MOLONEY SYSTEMS

NOTES ON THE VALUATION

OF ROAD ASSETS

FOR ACCOUNTING PURPOSES

Amended August 2016 to cover the program changes that allow for asset valuation based on age or condition as selected. Further updated June 2017 with sections 1.1 - 1.1.2 to better define 2 important up front decisions.

June 2017

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1.0 Introduction

The purpose of this document is to provide a basic understanding of the asset valuation methodology adopted within the roads module of the Moloney Asset Management System.

The roads module covers the following road sub asset sets.

- Sealed road pavement
- Unsealed road pavement
- Road formation or earthworks
- Sealed surface
- Kerb
- Footpath
- Street furniture.

1.1 Tracking asset valuations with time

There are some important decisions that need to be made in relation to how you wish to track your asset valuations following a condition survey of the assets (sometimes referred to as a revaluation).

1.1.1 Condition or Age based Written Down Value

The starting point for asset valuations is to decide if they are to be based on asset condition or asset age. If based on condition follow through sections 2 - 5. If based on age most of sections 2 - 4 will not apply so Section 6 will cover this method. However, there are some areas that are appropriate to the age based valuations and so it is recommended that you at least scan through sections 2 - 5.

1.1.2 Capital works based on Unit Rates or actual Cash Expenditure

Carrying forward asset valuations for the years between condition inspections also involves a decision as to how you wish to treat the capital works undertake each year. You can either use the Roads module to maintain asset valuations at any time interval that you require. Alternatively you can adopt the valuations following the condition assessment as the valuations as at that date and then track the change in valuations with time through our "Account Between Surveys" File. (See section 5.2 for more details of this method).

The principal difference is that if using the Moloney Asset Management system to track the movement in asset valuations, capital works will go into the system based on the unit renewal rates that are set within the system. While under the "Account Between Surveys" method it is the actual cash expenditure that is used to amend asset valuations. So the "Account Between Surveys" method will reconcile with cash expenditure but capital works going into the system at standard renewal rates will not.

2.0 Road Asset Valuations – The General Approach

This document is aimed at providing a basic understanding of how asset valuations are undertaken within the system and the impact of the various accounting variables available within the system.

There are a number of options built into the roads module that enable the refinement of the basic road asset valuation figures. It is important to understand how they work and how they impact on valuation.

2.1 The Basis of the Valuation Process

In simple terms, assets are valued within the roads module in the following way.

2.1.1 Replacement Value:

Established by applying unit rates of replacement to an asset quantity

2.1.2 Written Down Value:

The current or written down value WDV of the assets is established by factoring back the replacement value based on the asset condition. As at August 2016 there is now an alternative to deliver WDV based on the age of the asset (See Section 6 for more detail).

2.1.3 Annual Depreciation:

Derived by dividing the replacement value by the expected asset service life. Has also been affected by the August 2016 amendments (See Section 6 for more detail).

2.2 Refining the Valuations

There are a number of ways in which the basic valuations can be refined. The roads program has certain features, which impact on the outcome of asset valuation. Broadly the variables that impact on valuation outcome are as detailed below.

1. Two Stage Costing Structure
2. Capacity to carry a residual Value within Pavement and Formation sub assets
3. Ability to distribute the WDV from Full value at Condition 0 to a zero value at any condition from 3 to 10
4. Allowing for additional annual depreciation from the date of the asset condition inspection to date of valuation
5. Allowing annual depreciation to continue even when WDV is zero.

2.2.1 The two Stage Costing Structure

The roads program was originally set up to allow for the running of a dual costing structure for all sub assets. The reason for this relates to the green fields – brown fields dilemma, but can best be explained with the sealed surface asset group where the next proposed treatment is nearly always different to the existing.

The existing seal treatment may be a 14mm initial treatment prime and seal at a cost of $8.00 per square metre, while the proposed next treatment may be a 7mm reseal at a cost of $4.00 per sqm. For accounting purposes it may be necessary to base the valuations on the existing 14mm prime and seal treatment, while for renewal costing and works programs the proposed 7 mm treatment is more appropriate. Hence the two stage costing structure. The “Valuation sheet” within all sub asset file is always based upon the existing treatment cost, while the “Condition Sheet” is based upon the proposed next treatment costs. If there is no next treatment nominated the program uses the existing treatment cost for both.

