South Australia Local Government Association

Information Paper

DEPRECIATION OF INFRASTRUTURE ASSETS

July 2008

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INTRODUCTION

Depreciation is an accounting concept that measures and spreads the cost associated with the using up of an asset over its useful life. Australian Accounting Standards define depreciation as 'the systematic allocation of the depreciable amount of an asset over its useful life'. For most Councils depreciation is the second largest expense item appearing in their annual income statements (employee costs is usually the largest).

The Independent Inquiry into the Financial Sustainability of Local Government conducted in 2005 recognised the significance of Councils' annual depreciation expense to their financial positions. The Inquiry also noted concerns within Local Government about the reliability of recorded depreciation data and made recommendations aimed at:

> *"improving the consistency and comparability of accounting policies impacting upon the measurement of the key financial sustainability indicators, especially depreciation and other assets accounting policies."*

Implementing soundly-based depreciation and other asset management policies is central to the achievement of comparability in the measurement of Councils' financial performance and position and to this end the Inquiry noted that;

> *"Standardising depreciation (and asset valuation) policies, and ensuring their correct implementation, must be a high priority for local government in South Australia."1*

This information paper deals with the topic of depreciation of infrastructure assets. The objective of this paper is to provide a technical resource to supplement other publications such as the Australian Infrastructure Financial Management Guidelines (AIFMG) that are currently being developed by the Institute of Public Works Engineering Australia.

The paper has been divided into several sections. These include –

- Context
- Overview of Prescribed Requirements
- Considerations
- Key Aspects: Accounting Standards
- Application: Overview
- Application: Practical

[1] LGA South Australia Information Paper 17: Depreciation and Related Issues June 2008

CONTEXT

Objective

"Depreciation" is defined and its associated requirements are specified in Australian Accounting Standard AASB 116 "Property Plant and Equipment". *The objective of this Standard is to prescribe the accounting treatment for property, plant and equipment so that users of the financial report can discern information about an entity's investment in its property, plant and equipment and the changes in such investment.*[2]

Depreciation is defined as *"the systematic allocation of the depreciable amount of an asset over its useful life."*[3] Furthermore, AASB 116 requires *"The depreciation method used shall reflect the pattern in which the asset's future economic benefits are expected to be consumed by the entity."*[4]

Accordingly, the purpose of depreciation is record the value (or cost) of the asset that has been consumed during the accounting period so that users of the financial statements can discern information about the council's assets. Its purpose is solely for financial reporting and is not intended for any other purpose.

Materiality

Depreciation is recognised in the financial statements as an expense item within the Profit and Loss Account. The quantum of depreciation expense varies from council to council depending upon the nature, extent and age of the infrastructure base combined with the effectiveness of the asset management framework.

Typically depreciation expense comprises between 25% - 40% of total expenses and as a result is considered extremely material. Combined with its subjective nature it is also considered by auditors to represent an extreme risk within the audit process.

Relationship with Future Funding Needs and Rates

Some entities have attempted to use depreciation for purposes other than as a measure of the value of the asset consumed during the year. In particular, many have used the figure as either –

- a de-facto measure of the amount of future funding required to replace the existing asset (future funding needs)
- or alternatively as a mechanism to set user charges or rates (budgeting)

[2] AASB 116 Paragraph 1
[3] AASB 116 Paragraph 6
[4] AASB 116 Paragraph 60

There is no relationship between depreciation and either of these two purposes. Given the significant investment by councils in infrastructure assets and the associated proportion of total council funds allocated to the operation and maintenance of these assets, it is imperative that appropriate systems be put in place to better estimate the requirements for future funding needs (asset replacement and renewal) and the true cost to provide (and therefore charge equitably) services to the community using the assets.

OVERVIEW OF PRESCRIBED REQUIRMENTS

AASB 116 "Property Plant and Equipment"

The purpose of depreciation is record the value (or cost) of the asset that has been consumed during the accounting period so that users of the financial statements can discern information about the council's assets.

Most critical is the requirement that *the depreciation method used shall reflect the pattern in which the asset's future economic benefits are expected to be consumed by the entity*[5].

There are a number of other specific requirements prescribed by AASB 116. These include –

- Where the asset has a number of different components with varying patterns of consumption, each component is to be depreciated separately
- Depreciation is to be calculated on a systematic basis over its useful life
- A "Residual Value" needs to be determined and must not be depreciated
- As a minimum, the pattern of consumption, Useful Life and Residual Value need to be reassessed at year end and the depreciation method adjusted if there are any significant changes.

The specific requirements of the Standard include –

Para	Requirement
6	"Depreciable amount" is the cost of an asset, or other amount substituted for cost, less its residual value.
43	Each part of an item of property, plant and equipment with a cost that is significant in relation to the total cost of the item shall be depreciated separately.
50	The depreciable amount of an asset shall be allocated on a systematic basis over its useful life.
51	The residual value and the useful life of an asset shall be reviewed at least at the end of each annual reporting period and, if expectations differ from previous estimates, the change(s) shall be accounted for as a change in an accounting estimate in accordance with AASB 108 Accounting Policies, Changes in Accounting Estimates and Errors.
60	The depreciation method used shall reflect the pattern in which the asset's future economic benefits are expected to be consumed by the entity.
61	The depreciation method applied to an asset shall be reviewed at least at the end of each annual reporting period and, if there has been a significant change in the expected pattern of consumption of the future economic benefits embodied in the asset, the method shall be changed to reflect the changed pattern. Such a change shall be accounted for as a change in an accounting estimate in accordance with AASB 108.

[5] AASB 116 Paragraph 60

Interpretation 1030 "Depreciation of Long Lived Physical Assets: Condition Based Depreciation"

In addition to AASB 116 "Property Plant and Equipment" there exists an additional prescribed requirement of particular relevance to local government assets. UIG Accounting Interpretation 1030 "Depreciation of Long-Lived Physical Assets: Condition Based Depreciation and Related Matters.

The Interpretation identifies the characteristics of condition-based depreciation and other related depreciation methods that do not satisfy the requirements of Accounting Standard AASB 116 Property, Plant and Equipment. Such depreciation methods have been proposed to be applied in relation to long-lived assets such as infrastructure assets, particularly where the assets are subject to detailed management plans to maintain the service levels of the assets.[6]

The requirements of UIG Interpretation 1030 applies to all depreciation methods (not just Condition Based Depreciation methods) that are used to depreciate long-lived physical assets such as those typically controlled by local governments. For example – roads and bridges, water and sewerage infrastructure, buildings, etc. This includes straight-line depreciation methods.

