

Infrastructure Asset Useful Lives

SA Councils' Current Practices

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1. Introduction

The LGA approached Tonkin Consulting in late 2007 with a request to prepare a report detailing the current practices of South Australian Councils relating to the useful lives of infrastructure assets.

In March 2008, Tonkin Consulting was commissioned to undertake a study of a sample set of South Australian Councils and collate and analyse the useful lives that are currently used. This report details the findings of that study.

2. Background

Over several years, there has been a considerable amount of research and investigation undertaken into the accounting for Infrastructure Assets.

Team Synergy (Nov 2004 and April 2005) prepared a paper on Infrastructure Asset Accounting Policy Review that reported on all facets of Asset Accounting. With regard to useful life, these reports provided an overview of lives used and reported that "of all the calculations required, estimating useful life of infrastructure assets is the most difficult". Of the useful lives used by participating Councils in the study, it was reported "the range of lives for similar assets is extraordinary".

The LGA Information Paper "Depreciation and Related Issues (Jan 2008)" provides further comments on depreciation in relation to AASB:116 and its application to depreciation in a local government context.

Councils are required to report their depreciation expenses relating to infrastructure assets as part of their annual operating expenses. Depreciation is a method of apportioning the expense of an asset over the duration of its useful life and reflects consumption of the asset over that time. Whilst this is a standard accounting practice across many industries it is particularly important for the local government sector where depreciation expenses make up a large portion of the reported operating expenses.

The above mentioned reports have highlighted the importance of estimating depreciation, which for infrastructure assets still remains a significant challenge for Councils. These studies have also expressed concern at the methods currently being employed by Councils to calculate depreciation and values being obtained from these methods.

The LGA has requested Tonkin Consulting to produce a report that details the current practice of Councils and document the useful lives currently being adopted for various asset classes. This report expands on the work already undertaken to focus on the depreciation rate expressed in terms of useful life. It is intended this report would 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, stormwater and Community Wastewater Management Systems (CWMS).

3. Methodology

3.1 Overview

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

1. Reviewing the existing in-house data to determine how best to "group" assets based on factors affecting consumption i.e. material type, use, etc;
2. Prepare a questionnaire and source data from approximately 20 Councils;
3. Review sourced data and collate from 14 of the 20 Councils; and
4. Summarise findings and document current practice based on data received.

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 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

Although the 20 Councils were approached and asked to participate, 14 Councils supplied useful lives. These included:

- 2 Large Metropolitan Councils;
- 5 Small-Medium Metropolitan Councils;
- 2 Central Region Councils;
- 1 Eyre Peninsula Council;
- 1 Murray & Mallee Council;
- 2 Southern & Hills Councils; and
- 1 Spencer Gulf 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; and
- Some Councils have incomplete asset registers.

A summary of the responses is provided in the following sections with the lowest and highest useful lives noted together with the average (mean) and median.

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.

Table 4-1 - Urban Sealed Surface Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
Normal Use Hotmix	11	20	30	26	25
High Use Hotmix	8	18	28	22	21
Normal Use Spray Seal	13	13	30	20	20
High Use Spray Seal	7	15	22	18	20
Normal Use Cold Overlay	8	10	25	16	15
High Use Cold Overlay	3	7	16	13	15

A single option for unsealed urban roads was provided and the results are provided below.

Table 4-2 – Urban Sheeted Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
Township Sheeted	9	5	20	15	15

4.2.2 Rural Surfaces

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

Table 4-3 – Rural Sealed Surface Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
Normal Use Hotmix	3	19	26	23	25
High Use Hotmix	2	16	26	21	21
Normal Use Spray Seal	2	16	30	22	20
High Use Spray Seal	1	15	20	17	16
Normal Use Cold Overlay	6	16	19	17.5	17.5
High Use Cold Overlay	6	16	16	16	16

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

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

Accordingly, useful lives have been categorised by road hierarchy and material type as shown below:

Table 4-4 – Rural Sheeted Surface Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
Rural Arterial (Poor Material)	2	5	13	9	9
Rural Arterial (Good Material)	6	10	20	15	14
Rural Collector (Poor Material)	3	5	24	12	8
Rural Collector (Good Material)	7	12	27	18	15
Rural Local (Poor Material)	3	6	19	12	10
Rural Local (Good Material)	7	15	35	23	20
Rural Track (Poor Material)	4	10	24	16	15
Rural Track (Good Material)	3	30	55	38	30

4.3 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.