Similarly for a pavement asset, there may be a 400mm deep original pavement costing $50.00 per sqm. With a replacement or rehabilitation treatment consisting of a 150mm deep pavement overlay at a cost of $25.00 per sqm.

The same two stage costing structure is provided for the kerb assets but it is no longer available for footpaths.

2.2.2 Residual Value:

The concept of residual value was introduced, first for pavement assets in order to reconcile the difference between the valuations of existing and proposed pavement treatments. In the example above the heavy 400mm deep original pavement costing $50.00 per sqm, and the 150mm deep next treatment pavement at a cost of $25.00 per sqm. Will result in very different valuation figures.

But by applying a 50% residual value to the original pavement treatment both the WDV and the annual depreciation will end up the same for both treatments. The 50% residual value has the effect of lifting the written down value (as 50% remains at its full replacement value at the time of rehabilitation). It also decreases annual depreciation as once again only 50% of the asset valuation is depreciated.

Residual value was added to formation assets at a later date in order to better reflect the real depreciation on the assets. Certain accountants and auditors would not permit asset life to rise above 100 years. But formations are simply earthworks, which once in place do not measurably deteriorate. Thus a residual value was introduced to effectively lower the annual depreciation over the maximum 100-year life and better reflect reality.

Residual value for road pavements is recorded as a percentage within column EY of the Master Sheet of the St Data2 file for each individual road segment as required. Residual value for formations is recorded in Column D of the Codes sheet against the individual formation code.

2.2.3 Written Down Value (WDV) adjustments:

The Moloney asset condition scale operates on a 0 to 10 maximum range. With zero an as new or perfect condition asset and 10 one with no remaining value. The original program established the WDV by simply factoring back the replacement value based upon a linear relationship with asset condition. That is zero condition retained full replacement value as the WDV and condition 10 delivered a zero WDV.

It became apparent that this method was overstating the WDV of the assets. Take the example of a kerb in condition 8. Condition 8 for a kerb is the condition at which it is considered the kerb should be replaced, as it is no longer fulfilling its function.

The WDV for a kerb in condition 8, with no other intervention, would be 20% of the replacement value, when in reality it should be zero. To rectify this situation a variable was introduced that set the condition rating at which the WDV would reach zero. This would normally be within the 7 – 10 condition range. For the Kerb example above it would be set at 8 and thus the WDV would scale from 100% in condition 0 to Zero value at condition 8 on a straight-line basis.

The factor is amended within the Codes Sheet of the St Data 2 file at the top of each code table and when used applies to all assets within that sub asset set at the same rate.

2.2.4 Allowing for additional Annual depreciation since the date of the survey

The adopted valuation methodology within the Moloney system was originally set up to provide a snapshot of the asset valuation at a single point in time. That point being the data of the condition survey. Our preferred methodology for accounting for the assets in the years following the condition survey and before the next condition survey is to use our "Account between surveys" file. This file enables the valuation at actual cost to be tracked between the years of the two condition surveys.

But the program does have the capacity to allow for additional annual depreciation for the time after the condition assessment up to a later valuation date. See section 5.1.2 below for more details

2.2.5 Allowing annual depreciation to continue when the WDV is zero

This is really quite a contrary option to normal accounting practice but our software was originally set up so that the maximum asset condition delivered was 9.99 with the condition not able to reach 10.0 and hence in the original calculation of written down value, there was always a small remaining value in order to maintain an annual depreciation figure.

The theory behind this was that a poorly performing council with a large extent of assets fully written down was being rewarded with lower levels of annual depreciation for poor management. We changed the way the software delivered annual depreciation some years ago so that when the WDV was zero so too was annual depreciation. However some councils that were operating with older versions of the software did not want the subsequent change in the annual depreciation figure.

To overcome the problem we introduced a new variable within Cell N2 on the "Run" sheet of the "St-Data2" file. There is a Yes / No option to set Annual Depreciation to zero when WDV equals zero. This variable can have a significant impact of the annual depreciation figure particularly if your WDV is being set to zero at a condition lower than condition 10 (See 2.2.3 above).