This requirement is often incorrectly misinterpreted as prohibiting the use on Condition Based Depreciation. The requirement does not prohibit use of any method proving that it complies with the requirements of AASB 116. The requirement simply states that any method (including straight-line or any other method) that include any of five characteristics do not comply with AASB 116. In particular –

- Depreciation is not calculated by reference to the "depreciable amount"
- Appropriate consideration is not given to technical and commercial obsolescence
- Maintenance and Capital expenditure are not separable identified and accounted for in accordance with AASB 116
- Use of the "renewals annuity" method
- Depreciation is not calculated separately for each component.

Prior to 1997, the then relevant accounting standard (AAS4 "Depreciation") stated that the method of depreciation "should" reflect the pattern of consumption of the assets service potential. It also provided that where this was not easily determined that "straight-line depreciation" could be used due to its simplicity. However, in 1997 AAS4 was amended by removing the easy straight-line option and mandated that "*The depreciation method applied to an asset must reflect the pattern in which the asset's future economic benefits are consumed or lost by the entity.*[7]"

[6] Accounting Interpretation 1030

[7] AAS4 Depreciation Paragraph 5.1 (issued August 1997)

About this time it was recognised by some that the traditional straight-line method of depreciation did not deal well with long-lived assets that typically experienced renewal via cyclical maintenance. As a consequence, a number of alternative depreciation methodologies were put forward as alternatives. These included a number of different Condition Based Depreciation methodologies and, amongst others, included the Renewals Annuity approach.

UIG 30 (since re-issued as UIG Interpretation 1030) was issued to address some of the concerns raised about the various alternative methodologies and their impact on the financial statements. UIG Interpretation 1030 states "*Adoption of CBD or similar methods of depreciation can have a significant impact on the operating results of public and private sector entities. Differing views are held about the extent to which all, or some, CBD methods comply with the requirements of AASB 116. Concern has been expressed that, in the absence of specific authoritative guidance, diverse, and potentially inappropriate, practices may develop and/or become entrenched. Some commentators note that whatever the benefits of CBD and similar methods for asset management, cost projection, cash flow budgeting and pricing purposes, for financial reporting purposes the depreciation method adopted by an entity must comply with the requirements of AASB 116.*"[8]

The consensus view states –

> *8. Condition-based depreciation and other methods of depreciation of long-lived physical assets, including infrastructure assets, that include any of the following characteristics do not comply with AASB 116, and shall not be adopted:*
> *(a) the depreciation expense is not determined by reference to the depreciable amount of the asset;*
> *(b) the depreciation expense is determined without consideration of technical and commercial obsolescence, such as potential changes in consumer demand, and related factors which can influence the consumption or loss of future economic benefits during the reporting period;*
> *(c) expenditure on maintenance and on enhancement of future economic benefits are not separately identified where reliable measures of these amounts can be determined, and are not recognised as an expense of the reporting period in which the expenditure was incurred in the case of maintenance expenditure or as an asset in respect of asset enhancement expenditure;*
> *(d) the asset is presumed to be in a steady state and a "renewals accounting" approach is adopted whereby all expenditure on the asset is recognised as an expense in the period in which it is incurred without consideration of whether that expenditure enhances the future economic benefits of the asset; and*
> *(e) the major components of complex assets are not identified and are not depreciated separately where this is necessary to reliably determine the depreciation expense of the reporting period.*[9]

[8] UIG Interpretation 1030 Paragraph 6
[9] UIG Interpretation 1030

CONSIDERATIONS

Auditing Standards

Since 1 July 2006 the audits of all local governments are required to be conducted in accordance with the requirements of the Australian Auditing Standards (ASA).
There are two major differences between the new Australian Auditing Standards (ASA) and its predecessor the Auditing Practice Statements (AUP). They are –

- The ASAs now carry "force of law" whereas the AUPs were only a professional obligation and not a legally enforceable requirement.
- In the main, the word "should" has been replaced with the word "shall". This removes significant flexibility for the auditor to disregard or to choose not to perform certain audit procedures. The auditors are now compelled to complete all procedures as detailed in the Auditing Standards.

There are a number of Auditing Standards that have a direct impact in relation to infrastructure assets. These are –

- ASA 500 Audit Evidence
- ASA 540 Audit of Accounting Estimates
- ASA 580 Management Representations
- ASA 620 Using the Work of an Expert
- ASA 545 Auditing Fair Value Measurements & Disclosures

The Auditing Standards are based upon the concept of the auditor satisfying a number of audit assertions. These include –

(a) Assertions about classes of transactions and events for the period under audit:
- *(i) Occurrence - transactions and events that have been recorded have occurred and pertain to the entity.*
- *(ii) Completeness - all transactions and events that should have been recorded have been recorded.*
- *(iii) Accuracy - amounts and other data relating to recorded transactions and events have been recorded appropriately.*
- *(iv) Cut-off - transactions and events have been recorded in the correct accounting period.*
- *(v) Classification - transactions and events have been recorded in the proper accounts.*

(b) Assertions about account balances at the period end:
- *(i) Existence - assets, liabilities, and equity interests exist.*
- *(ii) Rights and obligations - the entity holds or controls the rights to assets, and liabilities are the obligations of the entity.*
- *(iii) Completeness - all assets, liabilities and equity interests that should have been recorded have been recorded. 10*

[10] Australian Auditing Standard ASA500 "Audit Evidence"

In essence, and in relation to infrastructure assets, they require the auditor to

- obtain sufficient and appropriate evidence over the completeness and accuracy of the asset register
- assess the appropriateness and logic of the valuation and depreciation methodologies
- ensure that the methodologies fully comply with the Australian Accounting Standards. In particular AASB116 "Property Plant and Equipment"
- assess the competence, experience and objectivity of any experts used within the valuation and depreciation exercise
- obtain representations from management over a range of issues
- obtain sufficient and appropriate evidence to support the critical assumptions used within the methodology.

Drivers of Consumption

Prior to adopting a depreciation method it is imperative that due consideration is given to the factors that drive the consumption of the assets service potential.

In particular –

- AASB 116 requires *"the depreciation method used shall reflect the pattern in which the asset's future economic benefits are expected to be consumed by the entity"*[11].
- UIG Interpretation 1030 prohibits the use of a methodology where *"the depreciation expense is determined without consideration of technical and commercial obsolescence, such as potential changes in consumer demand, and related factors which can influence the consumption or loss of future economic benefits during the reporting period"*[12]

There are many factors that drive the consumption of an asset's service potential and likewise, there are many different indicators of the impact of each factor. Additionally, factors that impact the remaining service potential of a particular asset may vary significantly to the factors impacting a different asset within the same class of asset. For example – the two roads may have been built in the same year and have identical physical attributes and condition ratings but may experience different deprecation patterns because a decision has recently been made to replace pipes running under one of the roads which in turn will require the complete destruction and re-build of the affected road.

