good material rural track roads. The maximum and average useful lives are slightly higher for a good material road than for a poor material road.

15 councils reported a residual for a rural track road, whereas 17 reported either no residual or had no response.

Service levels were reported as acceptable levels apart from one council that reported a low service level. Service management was reported as either optimum or "too late" service management level however, 1 council reported a "too early" service management level.

4.3 Road Pavements

The useful life for granular pavement materials relates only to pavements under sealed surfaces. It is anticipated that numerous reseals will be undertaken before the need to replace the pavement. It is anticipated that light residential streets will have longer life than the heavy trafficked industrial roads. Accordingly a normal and heavy use distinction has been made.

4.3.1 Urban Pavements

The results for an urban granular pavement are presented in Table 4.12 below.

Table 4-12 Urban Pavements - Granular

Road Pavement Type	Useful Life (Years) – Normal Use			Useful Life (Years) – Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Urban Granular Pavement	55	150	83	45	100	67	31	26	2	8	0	4	6	0

There is a large range between the minimum and maximum useful lives reported for both a normal use urban granular pavement (95 years) and a heavy use granular pavement (55 years). The average useful life for a normal use pavement is higher than for a heavy use pavement (83 years and 67 years respectively).

The following observations are made from the raw data:

- All 31 councils surveyed reported for a normal use urban granular pavement and 26 of the councils reported for a heavy use granular pavement.
- Of the 31 responses for a normal use urban granular pavement, all responses but 1 (large metro council) reported a useful life of 60 years or greater. The majority of responses were in the 80-100 year range. A few responses reported a useful life greater than 100 years (Eyre Peninsula and small Metro council's).
- Of the 26 responses for a heavy use urban granular pavement, the majority of responses were in the 45-80 year range. 3 responses reported a useful life greater than 80 years (small Metro council's).

The responses from the Central councils and small Metro council's for a heavy use granular pavement both reported a wide range of useful life values with the remainder of Councils ranging from a useful life of 50-80 years.

Responses:

Of the 31 councils, 31 responded for normal use urban granular pavement and 26 responded for heavy use urban granular pavement.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 3 responses had a 40-45% residual
- 8 responses had a 30-40% residual
- 10 responses had a 20-30% residual
- 4 responses had a residual less than 20%
- 6 responses had no residual
- All councils responded.

There was a consistent perspective that the cost to renew pavement by reusing the existing material helped keep costs lower.

Service levels:

With respect to service levels the following is reported for the 10 councils out of 31 that reported service levels.

Service standard – the majority of councils reported acceptable service standard levels, with 2 councils reporting high service standards. No councils responded at having low service standards.

Service management – the responses were split between optimum and "too late" service management. No councils responded at having "too early" service management.

Summation:

There is a large range of useful life values for both normal and heavy use urban granular pavements.

All councils reported a residual for an urban granular pavement. Of the responses, only 5 of these reported no residual.

Service levels were all reported as either acceptable or high. There were no low service standards. Service management responses were all reported as either optimum or "too late" service management levels.

4.3.2 Rural Pavements

The results for a rural granular pavement are presented in Table 4.13 below.

Table 4-13 Rural Pavements

Road Pavement Type	Useful Life (Years) – Normal Use			Useful Life (Years) – Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Rural Granular Pavement	20	85	68	20	90	52	18	16	1	3	1	2	3	0

There is a large range between the minimum and maximum useful lives reported for both a normal use rural granular pavement (65 years) and a heavy use granular pavement (70 years). The average useful life for a normal use pavement is higher than for a heavy use pavement (68 years and 52 years respectively).

The following observations are made from the raw data:

- 18 of the 31 councils reported for a normal use rural granular pavement and 16 of these reported for a heavy use granular pavement.
- Of the 18 responses for a normal use rural granular pavement, the majority of responses reported a useful life in the range between 50-80 years. A council in the south east reported the lowest useful life of 20 years. The central councils reported a range of useful life values between 50-95 years.
- Of the 16 responses for a heavy use rural granular pavement, the majority of responses reported a useful life in the range between 50-60 years. 1 council reported beyond this with a useful life of 90 years (Eyre Peninsula). 3 councils reported a useful life below 50 years with the south east council reporting the lowest useful life value of 20 years.

The useful lives given by the Central councils were generally consistent.

Responses:

Of the 31 councils, 18 responded for normal use rural granular pavement and 16 responded for a heavy use rural granular pavement.

Residuals:

Of the 31 responses to the survey, the following summarises the use of residuals:

- 7 responses had a 40-50% residual
- 6 responses had a 30-40% residual
- 2 responses had a 20-30% residual
- 2 responses had a residual less than 20%
- No responses had no residual
- 14 councils did not respond.

When compared to urban pavements the residuals are generally higher percentages, which is reasonable given the ability to reuse and build up rather than being constrained to levels in a kerbed road..

Service levels:

With respect to service levels the following is reported for the 5 councils out of 31 that reported service levels.

Service standard – the majority of councils reported acceptable service standard levels. 1 council reported a high service standard and 1 council reported a low service standard.

Service management – the responses were split between optimum and “too late” service management. No councils responded at having “too early” service management.

Summation:

Generally, there is a high range of useful life values for both normal and heavy use rural granular pavements. The average useful life values for both normal and heavy use are 68 years and 52 years respectively.

17 of the 31 councils reported a residual for a rural granular pavement and no councils reported as not having a residual.

The majority of service levels were reported as acceptable or high; however, 1 council reported a low service standard. Service management responses were all reported as either optimum or "too late" service management levels.

4.4 Footpaths

The useful life of a footpath may be determined based on the level of service Councils wish to provide for pedestrians with regard to aesthetics, trip hazard tolerances, etc. as well as physical condition. A summary of the responses received is provided below:

4.4.1 Footpaths - Paved

The results for a paved footpath are presented in Table 4.14 below.

Table 4-14 Footpaths - Paved

Footpath Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Paved Footpath	30	60	46	30	0	12	0	5	7	0

There is a 30 year difference between the minimum and maximum useful life values for a paved footpath. The average useful life is 46 years.

The following observations are made from the raw data:

- The majority of councils reported a useful life in the range of 40-50 years. 1 council reported a useful life less than 40 years (30 years, Murray council). 3 councils reported a useful life greater than 50 years (60 years, Central/ large and small Metro council)

Responses:

- Of the 31 councils, 30 responded to using paved footpaths.

Residuals:

- 3 responses had residuals of between 20-30%
- 1 response had a residual less than 20%
- 22 responses had no residual
- 5 councils had no response.

Service levels:

With respect to service levels, the following is reported for the 12 out of 30 that reported service levels.

Service standard – all councils reported acceptable service levels.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

Summation:

Of the 31 councils, all but one of the councils responded to having paved footpaths. The majority of councils that responded reported a useful life in the range of 40-50 years.

4 councils provided a residual value, while 28 had no residual or did not respond.

All service standards were reported as acceptable. The service management levels were reported as either optimum or "too late" service management.

4.4.2 Footpaths – Concrete

The results for concrete footpaths are presented in Table 4.15 below.

Table 4-15 Footpaths - Concrete

Footpath Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Concrete Footpath	40	80	54	29	0	9	1	2	8	0

There is a 40 year difference between the minimum and maximum useful life values for a concrete footpath. The average useful life is 54 years.

The following observations are made from the raw data:

- More than half of the councils reported a useful life of 50 years.
- 4 councils reported a useful life less than 50 years (both regional and metro council's).
- The majority of councils reported a useful life in the range of 40-50 years.
- 2 metro council's reported the largest useful life values (80 years), with the remaining 4 reporting life between 40-60 years.

Responses:

Of the 31 councils, 29 responded to using concrete footpaths.

Residuals:

- 1 response had a residual between 40-50%
- 1 response had a residual between 20-30%
- 1 response had a residual less than 20%
- 22 responses had no residual
- 6 councils had no response.
- The majority of councils view concrete footpaths as having no residual.

Service levels:

With respect to service levels, the following is reported for the 10 out of 29 that reported service levels.

Service standard – all councils but one, reported acceptable service levels. 1 council reported a low service standard level.

Service management – the majority of responses were "too late" service management with only 2 councils reporting optimum service management. No councils responded as having "too early" service management.

Summation:

Of the 31 councils, all but two of the councils responded to using concrete footpaths. The majority of councils that responded reported a useful life in the range of 40-50 years.

3 councils provided a residual value, while 29 had no residual or did not respond.

The majority of councils reported acceptable service levels and 1 council reported a low service level. The service management levels were reported as either optimum or "too late" service management.

4.4.3 Footpaths – Spray Seal

The results for a spray seal footpath are presented in Table 4.16 below.