2.2.6 Setting Written Down Value based in asset age

In August 2016 the Roads module was amended to allow the WDV or the present worth of the assets to be directly linked to asset age. See section 6 below for more details.

3.0 Road Asset Valuations - Specific

This section will deal more specifically with the actual operations within the roads module.

3.1 The Basic Input information

All original data is input into the “StData2” file. There are 2 sheets within this file that drive the valuations.

The **Master Sheet**: Contains all of the dimensional information sufficient to quantify the assets as well as the codes to identify the asset type and the unit replacement rate and life cycle that is appropriate.

The **Codes** Sheet: Contains lists of all of the valuation codes that are used within the system. Against the codes are placed the user defined unit replacement rates and the expected asset lives.

3.2 The Valuation Process

All valuations are undertaken within the sub asset files and not the St Data2 file. There are 7 sub asset files all with a valuation sheet that delivers asset valuations down to the level required by the user. The sub assets and sub asset files are as detailed below.

- Pave_2 Sealed Road Pavement File
- UsPave_2 Un Sealed Road Pavement File
- Seal_2 Sealed Surface File
- Kerb_2 Kerb File
- Footph_2 Footpath File
- StFurn_2 Street Furniture File
- Trees_2 Street Tree File

Each of the 7 files has a Valuation sheet and that is where the valuations are undertaken. In the example below 6 sealed surface segments are displayed. Figure 1 displays the segmentation and asset quantity details. Note that asset quantity in this case square metres (sqm) can be very accurately determined with three widths, extra various sqm and add and subtract distances off the segment length.

Seg I.D. No.	ROAD OR STREET NAME	SEGMENT DETAIL					Sealed Surface Details						
		FROM		TO		Total	O/A	Sec Wid		Third Wid		Var	Add
		Street Name or Description	Dist. m	Street Name or Description	Dist. m	Length	Wid m	Wid m	Leng m	Wid m	Leng m	sqm	Subt. m
1	Albert St	King St Eos	0	Seal Change	201	201	11.2	8.2	20	6.1	15	200	
142	Freds Rd	Black Bottom Rd	0	Lobbs Rd	1,700	1,726	5.8						26
143	Freds Rd	Lobbs Rd	1,700	Glenbrae Rd	3,660	1,960	5.6						
144	Freds Rd	Glenbrae Rd	3,660	Seal Change	4,290	630	5.6						
145	Freds Rd	Seal Change	4,290	Loaders Rd	5,260	970	6.2						
146	Freds Rd	Loaders Rd	5,260	Gordons Rd	6,550	1,290	6.8						

Figure 1 – Segmentation and asset quantity details

Figure 2 relates to the same 6 segments and details the Condition information as well as the existing and proposed asset treatments. The program condition in Figure 2 is delivered via a consideration of the 7 individual condition-rating factors. It is a condition rating on a 0 – 10 scale with 0 being new and having full remaining value and 10 being the worst condition possible.

Seg I.D. No.										Treatments		
	Prog Cond 0-10	Ck Ex 0-5	Ck Se 0-5	St St 0-5	Bit Ox 0-5	Pat 0-5	Tex 0-5	Edg Brk 0-5	Seal Area	Exist Code	Prop Code	Date of Insp.
1	**2.73**	0	0	1	**2.0**	1	1	0	2,315	AS	R10	Oct-11
142	**1.82**	1	3	1	**0.5**	1	3	1	10,011	R10	R7	Oct-11
143	**4.40**	1	3	1	**2.5**	2	3	2	10,976	R10	R7	Oct-11
144	**4.40**	1	3	1	**2.5**	2	3	2	3,528	R10	R7	Oct-11
145	**6.06**	1	3	1	**4.0**	1	3	2	6,014	R7	R10	Oct-11
146	**4.85**	1	3	1	**3.0**	1	3	0	8,772	PS7	FS10	Oct-11

Figure 2 – Condition and treatment details

Seg I.D. No.	Seal Valuations				
	Seal Area sqm	Replace Value $	Asset Life Years	Written Down Value	Annual Dep
1	2,315	46,294	30	28,268	1,543
142	10,011	38,041	17	28,135	2,238
143	10,976	41,709	17	15,510	2,453
144	3,528	13,406	17	4,985	789
145	6,014	21,049	15	2,819	1,403
146	8,772	30,702	15	9,424	2,047

Figure 3 – Sealed Surface Valuations

The sealed surface valuations in figure 3 above are derived as follows.