AASB 116 requires that *"the future economic benefits embodied in an asset are consumed by an entity principally through its use. However, other factors, such as technical or commercial obsolescence and wear and tear while an asset remains idle, often result in the diminution of the economic benefits that might have been obtained from the asset. Consequently, all the following factors are considered in determining the useful life of an asset:*

[11] AASB 116 Paragraph 60

[12] UIG Interpretation 1030 Paragraph 8

(a) expected usage of the asset. Usage is assessed by reference to the asset's expected capacity or physical output.

(b) expected physical wear and tear, which depends on operational factors such as the number of shifts for which the asset is to be used and the repair and maintenance programme, and the care and maintenance of the asset while idle.

(c) technical or commercial obsolescence arising from changes or improvements in production, or from a change in the market demand for the product or service output of the asset.

(d) legal or similar limits on the use of the asset, such as the expiry dates of related leases."[13]

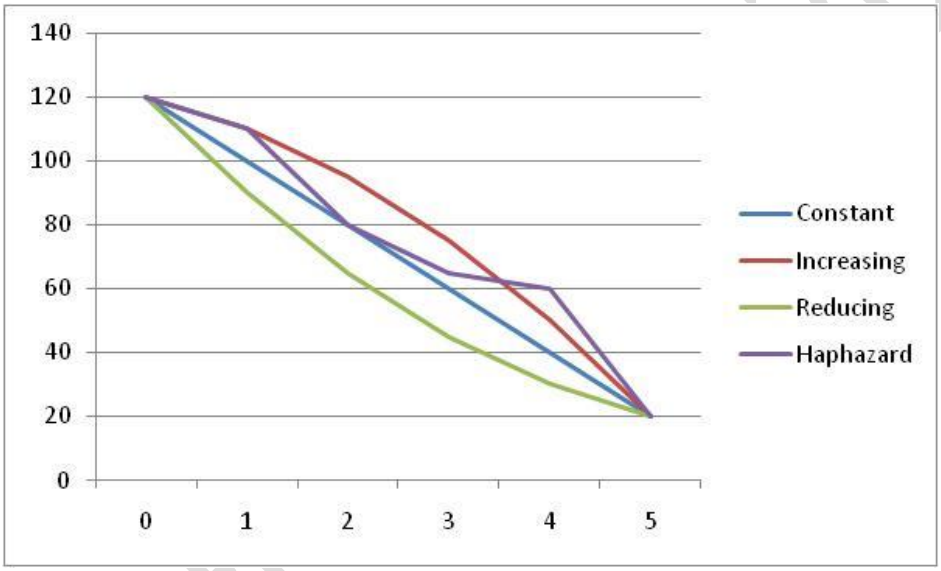
[13] AASB 116 Paragraph 56

KEY ASPECTS: ACCOUNTING STANDARDS

Pattern of Consumption

There are four alternative "patterns of consumption" which can be used –

Pattern of Consumption	Examples
Constant	Straight-Line
Increasing	Condition Based Depreciation Consumption Based Depreciation
Reducing	Diminishing Balance Method Condition Based Depreciation Consumption Based Depreciation
Haphazard	Units of Production



A variety of depreciation methods can be used to allocate the depreciable amount of an asset on a systematic basis over its useful life. These methods include the straight-line method, the diminishing balance method and the units of production method. Straight-line depreciation results in a constant charge over the useful life if the asset's residual value does not change. The diminishing balance method results in a decreasing charge over the useful life. The units of production method results in a charge based on the expected use or output. The entity selects the method that most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. That method is applied consistently from period to period unless there is a change in the expected pattern of consumption of those future economic benefits.[14]

[14] AASB 116 Paragraph 62

Useful Life

"Useful life" is defined as –

> *(a) the period over which an asset is expected to be available for use by an entity; or*
> *(b) the number of production or similar units expected to be obtained from the asset by an entity.*[15]

The useful life of an asset is defined in terms of the asset's expected utility to the entity. The asset management policy of the entity may involve the disposal of assets after a specified time or after consumption of a specified proportion of the future economic benefits embodied in the asset. Therefore, the useful life of an asset may be shorter than its economic life. The estimation of the useful life of the asset is a matter of judgement based on the experience of the entity with similar assets.[16]

Useful Life needs to be considered in the context of how the asset is consumed and the impact of cyclical maintenance. The renewal of an asset represents the disposal of the existing asset and the creation of a new asset with a new "useful life".

Extreme care needs to be taken to ensure that any formulas used to calculate the depreciation reference the appropriate fields within the Asset Register. The following example demonstrates the extreme risk for material misstatement caused by the incorrect application of commonly adopted formulas.

Example – Depreciation Methods and Assumptions

In this example, three different calculations have been performed using straight-line depreciation, using the same formulas and based on the same assumptions. However, only Method C calculates the WDV and depreciation expense correctly. The impact of the error for methods A & B are as follows –

	Method A	Method B	Method C
WDV	$25,000	36,667	40,000
%Error	(37.5%)	(8.3%)	-
Depreciation	$625	$333	$1,000
%Error	(37.5%)	(66.7%)	-

The formulas used are –

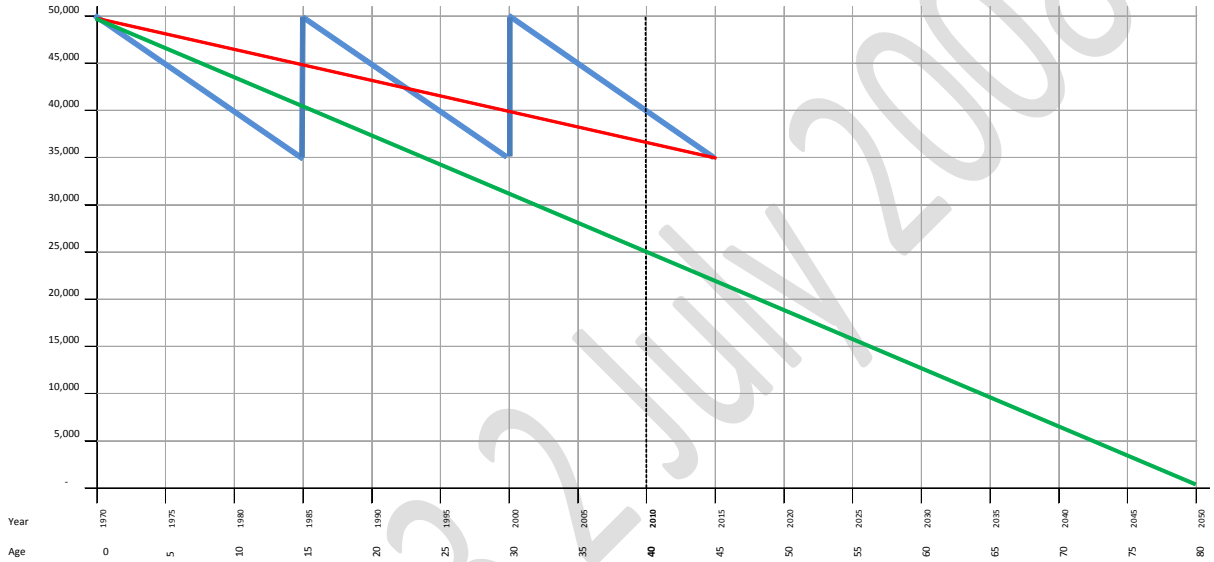
- Useful Life = Age + RUL
- Depreciation = (Gross – RV) / Useful Life
- WDV = Gross – (Depreciation * Age)