Table 4-16 Footpaths – Spray Seal

Footpath Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Spray seal Footpath	15	50	23	23	0	7	1	2	6	0

There is a 35 year difference between the minimum and maximum useful life values for a spray seal footpath. The average useful life is 23 years.

The following observations are made from the raw data:

- The majority of councils reported a useful life in the range of 20-30 years.
- One council reported a useful life greater than 30 years (50 years, south east council)
- Three councils reported a useful life less than 20 years and these were reported at the minimum useful life of 15 years (Central, small metro and Spencer Gulf councils).

Responses:

Of the 31 councils, 23 responded to using spray seal footpaths.

Residuals:

- 1 response had a residual between 40-45%
- 3 responses had a residual between 20-30%
- 1 response had a residual less than 20%
- 16 responses had no residual
- 10 councils had no response.

Service levels:

With respect to service levels, the following is reported for the 8 out of 23 councils that reported service levels.

Service standard – the majority of councils reported an acceptable service level. One council reported a low service level.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

Summation:

Of the 31 councils, 23 responded to using spray seal footpaths. The majority of councils that responded reported a useful life in the range of 20-30 years.

5 councils provided a residual value, while 27 had no residual or did not respond.

The majority of service standards were reported as acceptable. The service management levels were reported as either optimum or "too late" service management.

4.4.4 Footpaths – Hotmix

The results for a hotmix footpath are presented in Table 4.17 below.

Table 4-17 Footpaths - Hotmix

Footpath Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Hotmix Footpath	20	50	28	27	1	10	0	4	7	0

There is a 30 year difference between the minimum and maximum useful life values for a hotmix footpath. The average useful life is 28 years.

The following observations are made from the raw data:

- The majority of councils reported a useful life in the range of 20-30 years.
- 5 councils reported the minimum useful life of 20 years (Metro, Murray and Hills councils).
- The south east council reported the maximum useful life of 50 years, whilst a council in the Eyre Peninsula reported the next highest useful life of 40 years.
- The Central councils were consistent with the useful life values they each reported (30 years).
- The Murray council reported 2 useful life values outside of the 20-30 year range (35 years).

Responses:

Of the 31 councils, 27 responded to using hotmix footpaths.

Residuals:

- 2 responses had a residual between 20-30%
- 2 responses had a residual less than 20%
- 20 responses had no residual
- 7 councils had no response.

Service levels:

With respect to service levels, the following is reported for the 11 out of 27 councils that reported service levels.

Service standard – the majority of councils reported an acceptable service level. One council reported a high service level.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

Summation:

Of the 31 councils, 27 responded to using hotmix footpaths. The majority of councils reported a useful life within the range of 20-30 years.

4 councils provided a residual value, while 28 had no residual or did not respond.

Of the 11 Councils that responded to service levels the majority of service standards were reported as acceptable. The service management levels were reported as either optimum or "too late" service management.

4.4.5 Footpaths – Crusher Dust

The results for a crusher dust footpath are presented in Table 4.18 below.

Table 4-18 Footpaths – Crusher Dust

Footpath Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Crusher Dust Footpath	5	40	16	24	0	6	1	2	5	0

There is a 35 year difference between the minimum and maximum useful life values for a crusher dust footpath. The average useful life is 16 years.

The following observations are made from the raw data:

- 5 councils reported a useful life of 10 years or less (Metro and Spencer Gulf council).
- 7 councils reported a useful life less than 15 years.
- 11 councils reported a useful life of 15 years (Murray, Metro, Central and Hills).

One Central council reported the largest useful life of 40 years. This was followed by a 35 year useful life reported by the South East council.

The majority of councils reported a useful life in the range of 10-15 years.

Responses:

Of the 31 councils, 24 responded to using crusher dust footpaths.

Residuals:

- 1 response had a residual of 63%
- 2 responses had a residual between 40-50%
- 3 responses had a residual between 20-30%
- 1 response had a residual less than 20%
- 14 responses had no residual
- 10 councils had no response.

Service levels:

With respect to service levels, the following is reported for the 7 out of 24 that reported service levels.

Service standard – the majority of councils reported acceptable service levels. 1 council reported a low service level.

Service management – the majority of responses reported "too late" service management with only 2 councils reporting optimum service management. No councils responded as having "too early" service management.

Summation:

Of the 31 councils, 24 responded to using crusher dust footpaths. The majority of councils that responded reported a useful life in the range of 10-15 years.

7 councils provided a residual value, while 25 had no residual or did not respond.

The majority of councils reported acceptable service levels and 1 council reported a low service level. The service management levels were reported as either optimum or "too late" service management.

4.5 Kerb and Gutter

A summary of the responses received for kerb and gutter is provided below.

4.5.1 Upright Concrete Kerbs

The results for upright concrete kerbs are presented in Table 4.19 below.

Table 4-19 Urban Concrete Kerbs - Upright

Concrete Kerb Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Upright	55	100	74	31	0	11	1	4	8	0

There is a 45 year difference between the minimum and maximum useful life values for an upright concrete kerb. The average useful life is 74 years.

The following observations are made from the raw data:

- Of the 31 councils that responded, 18 councils reported a useful life of 70 years (Central, Murray, small Metro and Hills).
- 2 councils reported a useful life greater than 80 years (100 years, Metro).
- One large metro council reported a useful life less than 60 years (55 years).

The majority of councils reported a useful life in the range of 60-80 years.

Responses:

- All 31 councils responded to using concrete upright kerbs.
- Residuals:
- 1 response had a residual of between 40-45%
- 1 response had a residual of between 20-30%

- 2 responses had a residual of less than 20%
- 27 responses had no residual
- All councils had a response.

Service levels:

With respect to service levels, the following is reported for the 11 out of 31 reported service levels.

Service standard – the majority of councils reported acceptable service levels. 1 council reported a low service standard.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

Summation:

All 31 councils participating in the survey responded to using upright concrete kerbs. The majority of councils that responded reported a useful life in the range of 60-80 years.

4 councils provided a residual value, while 27 had no residual. All councils responded.

The majority of service standards were reported as acceptable. The service management levels were reported as either optimum or "too late" service management.

4.5.2 Median Concrete Kerbs

The results for median concrete kerbs are presented in Table 4.20 below.

Table 4-20 Urban Concrete Kerbs - Median

Concrete Kerb Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Median	40	100	70	28	1	10	0	5	6	0

There is a 60 year difference between the minimum and maximum useful life values for a median concrete kerb. The average useful life is 70 years.

The following observations are made from the raw data:

- Of the 28 councils that responded, 16 councils reported a useful life of 70 years (Central, Metro and Hills Councils).
- 1 council reported a useful life greater than 80 years (100 years, Metro).
- The majority of councils reported a useful life within the range of 60-80 years.
- 3 councils reported a useful life less than 60 years and these were Metro councils.

Responses:

Of the 31 councils, 28 responded to using concrete median kerbs.

Residuals:

- 1 response had a residual of between 40-45%
- 1 response had a residual of between 20-30%
- 2 responses had a residual of less than 20%

- 27 responses had no residual
- All councils had a response.

Service levels:

With respect to service levels, the following is reported for the 11 out of 28 reported service levels.

Service Standard – the majority of councils reported an acceptable service level. 1 council reported a high service level.

Service Management - the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.5.3 Valley Drain

The results for concrete valley drains are presented in Table 4.21 below.

Table 4-21 Urban Concrete Kerbs – Valley Drain

Concrete Kerb Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Valley Drain	55	100	72	26	1	8	0	4	5	0

There is a 45 year difference between the minimum and maximum useful life values for a valley drain. The average useful life is 72 years.

The following observations are made from the raw data:

- Of the 26 councils that responded, 16 councils reported a useful life of 70 years (Central, Metro, Murray, Hill, Spencer Gulf councils).
- 1 large metro council reported a useful life of below 60 years.
- 2 councils reported a useful life greater than 80 years (100 years, Metro).
- The majority of councils reported a useful life within the range of 60-80 years.

Responses:

Of the 31 councils, 26 responded to using concrete valley drains.

Residuals:

- 1 response had a residual of between 40-45%
- 1 response had a residual of between 20-30%
- 2 responses had a residual of less than 20%
- 27 responses had no residual
- All councils had a response.

Service levels:

With respect to service levels, the following is reported for the 9 out of 26 reported service levels.

Service standard - the majority of councils reported an acceptable service level. 1 council reported a high service level.

Service management - the responses were split between optimum and “too late” service management. No councils responded as having “too early” service management.

4.6 Stormwater

A summary of the responses received for stormwater systems is provided below.