Seal Area: Calculated from the segment dimensions in figure 1

Replacement Value: Seal area multiplied by $20.00 (the unit rate value for asphalt) see figure 4 below

Written Down Value: The replacement value factored back based on asset condition See Note below

Annual Depreciation: Replacement value divided by the service life for the asset as detailed in the code table in figure 3 below

Condition to Zero Value		7.00	
CODE	SEALED SURFACE CODE DESCRIPTION	VALUATION $ per sqm $ / sqm	Seal Life Years
AS	Asphalt unknown depth	20.00	30
FS10	Final Seal Size 10 mm	4.00	17
PS7	Primer Seal 7 mm - Costed with Pavement	3.50	15
R10	10mm RESEAL	3.80	17
R14	14mm RESEAL	4.00	18
R7	7mm RESEAL	3.50	15

Figure 4 – The code Tables

Figure 4 is the code table for the sealed surface assets. For example the “AS” code relates to an asphalt surface with a replacement value of $20.00 per sqm and a service life of 30 years. There is one other important figure within the table. The condition to zero value field at the top of the table (in this case 7). This figure is used to determine the zero asset value point within the 0 – 10 condition scale.

In this case the WDV will equal zero when the asset condition reached 7.0. For asset segment No 1 above, the condition is 2.73 and so the WDV at $28,268 is derived by factoring back the replacement value of $46,294 on a linear condition scale of 0 – 7.0. At Condition 2.73 some 39% of the asset valuation has been consumed. If running down the value to zero at condition 10 then only 27.3% of the value would have been consumed.

The valuations will not reconcile exactly with calculations because of the 2 decimal place display for some figures. The program does however operate to more decimal places than are displayed.

3.3 Valuations for other sub assets

The process described above is common to all 7 sub asset files. The fields that calculate the asset quantity and condition may be different but the theory is exactly the same for all.

When each sub asset file is run from the Run Sheet of the St Data2 file the overall valuation results are brought back to the Run sheet as illustrated in Figure 5 below.

Table No.R2 — **Date of Asset Valuation *AS AT* 06/30/16**

ASSET DESCRIPTION	Total Quantity	Units	Total Quantity	Units	Weighted Av. Asset Cond.	Replace. Value $	Asset Life in Years	Written Down Value $	Accumul. Deprec. $	Annual Deprec. $	Annual Liability Cost	Sub Asset File Last Updated on	Average Date of Cond. Assessment	Additional Accum. Dep Since Insp.
Footpath	18,659	Lin. Met	33,816	sqm	3.383	$1,960,791	52.1	$993,001	$967,790	$37,007	$37,007	20-Jun-16	15-Dec-15	$20,061
Kerb	59,447	Lin. Met			3.200	$5,451,399	78.1	$3,232,571	$2,218,828	$70,420	$70,420	20-Jun-16	15-Dec-15	$38,174
Sealed Pavements	738,455	Lin. Met	4,729,413	sqm	3.848	$106,448,891	83.9	$54,457,945	$51,990,946	$1,456,474	$1,456,474	20-Jun-16	15-Dec-15	$789,547
Unsealed Pavement	1,228,026	Lin Met	4,630,178	sqm	1.288	$20,008,689	34.5	$16,283,834	$3,724,854	$651,083	$651,083	20-Jun-16	6-Sep-15	$352,948
Sealed Surface	739,190	Lin. Met	4,038,213	sqm	3.744	$18,998,688	20.4	$8,358,337	$10,640,351	$928,519	$884,693	20-Jun-16	15-Dec-15	$496,748
Sealed Rd Formation	738,455	Lin. Met	5,595,500	sqm	0.000	$31,553,784	100.0	$31,545,226	$8,558	$15,777		20-Jun-16	15-Dec-15	$8,558
U/S Rd Formation	1,310,451	Lin. Met	6,300,533	sqm	0.000	$21,675,705	100.0	$21,666,731	$6,974	$10,838		20-Jun-16	6-Sep-15	$6,974
Street Furniture		No										10-Jun-15	1-Aug-14	
TOTAL VALUATIONS						$206,097,947		$136,539,645	$69,558,302	$3,170,118	$3,099,677			$1,713,011