[15] AASB 116 Paragraph 6
[16] AASB 116 Paragraph 57

Assumptions –

- Asset originally commissioned in 1970 (now 40 years old)
- Based on current condition the RUL is assessed as 40 years.
- The Gross Cost of the asset is $50,000
- Every 15 years the asset is renewed at a cost of $15,000 which restores the asset back to "as new" with a Design Life of 50 years.

The following diagram shows the impact of the different methods and the error in calculation caused by referencing the formula to the incorrect data within the Asset Register.



	Method A	Method B	Method C
Gross	$50,000	$50,000	$50,000
Age	40 years (since date of commissioning)	40 years ((since date of commissioning)	10 years (date since last renewal)
RUL	40 years Based on current condition	5 years Based on estimated RUL till next renewal	5 years Based on estimated RUL till next renewal
Useful Life (Age + RUL = UL)	80 years	45 years	15 years
Residual Value	Nil Assets like these never sold	$35,000 Gross less renewal to bring back to "as new"	$35,000 Gross less renewal to bring back to "as new"
Depreciation (Gross – RV) / UL	$625 ($50k - $0) / 80	$333 ($50k - $35k) / 45	$1,000 ($50k - $35k) / 5

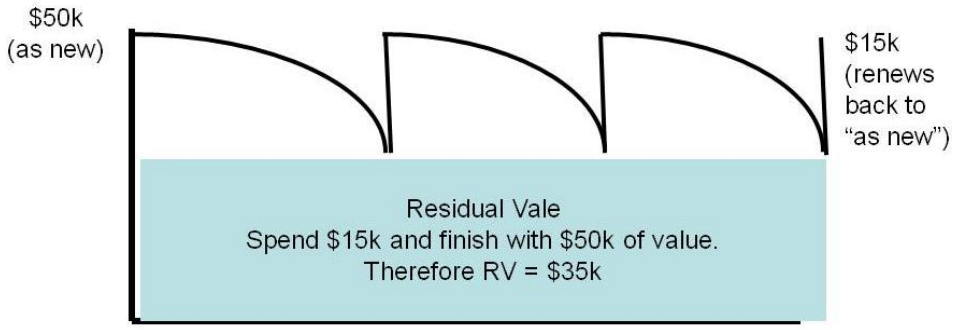
Residual Value

Residual Value is defined as –

> *the estimated amount that an entity would currently obtain from disposal of the asset, after deducting the estimated costs of disposal, if the asset were already of the age and in the condition expected at the end of its useful life.*[17]

The nature of most local government infrastructure assets is such that the assets cannot ever be sold. However, this does not mean they have no Residual Value.

In relation to cyclical maintenance assets, the renewal of an asset represents the disposal of the existing asset and creation of a new asset with a new "Useful Life". Using the example provided under "Useful Life", the Residual Value would be $35,000. This is because a renewal of $15,000 results in the creation of an "as new" asset with a Gross Value of $50,000. i.e. You spend $15,000 and get in an asset worth $50,000. Therefore the proceeds from the disposal of the old asset (Residual Value) is $35,000.



Depreciable Amount

The Depreciable Amount is defined as –

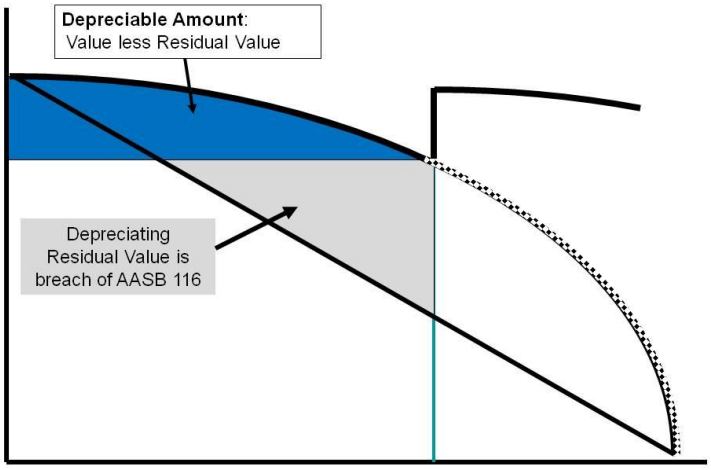
> *the cost of an asset, or other amount substituted for cost, less its residual value.*[18]

AASB 116 requires *"the systematic allocation of the depreciable amount of an asset over its useful life."*[19] By default, it does not allow the depreciation of the "non-depreciable" amount.

From a practical perspective, this means that the Written Down Value of an asset cannot be less than the Residual Value. The risk of this occurring is increased when the Residual Value of infrastructure assets is assumed to be nil without first considering the impact of asset management strategies employed at the council.

[17] AASB 116 Paragraph 6
[18] AASB 116 Paragraph 6
[19] AASB 116 Paragraph 6

For example, most assets tend to be renewed when they are delivering an adequate level of service because the community is not prepared to accept assets delivering poor levels of service. Typically the renewal treatment is less than the Gross Current Replacement cost and therefore indicates the existence of a Residual Value. If Residual Value is assumed to be nil, over time the entire value of the asset will be depreciated rather than just the depreciable amount. The risk is demonstrated in the following diagram.



Allowable Methods

Providing the depreciation method complies with the requirements if AASB 116 and UIG Interpretation 1030, any method of depreciation can be employed. However, care needs to be taken to ensure –

- All aspects of AASB 116 are complied with including -
  - Method must "match pattern of consumption"
  - Where the asset has a number of different components with varying patterns of consumption, each component is to be depreciated separately
  - Depreciation is to be calculated on a systematic basis over its useful life
  - A "Residual Value" needs to be determined and must not be depreciated
  - As a minimum, the pattern of consumption, Useful Life and Residual Value need to be reassessed at year end and the depreciation method adjusted if there are any significant changes.