4.6.1 Reinforced Concrete Pipe (RCP)

The results for reinforced concrete pipe material are presented in Table 4.22 below.

Table 4-22 Stormwater - RCP

Stormwater Material/ Structure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
RCP	60	150	98	26	1	8	1	3	5	0

There is a 90 year difference between the minimum and maximum useful life values for reinforced concrete pipe within a stormwater system. The average useful life is 98 years.

The following observations are made from the raw data:

- Of the 26 councils that responded, all but 4 of these councils reported a useful life of 100 years.
- Of the 4 councils that did not report a useful life of 100 years, 3 Central councils reported useful lives less than 100 years (60-70 years) and 1 small metro council reported a useful life greater than 100 years (150 years).

Responses:

Of the 31 councils, 26 responded to using RCP within their stormwater systems.

Residuals:

No residuals were reported by councils for reinforced concrete pipe.

Service levels:

With respect to service levels, the following is reported for 10 out of 26 reported service levels.

Service standard – the majority of councils reported an acceptable service level. 1 council reported a high service level and 1 council reported a low service level.

Service management – the responses were split between optimum and “too late” service management. No councils responded as having “too early” service management.

4.6.2 Stormwater – FRC Pipe

The results for Fibre reinforced concrete pipe material are presented in Table 4.23 below.

Table 4-23 Stormwater – FRC Pipe

Stormwater Material/ Structure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
FRC Pipe	80	100	97	7	1	6	0	3	4	0

There is a 20 year difference between the minimum and maximum useful life values for a FRC material pipe. The average useful life is 97 years.

The following observations are made from the raw data:

- Of the 7 councils that responded, 6 of these reported a useful life of 100 years (Central and large metro council's).
- 1 Central council reported a useful life of 80 years.

Responses:

Of the 31 councils, 7 responded to using FRC pipe in their stormwater system.

Residuals:

No residuals were reported by councils for the FRC pipe.

Service levels:

With respect to service levels, the following is reported for the 7 out of 7 councils that reported service levels.

Service standard – the majority of councils reported an acceptable service level. 1 council reported a high service level.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.6.3 Stormwater – uPVC Pipe

The results for uPVC pipe material are presented in Table 4.24 below.

Table 4-24 Stormwater – uPVC Pipe

Stormwater Material/ Structure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
uPVC Pipe	60	100	84	22	1	8	0	4	5	0

There is a 40 year difference between the minimum and maximum useful life values for a uPVC material stormwater pipe. The average useful life is 84 years.

The following observations are made from the raw data:

- 8 of the 22 councils reported the maximum useful life of 100 years.
- The Central councils and large metro council's reported useful life values in the range of 60-100 years. The Eyre Peninsula and small metro council's reported a range of useful life values of 70-100 years, and the small metro council's reported a range between 80-100 years.
- The minimum useful life of 60 years was reported by a Central council.

Responses:

Of the 31 councils, 22 responded to using uPVC pipe in their stormwater system.

Residuals:

No residuals were reported by councils for the uPVC pipe.

Service levels:

With respect to service levels, the following is reported for the 9 out of 22 councils that reported service levels.

Service standard – the majority of councils reported an acceptable service level. 1 council reported a high service level.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.6.4 Stormwater – Box Culvert

The results for a box culvert are presented in Table 4.25 below.

Table 4-25 Stormwater – Box Culvert

Stormwater Material/ Structure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Box Culvert	60	100	79	27	1	9	1	4	7	0

There is a 40 year difference between the minimum and maximum useful life values for a box culvert within a stormwater system. The average useful life is 79 years.

The following observations are made from the raw data:

- The majority of councils reported a useful life in the range of 70-100 years.
- 2 councils reported a minimum useful life of 60 years (large metro and south east councils).
- The Murray councils all reported a useful life of 70 years, Eyre Peninsula councils reported in the range of 70-80 years, the Central and small metro council's reported in the range of 70-100 years.
- 3 council regions reported the maximum useful life of 100 years (Central councils, large and small metro council's).

Responses:

Of the 31 councils, 27 responded to using a box culvert in their stormwater system.

Residuals:

No residuals were reported by councils for the box culverts.

Service levels:

With respect to service levels, the following is reported for 11 out of 27 councils that reported service levels.

Service standard – the majority of councils reported an acceptable service level. 1 council reported a high service level and 1 council reported a low service level.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.6.5 Stormwater – SEP

The results for a SEP are presented in Table 4.26 below.

Table 4-26 Stormwater - SEP

Stormwater Material/ Structure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
SEP	50	100	72	23	1	10	0	4	7	0

There is a 50 year difference between the minimum and maximum useful life values for a stormwater SEP. The average useful life is 72 years.

The following observations are made from the raw data:

- Of the 23 councils that responded, 10 councils reported a useful life of 80 years (large and small metro, Murray, and Southern Hills).
- 2 councils reported a useful life of greater than 80 years, with the maximum useful life reported of 100 years.
- 5 councils reported the minimum useful life of 50 years (Central, Eyre Peninsula, Southern Hills and Spencer Gulf).

All Murray region councils reported a consistent useful life of 80 years, the large metro council's reported a range between 70-100 years, the Central councils reported a range between 50-75 years, the small metro council's reported a range between 70-80 years, and the Southern hills councils reported a range from 50-80 years.

Responses:

Of the 31 councils, 23 responded to using a SEP in their stormwater system.

Residuals:

No residuals were reported by councils for the SEP's.

Service levels:

With respect to service levels, the following is reported for 11 out of 23 councils that reported service levels.

Service standard – the majority of councils reported an acceptable service level. 1 council reported a high service level.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.6.6 Stormwater – Junction Box

The results for a junction box are presented in Table 4.27 below.

Table 4-27 Stormwater – Junction Box

Stormwater Material/ Structure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Junction Box	50	100	75	21	1	9	0	2	8	0

There is a 50 year difference between the minimum and maximum useful life values for a stormwater junction box. The average useful life is 75 years.

The following observations are made from the raw data:

- Of the 21 councils that responded, 9 councils reported a useful life of 80 years (large and small metro, Murray and Southern Hills).
- 3 councils reported a maximum useful life of 100 years (2 Central and 1 large metro council).
- 4 councils reported a minimum useful life of 50 years (Central, large metro, Southern Hills and Spencer Gulf council).

The Murray councils all reported a useful life of 80 years, the Central and large metro council's reported in the range of 50-100 years, all but one small metro council reported a useful life of 80 years and the Southern Hills councils reported in the range of 50-80 years.

Responses:

Of the 31 councils, 21 responded to using a stormwater junction box in their stormwater system.

Residuals:

No residuals were reported by councils for the junction boxes.

Service levels:

With respect to service levels, the following is reported for 10 out of 21 councils that reported service levels.

Service standard – the majority of councils reported an acceptable service level. 1 council reported a high service level.

Service management – the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.6.7 Stormwater – Headwall

The results for a headwall are presented in Table 4.28 below.

Table 4-28 Stormwater - Headwall

Stormwater Material/ Structure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Headwall	50	100	69	23	1	8	0	3	6	0

There is a 50 year difference between the minimum and maximum useful life values for a stormwater headwall. The average useful life is 69 years.

The following observations are made from the raw data:

- The majority of useful lives reported are within the range of 50-80 years.
- 2 large metro council's reported maximum useful lives of 100 years.
- The Central councils reported useful lives in the range between 50-75 years, the Murray councils reported useful lives of 70 years, small metro and southern hills councils reported useful lives in the range between 70-80 years.
- 5 councils reported a minimum useful life of 50 years (Central and large metro).

Responses:

Of the 31 councils, 23 responded to using a stormwater headwall in their stormwater system.

Residuals:

No residuals were reported by councils for the headwalls.

Service levels:

With respect to service levels, the following is reported for 9 out of 23 councils that reported service levels.

Service standard: the majority of councils reported an acceptable service level. 1 council reported a high service level.

Service management: the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.6.8 Stormwater – Lined Open Channel

The results for a lined open channel are presented in Table 4.29 below.

Table 4-29 Stormwater – Lined Open Channel

Stormwater Material/ Structure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Lined Open Channel	40	100	78	12	0	6	1	2	5	0

There is a 60 year difference between the minimum and maximum useful life values for a lined open channel. The average useful life is 78 years.

The following observations are made from the raw data:

- 5 councils reported the maximum useful life of 100 years (large and small metro, Southern Hills).
- The small metro council's reported useful lives in the range between 70-100 years, the large metro council's reported useful lives in the range between 50-100 years and the Southern Hills councils reported a 70 year and a 100 year useful life.
- One Central council responded and reported the minimum useful life of 40 years.

Responses:

Of the 31 councils, 12 responded to having a lined open channel within their stormwater system.