Table 4-5 – Road Pavement Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
Normal Use	11	50	100	77	80
Heavy Use	10	20	60	47	50

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:

Table 4-6 – Footpath Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
Block Paved	12	10	50	43	50
In situ Concrete	13	20	50	44	50
Hotmix	12	20	50	29	28
Spray Seal	8	10	50	23	20
Crusher Dust	10	10	50	19	15

4.5 Kerb & Gutter

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

Table 4-7 – Concrete Kerb & Gutter Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
Upright Kerb & Gutter	12	40	75	65	70
Median Kerb	11	30	75	59	70
Valley Drain	10	40	75	65	70

4.6 Stormwater

Standard lives for each pipe material and drainage structure type are provided below:

Table 4-8 – Stormwater Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
RCP ¹	8	50	100	89	100
FRC Pipe ²	4	80	100	95	100
uPVC ³	5	20	100	70	80
Box Culvert	6	50	100	73	75
SEP ⁴	4	50	80	60	55
JB ⁵	4	50	80	60	55
Headwall	5	50	80	58	50
Lined Channel	4	50	100	78	80
Unlined Channel	4	10	100	78	100

4.7 Community Wastewater Management System (CWMS)

Standard lives for CWMS infrastructure are given below:

Table 4-9 – CWMS Lives

Asset	Sample (no.)	Lowest (years)	Highest (years)	Average (years)	Median (years)
Earthenware Gravity Pipe	2	50	50	50	50
PVC Gravity Pipe	2	50	50	50	50
PVC Rising Main Pipe	2	50	50	50	50
Pump Chamber	3	30	100	60	50
Pump	3	30	50	43	50
Pump Mechanical & Electrical	3	25	50	35	30

- ¹ RCP – Reinforced Concrete Pipe
² FRC - Fibre Reinforced Concrete
³ uPVC – Unplasticised Polyvinylchloride
⁴ SEP – Side Entry Pit
⁵ JB – Junction Box

5. Summary of Findings

5.1 Overview

This study has identified the variation in useful lives assumed by a selection of Councils for various asset types and will provide assistance to all Councils in assessing the lives they assign for infrastructure assets.

Councils should categorise assets into groups on the basis of similar consumption patterns for the purpose of determining useful life.

For example one Council in this study assigned all footpath useful lives equal to 50 years where other councils allocated different lives based on footpath type.

The following comments are made for each asset type:

5.2 Road Surface

5.2.1 Urban Sealed

The data on urban sealed surfaces in this report includes all the sealed surfaces from the metropolitan Councils as well as the sealed township roads in the rural Councils. All but one Council provided useful lives for urban sealed surfaces. The useful lives adopted by most Councils appeared to be consistent. On examining the data it was found that where Councils assigned useful life for a particular urban sealed surface differed greatly to that used by other Councils for that surface it was usually because that Council was assigning the same useful life for all types of sealed surfaces.

Hotmix useful lives appeared consistent between Councils, with a life of 25 years adopted by most Councils for normal use roads.

The useful lives assigned for spray sealed and cold overlay roads varied depending on the type of Council. For normal use:

- Metro Councils adopted useful lives less than 20 years; and
- Rural Councils adopted useful lives greater than 20 years.

The levels of service accepted, type of traffic and volume of traffic will affect the determination of useful life of a surface and these will be specific to individual Councils. Given the relatively short useful life of surface assets and the length of sealed surfaces in most Council networks it is anticipated that, with appropriate asset management registers, it should be possible for Councils to keep records of the useful lives they are obtaining from their surfaces.

5.2.2 Urban Sheeted

Most Councils submitted a life for urban sheeted roads. The reported useful lives for urban sheeted surfaces were consistently 15 or 16 years with only a few Councils reporting longer or shorter useful lives. It is expected that these lives will vary between Councils due to different traffic volumes and tolerance to surface wear. Due to the relatively short life of these assets, if asset registers are kept up to date it should be possible for Councils to monitor the performance of these assets and get a reasonable estimate of useful life. There may be a case to extend the useful life of urban sheeted surfaces where lower levels of service are tolerable within small and remote townships.

5.2.3 Rural Sealed

All but one of the non metropolitan Councils that responded provided lives for sealed surfaces. A large portion of South Australia's rural sealed roads are spray sealed and therefore a large number of responses were received for spray seal lives, with fewer responses being received for hotmix and cold overlay surfaces.

The results were consistent, with most Councils reporting similar useful lives for all rural sealed surface types. One Council adopted a useful life of 30 years for regular use spray seal. Whilst this may be reasonable, adopting useful lives of above 20-25 years should be supported by historical performance.

Any resealing strategy should consider the protection of the underlying pavement asset together with community safety and serviceability.

The lives for rural sealed roads tend to be lower than that of township roads of the same surface in the same Council. This would seem to be appropriate as the rural roads tend to cater for higher operating speeds than township roads and therefore a higher standard should be maintained for safety reasons. Some Councils do however adopt the same useful life for both township and rural seals. It is important that Councils consider whether this is an accurate reflection of consumption.

5.2.4 Rural Sheeted

A large number of responses were received for all the categories of rural sheeted roads. The data collected contained a wide spread of useful lives with some Councils reporting useful lives for rural sheeted surfaces two to three times greater than those reported by other Councils. This is to be expected as the performance/life of sheeted roads is greatly affected by the following factors:

- Material used in construction (usually sourced locally);
- Traffic volumes;
- Weather conditions; and
- Subgrade condition.