- All aspects of UIG Interpretation 1030 must be satisfied. In particular, the method must ensure -
  - Depreciation is calculated by reference to the "depreciable amount"
  - Appropriate consideration is given to technical and commercial obsolescence
  - Maintenance and Capital expenditure are separably identified and accounted for in accordance with AASB 116.
  - The "renewals annuity" method is not used
  - Depreciation is calculated separately for each component.

In addition, consideration needs to be given to ensure that the auditors will be able to obtain sufficient and appropriate evidence with respect to the critical assumptions adopted within the methodology and that the methodology is logical and consistent with the entity's understanding of how the asset's service potential is consumed. This includes assumptions such as –

- Useful Life
- Residual Value
- Pattern of Consumption

Common methods adopted by local governments include the following –

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. Most commonly used with road pavements.	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.

The entity selects the method that most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. That method is applied consistently from period to period unless there is a change in the expected pattern of consumption of those future economic benefits.[20]

[20] AASB 116 Paragraph 62

APPLICATION: OVERVIEW

Selecting the Best Method

There is no "one best" method that should be applied across all assets. To be successful, the method must be cost effective and must "reflect the pattern of consumption" of the asset's service potential so as to enable the users of the financial statements to make sound economic decisions.

When selecting the best method to adopt, consideration should be given to –

- The nature and size of the portfolio
- The risk of material misstatement
- Whether the asset tends to be renewed through cyclical maintenance
- How often the asset is replaced
- How the asset's service potential is consumed
- Whether the information is reliable and relevant enabling it to be used to assist in other decisions across the local government

Traditional Straight-Line Depreciation

The traditional straight-line method is most suitable to short lived assets that do not experience renewal through cyclical maintenance. Typically these tend to be minor items of plant and equipment such as computers, office equipment, motor vehicles, etc. In these circumstances there is generally sufficient and appropriate evidence to support key assumptions such as Useful Life and Residual Value.

Where there is little evidence to support the critical assumptions or there is a high level of uncertainty regarding future projections of when and what renewal will occur, the appropriateness of this method becomes increasingly questionable.

The calculation is based purely on age. Where appropriate consideration is not given to technical or commercial obsolescence there is a risk of non-compliance with UIG Interpretation 1030.

Condition Based Depreciation

Condition Based Depreciation methods rely upon a known correlation between the physical characteristics of the asset (e.g. cracking, rutting, roughness, oxidisation) and the relevant remaining useful life.

It is generally only considered appropriate where the consumption of the asset is primarily dependent upon the physical condition of the asset. Care needs to be taken to ensure that the critical assumptions (correlation between each condition assessment and RUL) can be supported by sufficient and appropriate audit evidence.

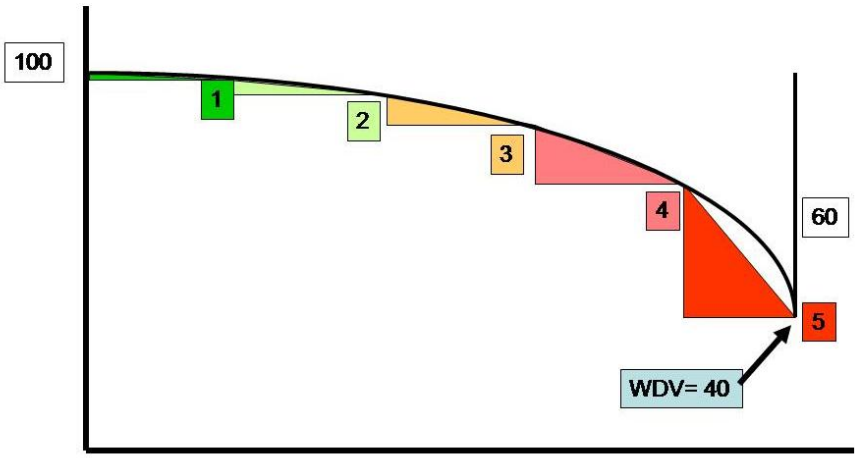
In some cases, the RUL of asset may be affected by non-physical factors. In these circumstances, if appropriate consideration is not given to technical or commercial obsolescence there is a risk of non-compliance with UIG Interpretation 1030.

Consumption Based Depreciation

Consumption Based Depreciation [21]is based on measuring the level of the asset's remaining service potential after taking into account both holistic and component specific factors. It was developed from the SLAM (Straight-Line Asset Management) methodology originally published in the "2000 Queensland Audit Office Better Practice Guidelines for Local Governments" and is commonly referred to as the Advanced SLAM methodology.

It relies upon the determination of a "pattern of consumption" consistent with the asset's Residual Value and path of transition through the various stages of an asset's lifecycle.

The method uses a Dynamic Matrix to identify a small number of Phases of the asset's lifecycle based on the factors that indicate how it is consumed. Based on the entity's knowledge of how long the asset transitions from Phase to Phase and the cost of the final renewal treatment a Valuation and Depreciation Model is determined. The Advanced SLAM [22]methodology is represented as follows –



The main advantages of this method are that -

- is that it enables a wide range of factors to be incorporated into the assessment process while delivering a simple and cost effective mechanism to assess the level of remaining service potential (WDV) and rate of depreciation
- it allows increased flexibility to provide different weightings for different factors depending upon which factors are impacting individual assets

[21] Prabhu-Edgerton Asset Management Consumption Model 2007 (www.apv.net/downloads)
[22] Prabhu-Edgerton Asset Management Consumption Model 2007 (www.apv.net/downloads)

- it significantly reduces the risk of material misstatement because the highest rate of depreciation coincides with the phases where there is the highest level of assurance over the critical assumptions
- sufficient and appropriate audit evidence is easily supported by the council's Asset Management Plans.

The method is best used for long-lived cyclical maintenance assets where there is little evidence to support the critical assumptions of alternative methodologies such as Straight-Line and Condition Based Depreciation.

Renewals Annuity

The Renewals Annuity method cannot be used for financial reporting purposes. It is specifically prohibited by UIG Interpretation 1030.

However, its use for financial modelling as part of the Asset Management Plan is highly recommended. The method assumes the existing assets will be maintained at a constant level of service via ongoing cyclical maintenance.

The net cash flows to undertake the maintenance and renewal are projected out over an extended period (e.g. 20 years) and are then converted to an annuity to provide an annualised average cost to maintain the asset.

This method provides an estimate of the amount of funding required to meet future needs and converts it to an annuity so that the relevant funds can be accumulated consistently and equitably over a long period so as to avoid sudden significant variations in funding needs.