Residuals:

No residuals were reported by councils for the lined open channels.

Service levels:

With respect to service levels, the following is reported for 7 out of 12 councils that reported service levels.

Service standard: the majority of councils reported an acceptable service level. 1 council reported a low service level.

Service management: the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.7 Floodways

A summary of the response received for floodways is provided below.

4.7.1 Floodways – Concrete Surface

The results for a concrete surface floodway are presented in Table 4.30 below.

Table 4-30 Floodways – Concrete Surface

Floodway Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Surface - Concrete	50	60	52	6	0	1	0	0	1	0

There is a 10 year difference between the minimum and maximum useful life values for a concrete surface floodway. The average useful life is 52 years.

The following observations are made from the raw data:

- 5 of the 6 councils that responded to having a concrete surface floodway reported a useful life of 50 years (Central councils and Southern Hills).
- 1 Eyre Peninsula council reported the maximum life of 60 years.

Responses:

Of the 31 councils, 6 responded to having a concrete surface floodway as part of their stormwater system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels, the following is reported for 1 out of 6 councils that reported service levels.

Service standard: the one council that responded reported an acceptable service standard level.

Service management: the one council that responded reported a "too late" service management.

4.7.2 Floodways – Bitumen Surface

The results for a bitumen surface floodway are presented in Table 4.31 below.

Table 4-31 Floodways – Bitumen Surface

Floodway Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Surface - Bitumen	20	22.5	21	2	0	0	0	0	0	0

There is a 2.5 year difference between the minimum and maximum useful life values for a bitumen surface floodway. The average useful life is 21 years.

The following observations are made from the raw data:

- Both councils that responded were from the Central region and there was only a 2.5 year difference between the useful lives given.

Responses:

Of the 31 councils, 2 responded to having a bitumen surface floodway as part of their stormwater system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels, of the 2 councils that responded to having a bitumen surface floodway, neither reported service levels.

4.7.3 Floodways – Inlet/Outlet Concrete

The results for a concrete inlet/outlet of a floodway are presented in Table 4.32 below.

Table 4-32 Floodways – Inlet/Outlet Concrete

Floodway Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Inlet/ Outlet - Concrete	50	70	55	4	0	1	0	1	0	0

There is a 20 year difference between the minimum and maximum useful life values for an inlet/ outlet concrete floodway. The average useful life is 55 years.

The following observations are made from the raw data:

- Of the 4 councils that responded, 3 of these are from the Central region and these councils reported a useful life of 50 years.
- 1 Southern Hills council reported the maximum life of 70 years.

Responses:

Of the 31 councils, 4 responded to having an inlet/outlet concrete floodway as part of their stormwater system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels, the following is reported for 1 out of 4 councils that reported service levels.

Service standard: the one council that responded reported an acceptable service standard level.

Service management: the one council that responded reported an optimum service management level.

4.7.4 Floodways – Inlet/Outlet Rock/ Rip-rap

The results for a rip-rap inlet/outlet of a floodway are presented in Table 4.33 below.

Table 4-33 Floodways – Inlet/Outlet Rock/ Rip-rap

Floodway Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Inlet/ Outlet – Rock/ Rip-rap	50	50	50	2	0	1	0	1	0	0

The minimum, maximum and average useful life values for an inlet/outlet rock/ rip-rap floodway are 50 years.

The following observations are made from the raw data:

- The 2 councils that responded were both from the Central region and reported the same useful life values.

Responses:

Of the 31 councils, 2 responded to having an inlet/outlet rock/ rip-rap floodway as part of their stormwater system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels, the following is reported for 1 out of 2 councils that reported service levels.

Service standard: the one council that responded reported an acceptable service standard level.

Service management: the one council that responded reported an optimum service management level.

4.8 Community Wastewater Management System (CWMS)

A summary of the responses received for Community Wastewater Management Systems is provided below.

4.8.1 CWMS Infrastructure – Earthenware Gravity Pipe

The results for an earthenware gravity pipe are presented in Table 4.34 below.

Table 4-34 CWMS Infrastructure - Earthenware Gravity Pipe

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Earthenware Gravity Pipe	60	100	76	5	0	2	0	0	2	0

There is a 40 year difference between the minimum and maximum useful life values for earthenware gravity pipe. The average useful life is 76 years.

The following observations are made from the raw data:

- 2 Murray councils reported useful lives of 70 and 80 years, 2 Central councils reported useful lives of 60 and 100 years, and 1 Southern Hills council reported a useful life of 70 years.

Responses:

Of the 31 councils, 5 responded to having an earthenware gravity pipe as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels, the following is reported for 2 out of 5 councils that reported service levels.

Service standard: both councils that responded reported an acceptable service standard level.

Service management: both councils that responded reported a "too late" service management level.

4.8.2 CWMS Infrastructure – PVC Gravity Pipe

The results for an PVC gravity pipe are presented in Table 4.35 below.

Table 4-35 CWMS Infrastructure - PVC Gravity Pipe

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
PVC Gravity Pipe	60	100	77	12	0	5	0	2	3	0

There is a 40 year difference between the minimum and maximum useful life values for a PVC gravity pipe. The average useful life is 77 years.

The following observations are made from the raw data:

- The maximum useful life of 100 years was reported by 3 councils (Central region, Eyre Peninsula, and Spencer Gulf). A minimum useful life was reported by 3 councils (2 Central and 1 South East).
- 3 Southern Hills and 3 Murray councils reported useful lives between 70-80 years respectively. The Central region councils reported useful lives between 60-100 years.

Responses:

Of the 31 councils, 12 responded to having a PVC gravity pipe as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 5 out of 12 that reported service levels.

Service standard: All councils that responded reported an acceptable service standard level.

Service management: the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.8.3 CWMS Infrastructure – PVC Rising Main Pipe

The results for an PVC Rising Main gravity pipe are presented in Table 4.36 below.

Table 4-36 CWMS Infrastructure - PVC Rising Main Pipe

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
PVC Rising Main Pipe	50	80	61	12	0	5	0	2	3	0

There is a 30 year difference between the minimum and maximum useful life values for a PVC rising main pipe. The average useful life is 61 years.

The following observations are made from the raw data:

- The Murray councils reported a useful life of 50 years, the southern hills councils reported useful lives in the range between 50-80 years, and the Central councils reported useful lives in the range between 50-60 years.
- The maximum useful life of 80 years was reported by a Spencer Gulf and a Southern Hills council. The south east council reported a useful life of 60 years and 1 Eyre Peninsula council that responded reported a useful life of 70 years.

Responses:

Of the 31 councils, 12 responded to having PVC rising main pipe as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 5 out of 12 that reported service levels.

Service standard: All councils that responded reported an acceptable service standard level.

Service management: the responses were split between optimum and “too late” service management. No councils responded as having “too early” service management.

4.8.4 CWMS Infrastructure – Pump Chamber

The results for a pump chamber are presented in Table 4.37 below.

Table 4-37 CWMS Infrastructure - Pump Chamber

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Pump Chamber	20	58	39	13	0	4	1	2	3	0

There is a 38 year difference between the minimum and maximum useful life values of a pump chamber. The average useful life is 39 years.

The following observations are made from the raw data:

- The Central councils reported useful lives in the range between 20-50 years, the Murray councils reported useful lives in the range between 30-58 years, and the Southern Hills councils reported useful lives in the range between 30-50 years.
- 1 large metro council reported a useful life of 25 years, and 1 Eyre Peninsula council reported a useful life of 30 years. The south east council and 1 Spencer Gulf council both reported a useful life of 50 years.

Responses:

Of the 31 councils, 13 responded to having a pump chamber as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 5 out of 13 that reported service levels.

Service standard: The majority of councils that responded reported an acceptable service standard level. 1 council reported a low service level.

Service management: the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.8.5 CWMS Infrastructure – Pump

The results for a pump are presented in Table 4.38 below.

Table 4-38 CWMS Infrastructure - Pump

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Pump	10	25	16	13	0	4	1	2	3	0

There is a 15 year difference between the minimum and maximum useful life values of a pump. The average useful life is 16 years.

The following observations are made from the raw data:

- The Central councils reported useful lives in the range between 10-20 years, the Murray councils reported useful lives in the range between 15-17.5 years and the Southern Hills councils reported useful lives in the range between 13.5-20 years.
- 1 large metro council responded with the maximum useful life of 25 years. 1 council in the Central region reported the minimum useful life of 10 years.

Responses:

Of the 31 councils, 13 responded to having a pump as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 5 out of 13 that reported service levels.

Service standard: The majority of councils that responded reported an acceptable service standard level. 1 council reported a low service level.