Some Councils responses indicated that they expect the useful life to more than double depending on where they sourced the material. It is recommended that Councils asset registers record the material used for sheeting as well as the class of road and any other factors that influence consumption.

It is important that Councils monitor the performance of their sheeted network to establish a set of standard lives that appropriately reflect the service required for the different categories of roads.

5.3 Other Road Assets

5.3.1 Pavement

Almost all Councils that responded to the survey provided a value for road pavement. Road pavements are long lived assets and therefore there is less information available about the frequency of their reconstruction.

There was a reasonably large spread of values received for both the regular use and high use pavements. The difference in life between a regular and a high use pavement also varied from Council to Council. The useful life of a pavement will be affected by Council specific factors such as:

- Subgrade reactivity or stability;
- Frequency of resealing and maintenance; and
- Traffic loading.

For this reason variations between Councils are to be expected however it is recommended that Councils regularly compare their adopted lives to performance of pavements in the field to ensure the adopted lives are consistent with actual pavement performance.

Several of the responses received appeared to be significantly lower than the rest, with one Council adopting a life of 20 years for high use pavements. Adopting a value this low will result in a large annual depreciation expense appearing on Council's operating statement. Careful consideration is needed when assigning pavement lives considerably less than the average and median values shown in this report to ensure that this life reflects the unique factors impacting on road pavement consumption in the local area.

5.3.2 Concrete Kerb and Gutter

The majority of the Councils participating provided useful lives for kerbing and these were generally consistent across all Councils. This is expected as concrete is a uniform material and kerbing will be less affected by traffic volumes etc. than other road assets such as surfaces. Notwithstanding this kerb life will be influenced by subgrade conditions and it is advised that Councils monitor kerb performance and not simply adopt a generic life.

A life of 70 years has been adopted by most Councils for upright kerb, median kerb and spoon drains although some Councils have adopted lower values particularly for median kerb, which normally occurs in central islands where vehicular impact is greater than for edge barrier kerbing.

5.3.3 Footpath

The majority of Councils provided useful lives for all types of footpath. The results were generally fairly uniform although some Councils reported useful lives that differed substantially from the average. As is the case for any asset, the useful life of a footpath is often dictated by the level of service that will be tolerated by a Council. For inner metropolitan Councils where aesthetics and public safety are key drivers will have higher service levels than most rural townships.

5.4 Stormwater Assets

5.4.1 Open Channels

Only four Councils reported useful lives for open channels. The results differed greatly with:

- Unlined channels varying from 10 to 100 years life; and
- Lined Channels varying from 50 to 100 years life.

This differential will be reflected in widely different depreciation costs for the same assets between Councils. Councils should consider their maintenance and renewal treatments of open channels and ensure this is reflected in the useful lives they assign to these assets.

5.4.2 Pipes

Over half the Councils provided useful lives for stormwater pipe. The life adopted varied from Council to Council but was generally 80-100 years for RCP and FRC pipes with shorter lives assigned to uPVC pipes and box culverts.

Stormwater pipe is made to standard specification so unless it is subjected to unique conditions its useful life should be consistent between Councils.

It was noted however that some Councils were adopting a single life for all pipe types. It is recommended that separate lives be adopted for different pipe types/materials.

5.4.3 Drainage Structures

Only one third of the Councils responded with useful lives for drainage structures. These Councils reported useful lives of 50-80 years. It is expected that the life of a drainage structures, like pipes, should not vary significantly between Councils. Councils may need to consider whether replacing the lids of SEPs or JB is treated as maintenance or renewal.

5.5 CWMS

The information received from Councils on CWMS was limited.

It is recommended that CWMS be recorded in assets registers in their component parts and that useful lives are assigned for:

- Pipes of each material;
- Pumps;
- Pump Chambers; and
- Pump Station Electrical.

This is an area of further development by Councils.

6. Conclusions

Upon review of the responses submitted by the Councils involved, it appears that the rate at which assets are being depreciated varies between Councils. In some cases this is appropriate due to Council specific conditions and in other cases this appears to be due to insufficient data being recorded in Councils' asset management systems.

As a result of this study, the following considerations would improve the reporting of depreciation by Councils:

1. Assets should be split into component parts that reflect the rate at which an asset is consumed;
2. Separate standard lives should be determined and allocated to components that are consumed at different rates due to material or use;
3. Records of all construction and maintenance works should be kept in an asset register in order to develop a knowledge base for future reference and refinement of asset useful lives;
4. Whenever possible the useful lives of assets should be based on a Council's local experience or records; and
5. Monitoring of the condition of assets should ensure that the actual consumption of assets is consistent with the useful life being reported.
6. The Local Government sector should build on the data in this paper to establish a comprehensive reference document and to increase the number of Councils contributing to the assessment of all Councils' data on useful lives for a wide range of infrastructure assets. This should be achieved through the improvement of practices across the sector in asset register development.

7. References

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