APPLICATION: PRACTICAL

Components

Irrespective of the asset class, the first step is consideration of whether the asset is a "complex asset" meaning that it is comprised of a number of significant components with varying rates of consumption. If so (and most likely for infrastructure assets) it is imperative to identify the components which are to be valued and depreciated.

Assets valued at "Market Value" are generally considered to only have one component because the asset cannot be split into different components and sold separately. With a few exceptions, most infrastructure assets are deemed to be "complex" assets and are valued on the Depreciated Current Replacement Cost basis and not on the Market Value basis.

Types/Materials

Typically, a council will have a range of assets within the same Asset Class and the same Components but are either constructed of different materials or for environmental or other reasons are subject to differing "patterns of consumption".

Where the "pattern of consumption" for a particular "Type" is different from another "Type", separate depreciation rates are also required.

Structure of the Asset Register

Ultimately, every council is unique. Whether it is because of the different range of assets, asset management strategies, availability of funding or simply that the expectations of the community are different between communities requiring differing levels of service.

To be effective, the Asset Register needs to be structured so as to provide the necessary information to enable compliance with the Accounting Standards as well as assisting in the provision of good corporate governance which includes good Asset Management.

Consideration also needs to be given to "materiality" and the relationship between the cost of collecting data and the level of detail to be captured. For example, the cost of collecting data on 300 components of a building is significant. For an office building 5 – 7 components is probably sufficient.

Consequently, the setting of Asset Classes, Components and Types needs to be considered in light of the unique circumstances of the council and its information needs. The following schedules provide as guidance only of commonly adopted Asset Register Structures. A limited number of common examples are provided for "Type" as these tend to be unique for each council.

BUILDINGS AND OTHER STRUCTURES

Buildings (Complex)

Component	Type (examples only)
Floor	Timber, Concrete
Envelope	Timber, Concrete, Steel, Glass, Cavity Brick
Fit Out (Floors)	Carpet, Vinyl, Polished Timber, Tiles
Fit Out (Internal Screens)	Plaster Board, Timber Panel, Hardboard
Roof	Colour Bond, Cement Tile, Concrete
Mechanical Services	Air Conditioners - split, ducted and wall
Other Services	Fire, Emergency, Transport

Other Structures

Component	Type (examples only)
Fence	timber, steel, short life, long life
Hardstand	bitumen, gravel, concrete
Internal Roads	bitumen, gravel, concrete
Landscaping	water features, edging, paving
Retaining Walls	rock, timber, long life, short life
Security	lights, systems
Miscellaneous	swim pools, tennis courts

ROADS, BRIDGES AND STORMWATER

Sealed Roads

Component	Type (examples only)
Formation	Standard
Pavement	Standard, CBD
Seal	Asphalt, Chip Seal

Unsealed Roads

Component	Type (examples only)
Formation	Standard
Pavement	Standard, Gravel
Seal	Gravel

Bridges

Component	Type (examples only)
Super-Structure	Concrete, Timber, Steel Suspension
Sub Structure	Concrete, Timber, Steel Suspension
Rails	Concrete, Timber, Steel Suspension
Surface	Asphalt

Miscellaneous

Component	Type (examples only)
Footpaths	Concrete, Bitumen, Gravel, Paved
Kerb & Channel	Left, Right, Traffic Island, Concrete
Stormwater	Reline, No Reline, Concrete

WATER INFRASTRUCTURE

Passive Assets

Component	Type (examples only)
Mains	AC, uPVC, DICL, RCP
Hydrants & Valves	Standard, Pressure Reducing
Meters	Standard
Services	Standard

Active Assets

(Filtration Plant, Pump Stations, etc)

Component	Type (examples only)
Civil	Standard
Electrical	Standard
Mechanical	Standard, Bulk Flow Meter
Reservoirs	Concrete, steel
Bores	Standard
Weir	Concrete, Earth
Dam	Concrete, Earth
Levee Bank	Earth

SEWERAGE INFRASTRUCTURE

Passive Assets

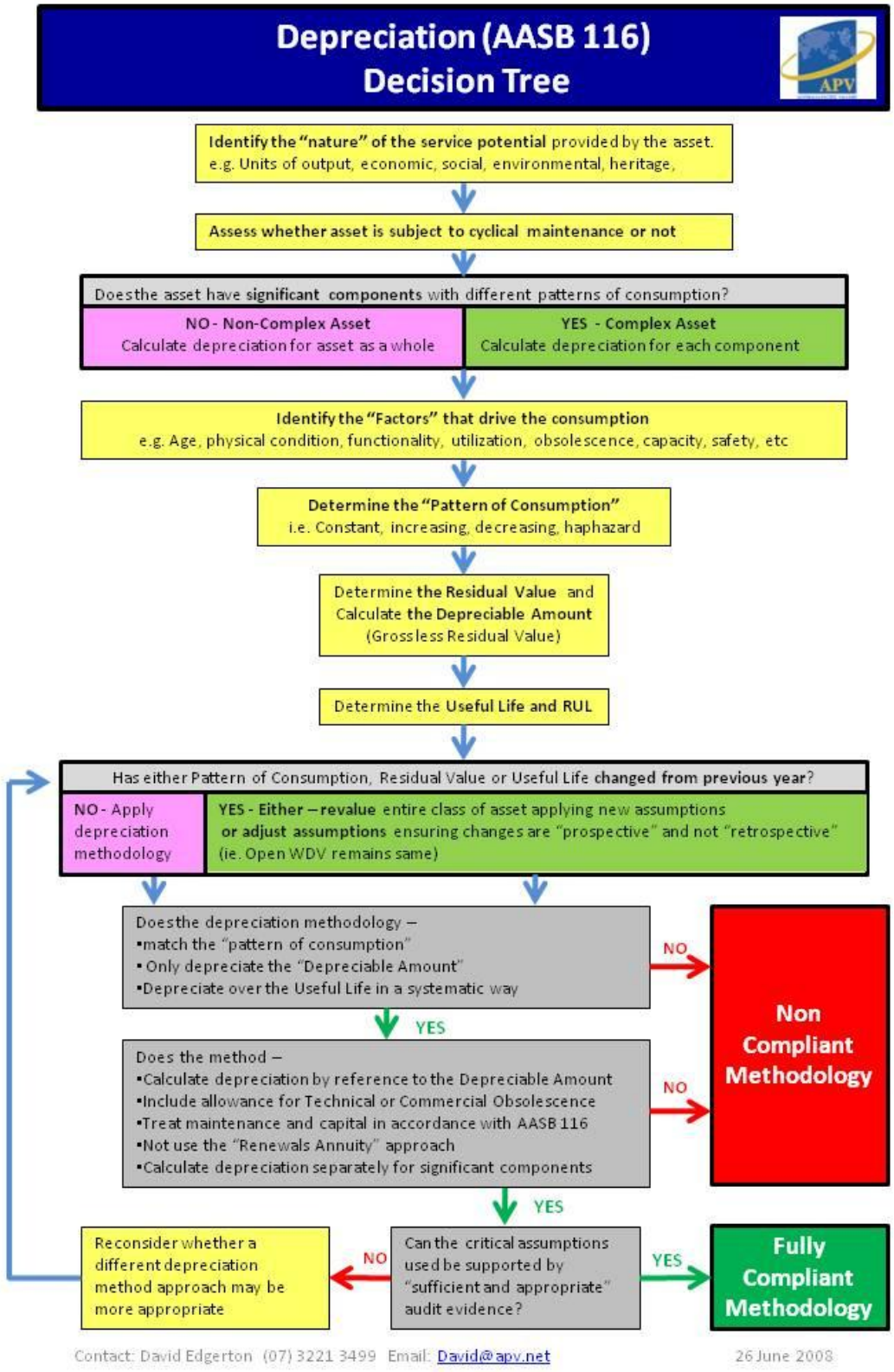
Component	Type (examples only)
Mains	AC, UVC, PVC, Hobas, Cast Iron
Manholes	Standard