Service management: the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.8.6 CWMS Infrastructure – Pump Mechanical and Electrical

The results for pump mechanical and electrical components are presented in Table 4.39 below.

Table 4-39 CWMS Infrastructure - Pump Mechanical and Electrical Services

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Pump Mech. and Elec.	10	30	18	13	0	4	1	2	3	0

There is a 20 year difference between the minimum and maximum useful life values of the mechanical and electrical services for the CWMS. The average useful life is 18 years.

The following observations are made from the raw data:

- The Central councils reported useful lives in the range between 20-30 years, the Murray councils reported useful lives in the range between 10-15 years, and the Southern Hills councils reported useful lives in the range between 10-25 years.
- 1 Central council reported the maximum useful life of 30 years. 1 Murray council and 1 Southern Hills council reported the minimum useful life of 10 years.
- 1 Eyre Peninsula council, 1 south east council and 1 Spencer Gulf council reported a useful life of 15 years.

Responses:

Of the 31 councils, 13 responded to having mechanical and electrical services as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 5 out of 13 that reported service levels.

Service standard: The majority of councils that responded reported an acceptable service standard level. 1 council reported a low service level.

Service management: the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.8.7 CWMS Infrastructure – Flushing Point

The results for a flushing point are presented in Table 4.40 below.

Table 4-40 CWMS Infrastructure – Flushing Point

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg		1	2	3	1	2	3
Flushing Point	50	100	71	11	0	4	0	2	2	0

There is a 50 year difference between the minimum and maximum useful life values for a flushing point. The average useful life is 71 years.

The following observations are made from the raw data:

- 1 large metro council that responded reported the minimum useful life of 50 years. 1 Spencer Gulf council that responded reported the maximum useful life of 100 years.
- The Central region councils that responded reported useful lives in the range between 60-70 years, the Murray councils and the Southern Hills councils reported useful lives in the range between 70-80 years.

Responses:

Of the 31 councils, 11 responded to having a flushing point as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 4 out of 11 that reported service levels.

Service standard: All councils that responded reported an acceptable service standard level.

Service management: the responses were split between optimum and “too late” service management. No councils responded as having “too early” service management.

4.8.8 CWMS Infrastructure – Access Chamber

The results for an access chamber are presented in Table 4.41 below.

Table 4-41 CWMS Infrastructure - Access Chamber

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Access Chamber	50	70	62.5	4	0	3	0	2	1	0

There is a 20 year difference between the minimum and maximum useful life values for an access chamber. The average useful life is 62.5 years.

The following observations are made from the raw data:

- 1 Southern Hills council reported the minimum useful life of 50 years. 1 Murray council and 1 Central region council reported the maximum useful life of 70 years.
- 2 Central region councils responded, 1 with a useful life of 60 years and 1 with a useful life of 70 years.

Responses:

Of the 31 councils, 4 responded to having an access chamber as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 3 out of 4 that reported service levels.

Service standard: All councils that responded reported an acceptable service standard level.

Service management: the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.8.9 CWMS Infrastructure – Maintenance Hole

The results for a pump are presented in Table 4.42 below.

Table 4-42 CWMS Infrastructure - Maintenance Hole

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Maintenance Hole	50	100	72	10	0	3	0	2	1	0

There is a 50 year difference between the minimum and maximum useful life values for a maintenance hole. The average useful life is 72 years.

The following observations are made from the raw data:

- 1 large metro council that responded reported the minimum useful life of 50 years. 1 Spencer Gulf council that responded reported the maximum useful life of 100 years.
- 2 Central councils reported useful lives of 60 and 70 years, the Murray and Southern Hills councils reported useful lives in the range between 70-80 years.

Responses:

Of the 31 councils, 10 responded to having a maintenance hole as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 3 out of 10 that reported service levels.

Service standard: All councils that responded reported an acceptable service standard level.

Service management: the responses were split between optimum and "too late" service management. No councils responded as having "too early" service management.

4.8.10 CWMS Infrastructure – Inspection Point

The results for a pump are presented in Table 4.43 below.

Table 4-43 CWMS Infrastructure - Inspection Point

CWMS Infrastructure Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Inspection Point	50	100	71	8	0	2	0	1	1	0

There is a 50 year difference between the minimum and maximum useful life values for an inspection point. The average useful life is 71 years.

The following observations are made from the raw data:

- 1 large metro council that responded reported the minimum useful life of 50 years. 1 Spencer Gulf council that responded reported the maximum useful life of 100 years.
- 2 Central councils reported useful lives of 60 and 70 years, the Murray councils reported useful lives in the range of 70-80 years and 1 Southern Hills council responded to report a useful life of 70 years.

Responses:

Of the 31 councils, 8 responded to having an inspection point as part of their CWMS system.

Residuals:

Councils provided either a residual of zero or did not respond.

Service levels:

With respect to service levels the following is reported for 2 out of 8 councils that reported service levels.

Service standard: All councils that responded reported an acceptable service standard level.

Service management: the responses were split between optimum and "too late" service management.

4.9 Bridges

A summary of the responses received for bridge infrastructure is provided below.

4.9.1 Bridges – Timber Deck

The results for a timber deck bridge are presented in Table 4.44 below.

Table 4-44 Bridges – Timber Deck

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Timber Deck	30	80	57	7	0	3	2	3	2	0

There is a 50 year difference between the minimum and maximum useful life values for a timber deck bridge. The average useful life is 57 years.

The following observations are made from the raw data:

- 5 out of the 6 large metro council's responded, and they reported useful lives in the range of 30-80 years. 2 Southern Hills councils reported a useful life of 80 years.

Responses:

Of the 31 councils, 7 responded to having a timber deck bridge.

Service levels:

With respect to service levels the following is reported for 5 out of 7 councils that reported service levels.

Service standard: the responses were split between an acceptable service standard and a low service standard.

Service management: the responses were split between optimum and "too late" service management.

4.9.2 Bridges – Concrete Deck

The results for a concrete deck bridge are presented in Table 4.45 below.

Table 4-45 Bridges – Concrete Deck

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Concrete Deck	60	100	86	12	1	6	1	5	3	0

There is a 40 year difference between the minimum and maximum useful life values for a concrete deck bridge. The average useful life is 86 years.

The following observations are made from the raw data:

- 2 Southern Hills councils responded with the same useful life value (80 years) as did the 2 councils that reported from small metro (100 years).

- 4 different area councils reported the maximum useful life of 100 years (small metro, large metro, Eyre Peninsula and Central region councils).
- 5 out of the 6 large metro council's responded, and they reported useful lives in the range of 77-100 years.

Responses:

Of the 31 councils, 12 responded to having a concrete deck bridge.

Service levels:

With respect to service levels the following is reported for 8 out of 12 councils that reported service levels.

Service standard: the majority of responses were an acceptable service standard. 1 council responded with a high service level and 1 with a low service standard.

Service management: the responses were split between optimum and "too late" service management.

4.9.3 Bridges – Culvert Deck

The results for a culvert deck bridge are presented in Table 4.46 below.

Table 4-46 Bridges – Culvert Deck

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Culvert Deck	47	100	78	10	0	4	1	4	1	0

There is a 53 year difference between the minimum and maximum useful life values for a culvert deck bridge. The average useful life is 78 years.

The following observations are made from the raw data:

- The majority of councils reported a useful life of 80 years (large metro, small metro, southern hills).
- All but one large metro council reported a useful life of 80 years (47 years). 1 Eyre Peninsula council responded with the maximum useful life of 100 years.

Responses:

Of the 31 councils, 10 responded to having a culvert deck bridge.

Service levels:

With respect to service levels the following is reported for 5 out of 10 councils that reported service levels.

Service standard: the majority of responses were an acceptable service standard. 1 council responded with a low service standard.

Service management: the majority of responses were optimum service management. 1 council reported "too late" service management.

4.9.4 Bridges – Abutment Stone

The results for an abutment stone bridge are presented in Table 4.47 below.

Table 4-47 Bridges – Abutment Stone

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Abutment Stone	80	80	80	1	0	0	0	0	0	0

1 council responded to having an abutment stone bridge. This council was a Southern Hill council and they reported a useful life of 80 years.

This council did not report on service levels.

4.9.5 Bridges – Abutment Concrete

The results for an abutment concrete bridge are presented in Table 4.48 below.

Table 4-48 Bridges – Abutment Concrete

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Abutment Concrete	70	100	85	6	0	2	0	1	1	0

There is a 30 year difference between the minimum and maximum useful life values for an abutment concrete bridge. The average useful life is 85 years.

