Implementation of consumption-based depreciation

By **David Edgerton**

The requirements of the National Framework for Financial Sustainability of Local Government are leading councils to review their asset depreciation models as part of developing a robust Asset Management Framework.

In recent years there has been significant discussion about how best to value and depreciate infrastructure assets. Since the early 1990s there has been increasing awareness of the limitations of the traditional straight-line approach. This has led to the development of numerous Condition Based Depreciation and more recently Consumption Based Depreciation methodologies.

The main difference between each methodology is the factors used to assess the level of remaining future economic benefit (WDV) and the rate of consumption of the future economic benefit (Depreciation). Table 1 provides a summary of the factors used to determine the valuation and depreciation expense.

Table 1

Traditional Straight-Line	Condition Based Depreciation	Consumption Based Depreciation
Factors Used: Age only Typically uses Actual Age plus RUL to calculate a Total Useful Life. WDV is then determined by RUL/Total Life – Residual.	Factors Used: Physical Condition Typically a degradation profile is created based on a model that correlates the physical condition to an estimated total life cycle.	Factors Used: Holistic and Component Specific Factors Considers factors such as functionality, capacity, utilization, obsolescence, etc at the whole of asset level. Then takes into account the physical condition and repair and maintenance history of the asset to determine the level of remaining service potential. A Dynamic Matrix is created to link the level of service to the valuation and depreciation.

A number of Queensland and NSW councils with the assistance of APV, recently developed Consumption Based Depreciation methodologies across all asset classes. The councils involved include a range of small, medium and large councils including Maryborough, Logan, Burdekin, Goondiwindi, Miriam Vale, Wagga Wagga and Griffith.

At the time of writing this article, a number of other councils have also commenced the process. This article provides an overview of the process used which resulted in significant reductions in depreciation expense as well as proving councils with the base to develop a robust Asset Management Framework consistent with the requirements of the National Framework for Financial Sustainability of Local Government.

While some of these councils have valued their assets for many years on the Fair Value basis there was always a significant level of concern expressed in relation to the relevance of the figures reported in the financial statements, the amount of depreciation expense and in particular the level of unfunded depreciation. Many of the councils also had a long-standing commitment to improving their asset management capabilities but with limited resources and funding were limited in their ability to develop a robust quality system.

Typical of most local governments, there has been a longstanding agreement between all stakeholders of the need to integrate their accounting and engineering systems. However, there was also a significant level of frustration borne out of the sparseness of methodologies or systems that enabled full integration of both accounting and engineering functions as the number of different Asset Registers within council.

Maryborough City Council is a good example of the process used to develop the Consumption Based Depreciation Methodology. Maryborough City Council initially selected APV to values its Land and Buildings portfolio as at 30 June 2007. In the past the valuations had been provided by a range of suppliers (engineers and valuers) with valuations calculated using the traditional straight-line approach.

This involved setting a Total Useful Life for each asset type and based on physical inspection estimating the Remaining Useful Life. Typically Residual Values were set at nil and buildings were not componentised as required by AASB 116. This approach, while managing to satisfy audit in previous years, was the source of concerns over the relevance and reasonableness of the figures produced.

To address these concerns APV suggested using the Advanced SLAM Consumption Based Depreciation methodology to provide a link between the engineering data and the accounting results. The Advanced SLAM methodology forms part of the Prabhu-Edgerton Consumption Model but focuses on the asset accounting aspects. The Prabhu-Edgerton Consumption Model also incorporates long-term funding and pricing implications based on establishing appropriate levels of service. Further information on the model is available from www.apv.net.

Soon after commencing the process the benefits of the approach were abundantly clear and council decided to expand the project across all asset classes including roads, water and sewerage. The process involved a series of workshops where we were facilitated through a number of steps. These included setting out the methodology and ensuring that all relevant stakeholders were involved in the process. This included identifying the

types of assets, hierarchies based on Levels of Service, the treatments (and associated costs) normally applied to assets, decision making factors applicable to their unique circumstances, development of a dynamic matrix to provide an objective method to assess condition and finally development of the lifecycle phases for each asset type and component.