Active Assets

(Filtration Plant, Pump Stations, etc)

Component	Type (examples only)
Civil	Standard
Electrical	Standard
Mechanical	Standard

Decision Tree



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[23] APV Valuers and Asset Management (Edgerton) 2008 (www.apv.net/downloads)

Depreciation Calculation Examples

The following examples are provided to demonstrate the practical application of common depreciation methods. There is no "one best" method that should be applied across all assets. To be successful, the method must be cost effective and must "reflect the pattern of consumption" of the asset's service potential so as to enable the users of the financial statements to make sound economic decisions.

Straight-Line Depreciation

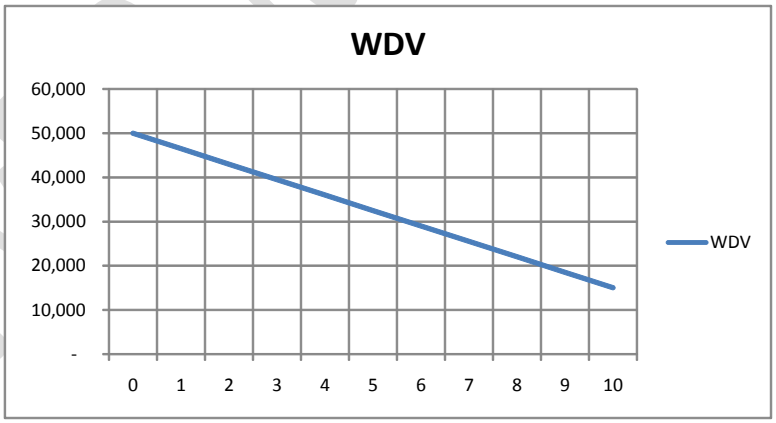
EXAMPLE - STRAIGHT-LINE DEPRECIATION

The cost to Council for a new Road "Seal" is $50,000
At the time of construction, it is estimated that the road will need to be "re-sealed" in 10 years time.
The cost of a "re-seal" is estimated to be $35,000.

Gross = $50,000
RV = $15,000
Useful life = 10 years

Depreciation = (Gross - Residual Value) / Useful Life
(50,000 - 15,000) / 10
$3,500 p.a.

	WDV
0	50,000
1	46,500
2	43,000
3	39,500
4	36,000
5	32,500
6	29,000
7	25,500
8	22,000
9	18,500
10	15,000



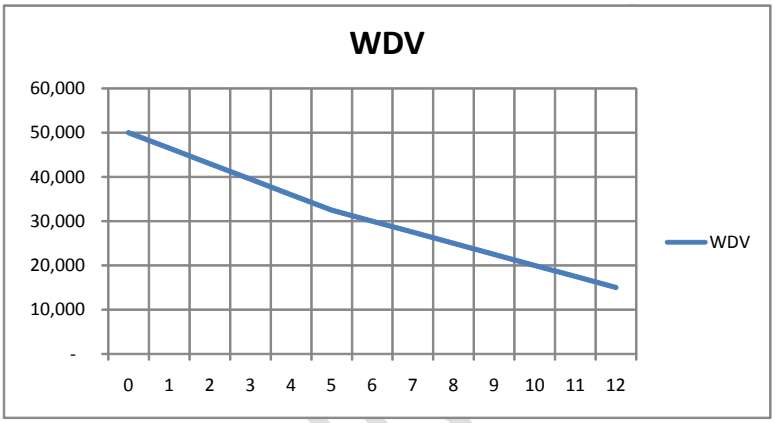
CHANGE IN ASSESSMENT OF REMAINING USEFUL LIFE

After 5 years a "condition assessment" is performed and the Remaining Useful Life (RUL) is now estimated to be - 7 years

At this point the WDV was $32,500. Therefore the depreciation is now calculated as (WDV - RV) / RUL

WDV =	32,500
RV =	15,000
RUL =	7
Depr Exp =	2,500

	WDV
0	50,000
1	46,500
2	43,000
3	39,500
4	36,000
5	32,500
6	30,000
7	27,500
8	25,000
9	22,500
10	20,000
11	17,500
12	15,000



RE-NEWAL AND REASSESSMENT OF REMIANING USEFUL LIFE

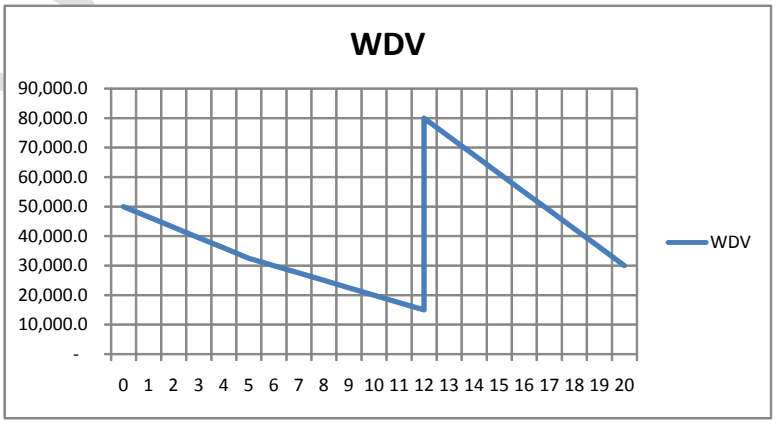
At end year 12 years the road is finally "resealed".