The following observations are made from the raw data:

- The 2 southern hills councils that responded reported a useful life of 80 years. The maximum useful life value of 100 years was reported a Central region council and an Eyre Peninsula council. 2 large metro council's reported useful lives of 70 and 80 years.

Responses:

Of the 31 councils, 6 responded to having an abutment concrete bridge.

Service levels:

With respect to service levels the following is reported for 2 out of 6 councils that reported service levels.

Service standard: both responses were an acceptable service standard.

Service management: 1 response was optimum service level management and 1 response was "too late" service management.

4.9.6 Bridges – Steel Beams

The results for a steel beam bridge are presented in Table 4.49 below.

Table 4-49 Bridges – Steel beams

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Steel Beams	80	100	87	6	0	2	1	1	2	0

There is a 20 year difference between the minimum and maximum useful life values for a steel beam bridge. The average useful life is 87 years.

The following observations are made from the raw data:

- Of the 6 councils that responded, 2 councils reported the maximum useful life of 100 years (Central region and Eyre Peninsula). The other 4 councils reported a useful life of 80 years (large metro and southern hills).

Responses:

Of the 31 councils, 6 responded to having a steel beam bridge.

Service levels:

With respect to service levels the following is reported for 3 out of 6 councils that reported service levels.

Service standard: the majority of responses were an acceptable service standard. 1 council responded with a low service standard.

Service management: the majority of responses were “too late” service management level. 1 council reported optimum service management.

4.9.7 Bridges – Timber Beams

The results for a timber beam bridge are presented in Table 4.50 below.

Table 4-50 Bridges – Timber Beams

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Timber Beams	35	80	59	4	0	1	1	1	1	0

There is a 45 year difference between the minimum and maximum useful life values for a timber beam bridge. The average useful life is 59 years.

The following observations are made from the raw data:

- 2 Southern Hills councils reported a useful life of 80 years. 2 large metro council’s reported useful lives of 35 and 41 years.

Responses:

Of the 31 councils, 4 responded to having a timber beam bridge.

Service levels:

With respect to service levels the following is reported for 2 out of 4 councils that reported service levels.

Service standard: 1 council reported an acceptable service level and 1 reported a low service level.

Service management: 1 council reported optimum service management and 1 council reported "too late" service management.

4.9.8 Bridges – Concrete Beams

The results for a concrete beam bridge are presented in Table 4.51 below.

Table 4-51 Bridges – Concrete Beams

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Concrete Beams	77	100	83	5	0	2	1	1	2	0

There is a 23 year difference between the minimum and maximum useful life values for a concrete beam bridge. The average useful life is 83 years.

The following observations are made from the raw data:

- Of the 5 councils that responded, 3 councils reported a useful life of 80 years (large metro and southern hills). 1 Central council reported the maximum useful life of 100 years.

Responses:

Of the 31 councils, 5 responded to having a concrete beam bridge.

Service levels:

With respect to service levels the following is reported for 3 out of 5 councils that reported service levels.

Service standard: 2 councils reported an acceptable service level and 1 reported a low service level.

Service management: 1 council reported optimum service management and 2 councils reported "too late" service management.

4.9.9 Bridges – W Beam Bridge Barrier and Handrail

The results for a W beam bridge barrier and handrail are presented in Table 4.52 below.

Table 4-52 Bridges – W Beam Bridge Barrier and Handrail

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
W beam bridge barrier and handrail	50	80	70	3	1	0	1	1	1	0

Of the 31 councils, 3 responded to having a W beam bridge barrier and handrail. There is a 30 year difference between the minimum and maximum useful life values and the average useful life is 70 years.

2 Southern Hills councils reported a useful life of 80 years and 1 large metro council reported a useful life of 50 years.

Service levels:

With respect to service levels the following is reported for 2 out of 3 councils that reported service levels.

Service standard: 1 council reported a high service level and 1 council reported a low service level.

Service management: 1 council reported optimum service management and 1 council reported "too late" service management.

4.9.10 Bridges – Timber Barrier

The results for a timber bridge barrier are presented in Table 4.53 below.

Table 4-53 Bridges – Timber Barrier

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Timber Barrier	35	80	57.5	2	0	1	1	1	1	0

Of the 31 councils, 2 responded to having a timber bridge barrier. There is a 45 year difference between the minimum and maximum useful life values and the average useful life is 57.5 years.

1 large metro council reported a useful life of 35 years and 1 Southern Hills council reported a useful life of 80 years.

Both councils reported on service levels.

Service standard: 1 council reported an acceptable service standard and 1 council reported a low service standard.

Service management: 1 council reported optimum service management and 1 council reported "too late" service management.

4.9.11 Bridges – Concrete Barrier

The results for a concrete bridge barrier/ handrail are presented in Table 4.54 below.

Table 4-54 Bridges – Concrete Barrier

Bridge Component Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
Concrete Barrier/ handrail	80	80	80	2	0	1	1	1	1	0

Of the 31 councils, 2 responded to having a concrete bridge barrier. Both councils reported a useful life of 80 years (large metro and Southern Hills).

Both councils reported on service levels.

Service standard: 1 council reported an acceptable service standard and 1 council reported a low service standard.

Service management: 1 council reported optimum service management and 1 council reported "too late" service management.

4.10 Jetties/Boardwalks

A summary of the responses received for jetties/ boardwalks is provided below.

4.10.1 Jetty - Timber Deck

Of the 31 councils, 4 responded to having a jetty with a timber deck. 3 councils reported a useful life of 30 years (Central, large metro, small metro). 1 Central region council reported the maximum useful life of 60 years.

3 of the 4 councils reported on service levels.

Service standard: 2 councils reported an acceptable service standard and 1 council reported a low service standard.

Service management: All councils reported "too late" service management.

4.10.2 Jetty - Concrete Deck

Of the 31 councils, 1 responded to having a jetty with a concrete deck. The small metro council reported a useful life of 40 years.

The council did not report on service levels.

4.10.3 Jetty - Concrete Abutment

Of the 31 councils, 1 responded to having a concrete jetty abutment. The small metro council reported a useful life of 50 years.

The council did not report on service levels.

4.10.4 Jetty - Timber Beams

Of the 31 councils, 1 responded to having timber jetty beams. The Central region council reported a useful life of 30 years.

The council reported an acceptable service standard and an optimum service management standard.

4.10.5 Jetty - Timber Barrier/ Handrail

Of the 31 councils, 1 responded to having a timber barrier/ handrail on a jetty. The Central region council reported a useful life of 30 years.

The council reported an acceptable service standard and an optimum service management standard.

4.11 Buildings

The survey was very general in nature. By way of summary the following is a reflection of the survey. Of the 31 Councils involved only 3-10 responded, depending on the component being reported. A summary of the responses received for buildings is provided in Table 4.55 below.

Table 4-55 Summary of Responses

	Life		Residual %		Service Level %		Service Level Manage %	
	No. Of councils	Life (years)	No. Of councils	%	No. Of councils	%	No. Of councils	%
Building Structure	1 8 1 21	100 60-80 40 -	2 1 5 2 21	60-65 40 15-25 0 -	10 21	2 -	5 5 21	2 1 -
Building Roof	6 2 1 22	40 30 20 -	2 3 4 22	40-50 20-30 0-10 -	1 8 22	3 2 -	5 4 22	2 1 -
Building Fitout	3 5 23	20 10-15 -	2 4 2 23	15 5 0 -	8 23	2 -	4 4 23	2 1 -
Building Services	4 1 26	50 40 -	2 1 2 26	35 25 10 -	5 26	2 -	3 2 26	2 1 -
Building Plumbing	1 2 28	50 40 -	1 1 1 28	70 15 0 -	3 28	2 -	1 2 28	2 1 -
Building Air Conditioning	3 1 27	20 15 -	1 3 27	10 0 -	1 3 27	3 2 -	4 27	2 -

4.11.1 Building - Structures

Of the 8 responses, the life of 60-80 years was the majority, in all cases residuals were reported in the range for 0-65%.

4.11.2 Building - Roof

Of the 9 responses, the life of 30-40 years was the majority, in all cases residuals were reported in the range for 0-50%.

4.11.3 Building – Fit out

Of the 8 responses, the life of 10-20 years was the majority. Residuals range from 0 to 15%.

4.11.4 Building – Services

Of the 5 responses, 40-50 years was the majority and residuals range from 10-35%.

4.11.5 Building – Plumbing

Of the 3 responses, 40-50 years was the majority and residuals range from 0-70%.

4.11.6 Building – Air conditioning

Of the 4 responses, 15-20 years was the majority and residuals range from 0-10%.

4.12 Summary Tables

Summary tables of useful lives, number or responses and service level ratings are presented below.