Each dynamic matrix included an assessment of 'holistic' factors such as functionality, capacity, obsolescence, utilisation, safety and equitable access as well as 'component specific' factors such as physical condition and repair history. This provided a mechanism to objectively measure the Level of Service and is similar to the 'star rating' system.

APV subsequently produced a fully documented Depreciation Methodology which included separate manuals for each class of asset as well as a high level overview document. These included distinct Consumption Profiles for each component of each asset type as well as detailed explanation and support for each critical assumption. For example – buildings were componentised into floor, envelope, floor coverings, internal fit out, roof, mechanical services and other services. Separate profiles were developed for timber, concrete, cavity brick, colour bond, etc.

Figure 1 provides an example of a Consumption Based Depreciation profile. Condition Ratings were assigned based on a scoring system as follows. This also provides a reference point to 'star ratings'.

APV subsequently valued the assets by determining the Gross Current Replacement Cost and using the Condition Rating and Consumption Profile calculated the Written Down Value (Fair Value) and Depreciation Expense. The system allowed for WDV and Depreciation Expense to be calculated either by the Straight-Line Method or the Consumption Based Method. The Consumption Based Method resulted in significant reductions (>20%) in depreciation expense for all classes except water and sewerage. These increased, reflecting the serious need to undertake significant renewal treatments in the short term.

The results were supplied to council in 'MyValuer' which is the base Asset Register component of the ASSETIC Asset Management System. MyValuer was populated via the data exchange with separate sections created for each asset class (refer Figure 2). The ASSETIC system also incorporates an advanced Optimised Decision Making predictor tool

Phase Points	Description	Star Rating
0	Brand New or very good condition – **Very High level of service**	★★★★★
1	Not new but in Very Good condition with no indicators of any future obsolescence and providing a **high level of service**	★★★★
2	Aged and in good condition provide an **adequate level of service**. No signs of immediate or short term obsolescence	★★★
3	Providing an **adequate level of service but some concerns** over the ability of the asset to continue to provide an adequate level of service in the short to medium term. May be signs of obsolescence in short to mid-term.	★★
4	Indicators that will need to renew, upgrade or scrap in near future. Reflected by **inclusion in the Capital Works Plan** to renew or replace in short-term.	★
5	At intervention point. **No longer providing an acceptable level of service**. Requires immediate renewal.	No Stars
End of Life	Theoretical end of life	

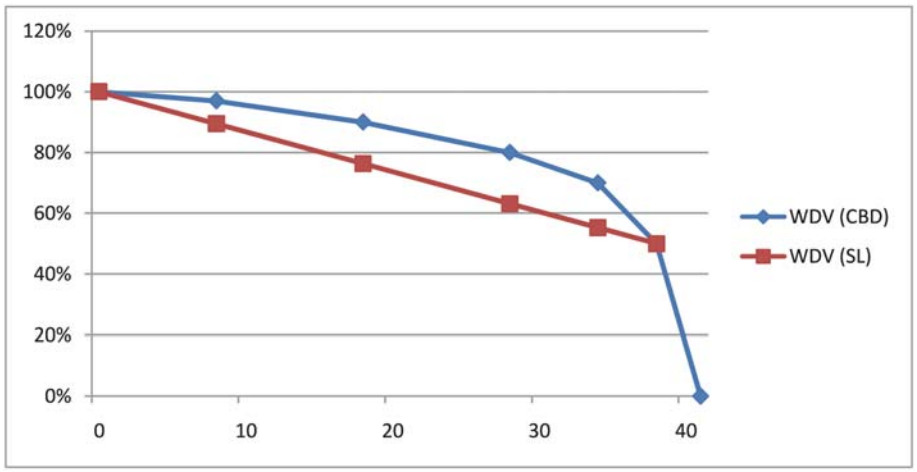
Figure 1. Example Consumption Based Depreciation.