As a consequence, the time to next re-seal is estimated to be 8 years.

The cost to Council for a new Road "Seal" is now estimated at $80,000 and a re-seal at $50,000

Gross Cost =	80000
RV =	30000
RUL =	8
Depr Exp =	6250

	WDV
0	50,000.0
1	46,500.0
2	43,000.0
3	39,500.0
4	36,000.0
5	32,500.0
6	30,000.0
7	27,500.0
8	25,000.0
9	22,500.0
10	20,000.0
11	17,500.0
12	15,000.0
12	80,000.0
13	73,750.0
14	67,500.0
15	61,250.0
16	55,000.0
17	48,750.0
18	42,500.0
19	36,250.0
20	30,000.0



Condition Based Depreciation

EXAMPLE - CONDITION BASED DEPRECIATION

Council has implemented a Pavement Management System
In doing so, it has created a number of algorithms to estimate the RUL of each "seal"
based on various condition scores.

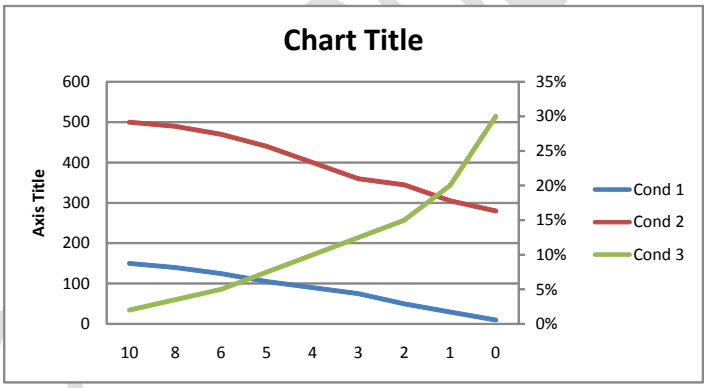
The algorithms for each condition result in the following correlation with estimated RUL
Zero RUL represents total end of life
RUL is assessed on each condition with lowest RUL adopted.

The cost of a "re-seal" is estimated to be $35,000.

Gross Cost =	50,000	
RV =	$ 15,000	
Useful Life =	10	years

CONDITION ALGORTHYM

Years	Condition Scores		
	Cond 1	Cond 2	Cond 3
10	150	500	2%
8	140	490	4%
6	125	470	5%
5	105	440	8%
4	90	400	10%
3	75	360	13%
2	50	345	15%
1	30	305	20%
0	10	280	30%



In year 3 a "condition assessment" was performed. The results were -

	ACTUAL CONDITION		
	Cond 1	Cond 2	Cond 3
	125	440	4%
RUL	6	5	8
Therefore RUL =		**5**	

In turn, this leads to a "revaluation" -

RV =	$ 15,000
Gross =	$ 50,000
Useful Life =	10
RUL =	5

Depreciatic (Gross - RV) / UL
($1m - $0) / 40
$ 5,000

WDV = Gross - ((Useful Life - RUL) * Depreciation)
$1m - ((40 - 25)* $25,000)
$ 25,000

Consumption Based Depreciation

EXAMPLE - CONSUMPTION BASED DEPRECIATION

Council has developed a Consumption Based Depreciation methodology for its infrastructure assets.
As part of this process a Dynamic Matrix was created for assessment of Road "Seal".
The relevant factors identified as relevant to assessing the remaining level of service potential were -

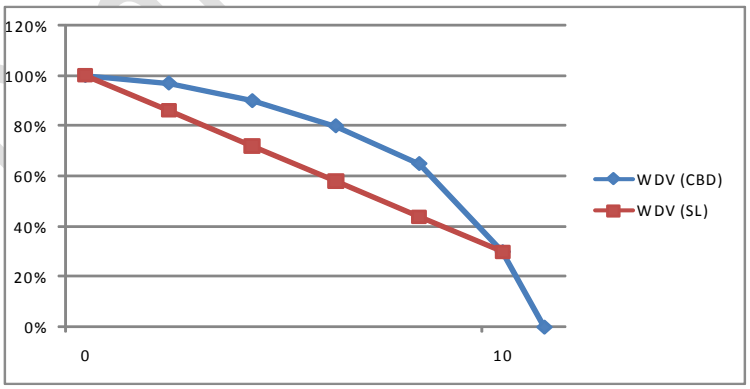
Holistic Level	Component Level
Functionality	Physical Condition (cracking, rutting, oxidization)
Capacity	Breakage
Safety	
Obsolescence	

The following assessment criteria were developed to provide a condition rating -

Phase Points	Description
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. Should be 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.
End of Life	Theoretical end of life

The following lifecycle was also developed for the particular asset -

	Phase						
Details	**0**	**1**	**2**	**3**	**4**	**5**	**6**
% RSP	100%	97%	90%	80%	65%	30%	0%
Min Time	0	0	0	0	0	0	
Max Time	4	4	4	4	4	1	
Avg Time (Rounded)	2	2	2	2	2	1	
Depr Rate	1.50%	3.50%	5.00%	7.50%	17.50%	30.00%	



Based on assessment of the holistic and component specific factors it was assessed that the asset was currently at Phase 1.

The Gross Current Replacement Cost was = $50,000
Based on the Consumption Profile -
WDV = 97% * $50,000 = $48,500 Depreciation = 3.5% * $50,000 $1,750

Renewals Annuity

EXAMPLE - RENEWALS ANNUITY

NOTE - This method is prohibited for financial reporting purposes

The following cash flows are budgeted to enable maintenance of the existing level of service over the next 15 years for a Road Seal

It is also assumed that costs will increase on average by 8% p.a. While inflation will be 5%

Year		8%		5%	
	Cost (curr$)	Price Factor	Proj Cost	Discount	Curr Value
0	-	100%	-	100%	-
1	-	108%	-	95%	-
2	1,000	117%	1,166	90%	1,050
3	1,000	126%	1,260	85%	1,071
4	1,000	136%	1,360	80%	1,088
5	2,000	147%	2,939	75%	2,204
6	2,000	159%	3,174	70%	2,222
7	2,000	171%	3,428	65%	2,228
8	2,000	185%	3,702	60%	2,221
9	5,000	200%	9,995	55%	5,497
10	35,000	216%	75,562	50%	37,781
11	-	233%	-	45%	-
12	-	252%	-	40%	-
13	1,000	272%	2,720	35%	952
14	1,000	294%	2,937	30%	881
15	1,000	317%	3,172	25%	793
	54,000				57,988

Years		15
Average Annualised Cost	$	3,866