Table 4-56: Summary of Road and Pavement Types

Road or Pavement Type	Useful Life (Years) - Normal Use			Useful Life (Years) - Heavy Use			No. of Responses		Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg	Min	Max	Avg	Normal Use	Heavy Use	1	2	3	1	2	3
Urban Spray Seal	15	33	22	12	28.5	21	29	19	1	10	0	5	6	0
Urban Cold Overlay	7	25	17	10	22.5	17	15	10	1	7	0	3	5	0
Urban Hotmix	15	35	26	15	40	24	24	18	2	8	0	4	6	0
Urban Unsealed - Sheeted	10	30	18	-	-	-	24	-	0	5	2	3	4	0
Rural Spray Seal	15	30	21	15	25	19	21	16	0	7	0	4	3	0
Rural Cold Overlay	16	25	20	16	25	20	4	4	0	3	0	1	2	0
Rural Hotmix	17	30	24	17	25	22	12	8	1	5	0	3	3	0
Rural Sheeted Arterial	6	20	12	8	24.5	14	11	17	2	4	0	3	3	0
Rural Sheeted Collector	10	26	16	10	31.5	19	12	18	0	6	0	4	2	0
Rural Sheeted Local	8	32	20	12	40	24	14	19	0	4	3	3	3	1
Rural Sheeted Track	20	40	27	20	50	31	8	11	0	4	1	2	3	1
Urban Granular Pavement	55	150	83	45	100	67	31	26	2	8	0	4	6	0
Rural Granular Pavement	20	85	68	20	90	52	18	16	1	3	1	2	3	0

Table 4-57: Summary Table of Other Assets

Asset Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating - Management		
	Min	Max	Avg		1	2	3	1	2	3
Paved Footpath	30	60	46	30	0	12	0	5	7	0
Concrete Footpath	40	80	54	29	0	9	1	2	8	0
Spray Seal Footpath	15	50	23	23	0	7	1	2	6	0
Hotmix Footpath	20	50	28	27	1	10	0	4	7	0
Crusher Dust Footpath	5	40	16	24	0	6	1	2	5	0
Upright Concrete Kerbs	55	100	74	31	0	11	1	4	8	0
Median Concrete Kerbs	40	100	70	28	1	10	0	5	6	0
Valley Drain Concrete Kerbs	55	100	72	26	1	8	0	4	5	0
Stormwater - RCP	60	150	98	26	1	8	1	3	5	0
Stormwater - FRC	80	100	97	7	1	6	0	3	4	0
Stormwater - uPVC	60	100	84	22	1	8	0	4	5	0
Stormwater – Box Culvert	60	100	79	27	1	9	1	4	7	0
Stormwater - SEP	50	100	72	23	1	10	0	4	7	0
Stormwater – Junction Box	50	100	75	21	1	9	0	2	8	0
Stormwater - Headwall	50	100	69	23	1	8	0	3	6	0
Stormwater – Lined Open Channel	40	100	78	12	0	6	1	2	5	0
Floodways – Concrete Surface	50	60	52	6	0	1	0	0	1	0
Floodways – Bitumen Surface	20	22.5	21	2	0	0	0	0	0	0
Floodways – Inlet/Outlet Concrete Structure	50	70	55	4	0	1	0	1	0	0
Floodways – Inlet/Outlet Rock/Riprap	50	50	50	2	0	1	0	1	0	0
CWMS – Earthenware Gravity Pipe	60	100	76	5	0	2	0	0	2	0

Asset Type	Useful Life (Years)			No. of Responses	Service Level Rating - Standard			Service Level Rating -Management		
	Min	Max	Avg		1	2	3	1	2	3
CWMS – PVC Gravity Pipe	60	100	77	12	0	5	0	2	3	0
CWMS – PVC Rising Main Pipe	50	80	61	12	0	5	0	2	3	0
CWMS – Pump Chamber	20	58	39	13	0	4	1	2	3	0
CWMS - Pump	10	25	16	13	0	4	1	2	3	0
CWMS – Pump Mech. and Elec.	10	30	18	13	0	4	1	2	3	0
CWMS – Flushing Point	50	100	71	11	0	4	0	2	2	0
CWMS – Access Chamber	50	70	62.5	4	0	3	0	2	1	0
CWMS – Maintenance Hole	50	100	72	10	0	3	0	2	1	0
CWMS – Inspection Point	50	100	71	8	0	2	0	1	1	0
Bridge – Timber Deck	30	80	57	7	0	3	2	3	2	0
Bridge – Concrete Deck	60	100	86	12	1	6	1	5	3	0
Bridge – Culvert Deck	47	100	78	10	0	4	1	4	1	0
Bridge – Abutment Stone	80	80	80	1	0	0	0	0	0	0
Bridge – Abutment Concrete	70	100	85	6	0	2	0	1	1	0
Bridge – Steel Beams	80	100	87	6	0	2	1	1	2	0
Bridge – Timber Beams	35	80	59	4	0	1	1	1	1	0
Bridge – Concrete Beams	77	100	83	5	0	2	1	1	2	0
Bridge – w/beam bridge barrier and handrail	50	80	70	3	1	0	1	1	1	0
Bridge – Timber Barrier	35	80	57.5	2	0	1	1	1	1	0
Bridge – Concrete Barrier	80	80	80	2	0	1	1	1	1	0

5 Discussion

The following provides an opinion on the results of the survey and on the follow-up feedback received at the IPWEA Useful Life Workshop held on 10 December 2013 at the City of Unley. We have included in the discussion both the feedback from the workshop and commentary on our overall assessment of the reasonableness of the survey results and the workshop conclusions.

5.1 Road Surfaces

Seal Surfaces

The survey demonstrated there is greater consistency in useful life for hotmix than sprayseal.

There can be good reasons for there to be a range of useful lives for seal surfaces (and of course other asset classes too) within and across councils. Useful lives will vary depending for example on the quality of construction and materials used and the operating environment. They can also vary depending on preferred or affordable service levels, e.g. for roads intervention level set to treat roads.

Surfaces need to be a separate component to pavements. However, when lower cost treatments like spray seals are applied to hotmix, further work is needed to decide whether to add the seal as a new component and extend the life of the hotmix and retain in the register. While this is not common practice it is considered a reasonable method.

The alternative to dispose the hotmix and replacement with spray seal is reasonable if the hotmix is physically removed through profiling.

Consideration is needed that hotmix under a spray seal can continue to have value until it is removed, and with the evolution of road asset registers the accounting for this in the future will become more common.

The notion of disposing of the hotmix and replacing with a spray seal when the hotmix remains under the seal is not reasonable as the hotmix exists and has value.

The notion of treating the cost difference between hotmix and spray seal as a residual is not consider reasonable as the hotmix does not last indefinitely.

Consideration is needed as to whether surface rejuvenation treatments are an asset or just a maintenance activity, however if they extend the life of the asphalt then it needs to be considered in determining the useful life of the asphalt and given rejuvenation treatments will be effective for a number of years and may need reapplying in the future to achieve the hotmix life then by definition it should be considered an asset.

A further consideration when there are multiple surfaces is to establish if the combination of surfaces define the surface as a combined asset or whether the top surface is the asset being considered. The reason this is important is that when a spray seal is placed at time of construction, quite often the life of that surface is shorter than the combined surface when further treatments are applied. As an example, a 2-coat seal placed at time of construction may only last 15 years if there is a poor bond to the pavement, however, if a single seal is placed in the future, the combined surfaces may last much longer. This is normally manageable with appropriate componentisation and/or categorisation of surface types.

A further consideration is how to deal with componentising and or categorising double coat and single coat spray seals given they are similar surface types and a single coat is commonly applied over a double coat seal. It is common to treat the gap in cost as a residual. However through componentisation, both treatments can coexist in the asset register over different life ranges. The application of the single coat effectively extends the life of the original double coat surface in a similar way to the effect on hotmix that is discussed above.

Many of these issues and questions will be answered depending on the capability and resources available to the Council to handle these complexities at a component level.

However, it is considered important that if there are innovative and smart solutions to effectively manage the surfaces then it should be reflected in the way the surface asset is valued and set-up in the asset register.

The service levels are linked to a number of factors including; type of surface (hotmix/ spray seal / cold overlay), usage of the road (high/ low) and the intervention standard.

While there may be longer life surfaces due to intervening at a poor surface condition this in turn has the potential to shorten the underlying pavement life. Hence early intervention needs to consider its effect on pavement life as does too late intervention. This needs to be considered in conjunction with end user expectations and impacts of moisture infiltration on pavement and subgrades.