Profile

Asset Class	**Buildings**
Component	**Roof**
Type / Class	**Colour Bonded Metal Decking**

	Phase						
Details	**0**	**1**	**2**	**3**	**4**	**5**	**6**
% RSP	100%	97%	90%	80%	70%	50%	0%
Min Time	4	5	5	4	3	2	
Max Time	11	15	15	8	5	4	
Avg Time (Rounded)	8	10	10	6	4	3	
Depr Rate	0.38%	0.70%	1.00%	1.67%	5.00%	16.67%	

	Min	Max	Assumed
Total Life (Theoretical End of Life)	23	58	41
Common accepted Design Life			40
Useful Life (Econ Life -to point of intervention)	21	54	38
Residual Value (as point of intervention)			50%
Traditional Straight-Line Depreciation (Gross - RV) / Econ Life			1.32%



Notes

The lifecycle of a metal roof is highly dependent on environmental factors and as a consequence it can range anywhere from 20 years to 50 or more. Repairs are generally done when still in condition 1 or 2 as only need to replace a few sheets. Full renewal only replaces the sheeting and not the trusses. Hence RV = 50%

Figure 2. Asset Register Structure.

(MyPredictor). MyPredictor is able to use the asset lifecycles, alternative treatments and maintenance costs to produce 10 year financial models and Asset Management Plans based on defined Levels of Service.

MyValuer was programmed with the consumption profiles for each asset component and type and can be used to run valuation and depreciation calculations in future years. Figures 3 and 4 show examples of the programming of the consumption profiles.

The Condition Assessments were also recorded against each asset (Figure 5). Based on the Consumption Profiles developed through the process the system then produced valuation and depreciation figures using both the Straight-Line and Consumption Based Depreciation methodologies (Figure 6).

Overall, the process to develop and implement the methodology across all asset classes took less than three months. This included a month or so to engage all the stakeholders in the process and develop the methodology based on Maryborough's unique asset management practices. Surprisingly, the initial condition assessments provided by council were able to be completed within a few days based on the knowledge held by the works depot and other experienced staff. This was followed by inspection and validation by APV staff and preparation of the final valuation reports and depreciation methodologies. It is intended that the learning from this process will be utilised further down the path to develop robust Asset Management Frameworks and Asset Management Plans utilising the capability of the Assetic 'MyPredictor' tool.

- **The author, David Edgerton, is a Director of APV Valuers and Asset Management, a firm that specialises in the valuation of the local government sector. He is also an active member of the Institute of Public Works Engineering Australia (IPWEA) and has provided comments on the development of the NAMS.AU Australian Infrastructure Financial Management Guidelines. In 2001 he was the recipient of the 2001 National Public Sector CPA of the Year Award. He can be contacted at David@apv.net Tel (07) 3221 3499 or (02) 8231 6499.**

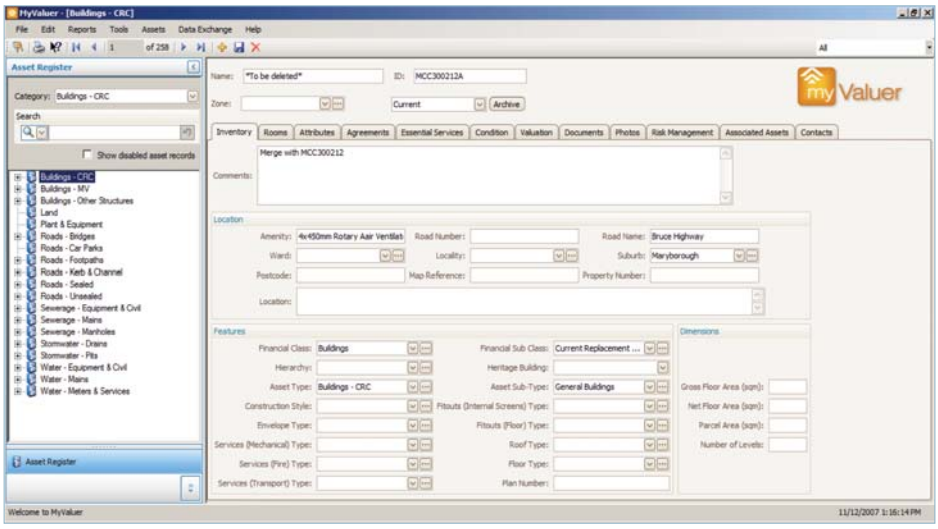


Figure 3. Consumption Profiles - Roads.