Sheeted Surfaces

The survey results demonstrated there is a geographic spread of results and there is a range of factors influencing useful life, which includes:

- Availability of pit material
- Geographic spread of pits
- Climate
- Budget/ funding
- Workforce skills
- Expectations (service levels)
- Depth of material
- Size of stone, plasticity
- Road usage

At the IPWEA workshop on the 10 December 2013, the following life ranges were developed:

• Rural Arterial (Poor material)	8-12 years
• Rural Arterial (Good material)	10-15 years
• Connector (Poor material)	12-15 years
• Connector (Good material)	20-25 years
• Local (Poor material)	15 years minimum
• Local (Good material)	Aim for 30 years
• Track	40-50 years (Good or Poor material)

It is considered reasonable that useful life outside their ranges is adopted then specific local conditions should be explained and clarified to help justify the adopted useful life.

It is also important that the application of residuals be considered when setting useful life and the above life's are reflective of the typical frequency of resheeting and not the reconstruction of the total formation and sheeting.

A separate consideration is needed on the use of components for wearing surface, lower base and formation. However, if residuals are being applied it needs to be clear on the basis by which these residuals are applied.

When considering the responses for service levels there was a noticeable difference for each category as follows:

- Arterials and Collectors: Generally, high to acceptable standard with optimum to too late service management.
- Local and Track: Generally acceptable to low standard with a mix of optimum/ too late and too early service input.

5.2 Road Pavements

The results of the survey indicate a clear difference between high and low use pavements and the urban and rural pavements.

The IPWEA workshop identified that it is reasonable to categorise based on soil condition, material quality/ type, construction quality and road hierarchy. The workshop also considered the layering of pavements between base and sub-base may have a different life and residual treatment.

The adoption of useful life below 25 years would be considered an outlier and would need careful review to demonstrate such a short life is realistic for local government roads.

Also, the range of 50-100 years is entirely reasonable depending on construction standard, usage, material type and surface renewal frequency.

Useful life above 100 years would need to be justified however in good environments and maintenance regimes it is considered possible.

The use of residual on pavements is widely used and with a variety of percentages. It is unclear on the justifications and assumptions used to justify the residuals, and given the wide range of results it is reasonable to assume there is a lack of consistency in interpretation and would be worth exploring this further.

It is appropriate that if residuals are used that rural roads can be renewed with a granular overlay where town roads are more fixed by kerb levels leading to more excavation and removal and lower residuals.

There are also opportunities to increase use of techniques to re-use existing materials and strengthening with stabilised insitu treatments that will also affect residuals. The cost of disposal of good base material continues to climb and any options to re-use existing material will help justify residual percentages. However, there needs to be a link between work practices and assumptions in the treatment of residuals.

Service standard was high to acceptable generally and service management was optimum to too late.

It has been demonstrated there is a link between surface life and its impact on pavement life and accordingly when considered service levels for roads it is recommended that the life assigned to surface will also impact on the pavement life.

5.3 Kerb

The result of the survey showed a range of 55 years to 100 years. The IPWEA workshop considered 55 years (too low) and 100 year (too high).

- Factors affecting life include:
- Tree density and type
- Grade of road
- Urban renewal
- Type of kerb (precast/ in-situ/ stone)
- Bus routes

The way the unit rate for kerb is developed will influence appropriateness of using residuals.

Considerations can be given to:

- Re-use of stone for stone kerbs
- Is the base under the kerb included in the unit rate and is it re-used?

At the IPWEA workshop it was concluded instead of using residuals it was preferred to develop the unit rate to reflect what it costs to do the work.

With respect to service levels the survey suggests the service standard is acceptable (some low) and service management is optimum to "too late".

At the IPWEA workshop there were technical and community level of service considerations including:

- Technical
- Water ponding
- Kerb height
- Cracking
- Displacement
- Community
- Appearance (old vs. new)
- Material (e.g. stone vs. concrete)
- Patching vs. full replacement

There was considered a strong link between technical and community level of service.

5.4 Footpath

At the IPWEA workshop there was a general feeling after seeing the results of the survey that useful life for pavers could range from 40-60 years and 50 years for concrete.

The survey result suggests 25-30 years is appropriate for hotmix.

However the life can be reduced by:

- Trees
- Streetscape programs (political)
- Service authorities
- Building work damage
- Soil movement
- Quality of materials

The majority of Councils assumed no residual. Like kerbs it is appropriate to develop cost rates based on costs to Councils at end of life. The concept of developing components was no considered appropriate.

Service levels were reported acceptable to high and service management too late to optimum.

Presumably due to the public liability risks associated with maintaining footpaths for public use there is a strong link and consistency in results for useful life and service levels.

5.5 Stormwater

The survey results provide a range of lives; however the following provides a summary of the majority of responses.

- Pipe (RCP) 100 years
- Pipe (FRC) 80 years
- Pipe (uPVC) 60-70 years
- Box culvert (concrete) 60-70 years
- SEP 70-80 years
- Junction box 50-80 years
- Headwall 70-80 years

The IPWEA workshop reviewed the results and there was general consensus.

There is limited reported use of residual and that is appropriate given the pipes will be destroyed when removed. However the technologies associated with relining pipes may result in lower cost renewal in certain circumstances.

It is appropriate to categorise stormwater assets by material type.

For long life assets the service levels would be based on considerations like maintenance, blockages, design requirement related to stormwater flood protection and standard.

5.6 CWMS

The survey results provide a range of lives; however the following provides a summary of the majority of responses.

- Gravity pipe (Earthenware) 60-80 years
- Gravity pipe (PVC) 60-80 years
- Rising main (PVC) 50-60 years
- Pump Chamber 35-45 years
- Pumps 15-20 years
- Pump Station (Mechanical/ Electrical) 10-20 years
- Flushing Points 50-70 years
- Access Chambers 50-70 years
- Maintenance Holes 50-80 years
- Inspection Points 50-70 years

There was no discussion on CWMS at the IPWEA workshop.

The majority reported not using residuals. It is appropriate to categorise CWMS assets by material type.

For CWMS systems, the treatment plants are influenced by technology development and demand changes.

The pipe networks are influenced by blockages, tree roots and joint displacement.

5.7 Buildings

From the IPWEA workshop there was a degree of interest in the building asset group.

The following summarises the findings of the workshop:

- The useful life of building structure will vary for a shed to the Council Chambers. Hence it is not possible to assign a standard life across all buildings. Each building will be unique based on its utilisation and importance. A disused remote hall will be different to a child care centre.
- The use of residuals was considered relevant depending on if / when a Council intervened to renew part of the building. Most situations, the buildings are retained and is not sold at residual value. Residuals many not be relevant for some components.
- The need for componentising buildings will depend on the size and complexity of the building and materiality. The degree of componentisation will depend on the % of value, deterioration, and intervention level, all of which will impact on useful life. Componentisation to a degree that is a small % of the total asset value was considered not necessary for valuation however may be needed for renewal planning.
- There is a need to categorise buildings for sheds, sporting clubs, libraries etc. Consideration needs to be given to service levels and risks.
- The key findings for the project were that there is a lot more work to be done on buildings. The IPWEA workshop suggested developing a matrix defining service level, categories and components in order to develop useful lives.

6 Conclusions

When compared to the March 2009 “Infrastructure Asset Useful Lives” – SA Council Current Practice report, there has been a significant increase in the rigor by which Councils are assigning useful lives for Transport, CWMS and Stormwater assets.

This is reflected in the general improvement in the use of asset systems in both metropolitan and regional Councils. There is evidence that assets are being componentised and that local knowledge is being applied to help justify useful lives.

The report helps provide an opportunity for all Councils to benchmark useful lives with other Councils and should help trigger a need for review or further justification if they lie outside the majority of responses.

While this report also collects some information on residuals and service levels there is a need now to develop some guidance in the way residuals are applied. In addition, service levels being delivered by Councils need to be reflected in the useful life assignment.

It is evident given the lack of response to the building asset class, that future work can be done specifically to clarify appropriate componentisation, and use of residuals linked to service levels for buildings.

This report provides a significant amount of detail that can be used to inform the assumptions of useful life; however it is not intended to be a guide but a resource to help benchmark. Useful lives of similar assets can appropriately vary within and across Councils for a range of legitimate reasons. It is a requirement for each Council to ensure the local conditions and service levels are being considered and understood when adopting useful lives for their assets.

7 References

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3. SA Local Government Financial Management Group Infrastructure Asset Accounting Policy Review Phase 2 Report (April 2005), *Team Synergy Management Consultants*
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5. Infrastructure Asset Useful Lives – SA Council's Current Practice, (March 2009) Tonkin Consulting
6. IPWEA, 2009, 'Australian Infrastructure Financial Management Guidelines', IPWEA, Sydney.