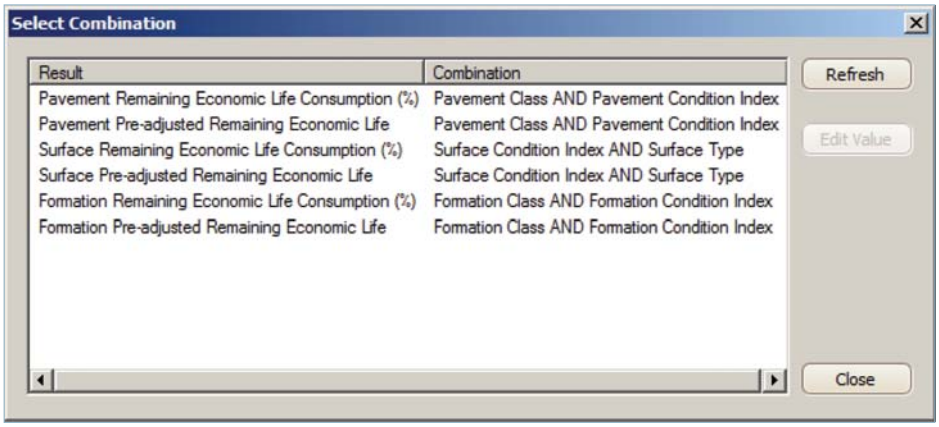


Figure 4. Example – Programming of Consumption Profile (Asphalt – STD).

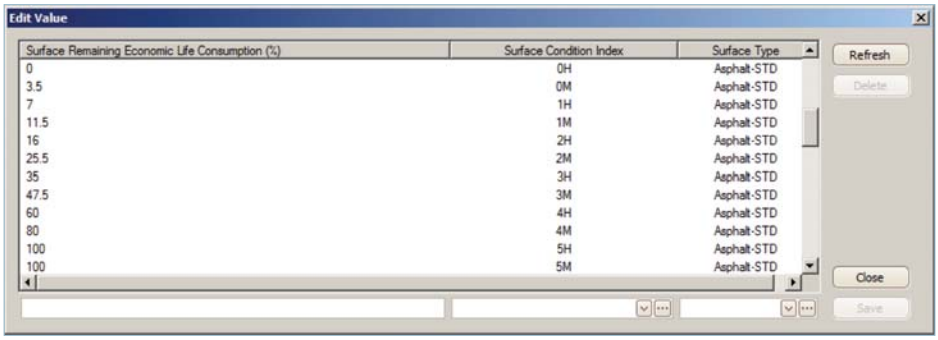


Figure 5. Condition Rating.

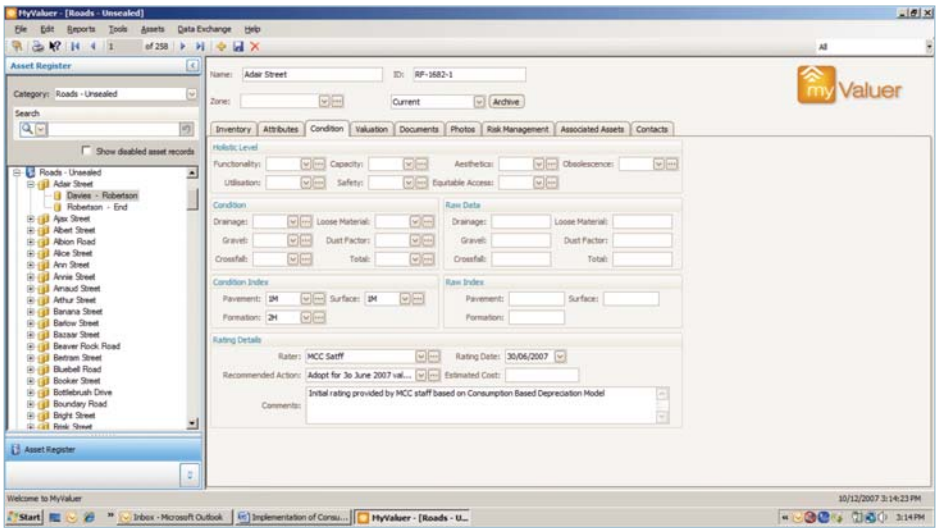


Figure 6. Valuation and Depreciation Calculations