Figure 5 – Overall Valuations in Run Sheet of St Data2 File

3.4 Refinements to Asset Valuations

In section 2.2 five refinements to the basic asset valuation methodology were outlined. Here the application and affect will be expanded. The five refinements are:

1. Two Stage Costing Structure
2. Capacity to carry a residual Value within Pavement and Formation valuations
3. Ability to distribute the WDV from Full value at Condition 0 to a zero value at any condition within the range 3 to 10
4. Allowing for additional annual depreciation from the date of the survey to date of valuation
5. Allowing annual depreciation to continue even when WDV is zero.

The third item above has been dealt with in the explanation for the WDV – End condition value explanation in the section immediately below figure 4 above.

3.4.1 The two stage costing structure

For accounting purposes valuations often need to be based on the cost of the existing treatment while for engineering purposes the cost of the next proposed treatment is far more meaningful. For all assets other than Street furniture and Footpaths there is the capacity within the system to define a code for the existing treatment and a code for the next proposed treatment.

In addition to this, the quantity of the proposed next treatment can also be amended. In this way accounting requirements can be met as well as the engineering requirements to cost the next proposed treatment in an accurate way.

In section 3.2 above asset ID no 1 was made up of an existing asphalt surface with a unit Renewal cost or valuation of $20.00 per sqm. The next proposed treatment was a reseal sized 10 mm (R10) with a renewal cost of $3.80 per sqm. Hence the valuation sheet valued the asset at $46,294 but the Condition sheet valued the rehabilitation or reseal cost at $8,796.

This is an extreme example but it is real and it does demonstrate the need for the two stage costing structure. All sub asset files have a valuation sheet and a condition sheet. The valuation sheet is always based on the value of the asset presently in place. The condition sheet can generally be based on the next proposed treatment. If a next treatment is not present in the data set then the program assumes that the next treatment will be the same as the existing and calculates accordingly.

Within the data set in Figure 5 above the only sub asset set that had different codes for the existing and proposed treatments (to use the 2 stage costing structure) was the sealed surfaces and hence the annual depreciation and annual liability for these assets is different and is the same for the others.

The term Annual Liability is used within the Moloney AMS to denote the estimated ongoing annual cost to renew the asset and is really the same as Annual Depreciation accept that the unit rate used is that for the next proposed treatment.

3.4.2 Residual Value – Valuation Variations

In an effort to align what we call annual liability with the annual depreciation coming out of the valuation system, we introduced the concept of a residual value. At first this covered only pavements and then formations were added at a later date. Annual liability we see as the real future cost of ongoing asset ownership. Unfortunately in some states we are saddled with the annual depreciation figure being linked to a green fields construction cost which in reality delivers a meaningless figure that has no relationship to future ongoing demand.

This is why it was necessary to create a 2 stage costing structure, with the residual value then created in order to bring the annual depreciation and annual liability closer together in certain situations. In simple terms the residual value operates in the following way:

- A new rural sealed road pavement is put down with a 400 mm deep granular pavement at a unit rate of $40.00 per sqm.
- When the pavement is no longer serviceable and requires rehabilitation, this can be achieved with a 150 mm deep granular overlay at a unit cost of $20.00 per sqm.
- With the retreatment costing only 50% of the cost of the original construction there is in effect a 50% residual value within the original pavement at the time of reconstruction because the retreatment brought the asset back to as new condition.
- By applying the 50% residual value annual depreciation is halved and the minimum WDV will equal 50% of the original construction cost when the asset reaches its end condition point.
- In this way the annual liability and the annual depreciation can be brought closer together and the valuations within the account system far better reflect the real situation.

The reverse situation can also occur. For example, on an urban road with an original green fields pavement construction cost of $40.00 per sqm the renewal cost may be $80.00 per sqm (because of the need to cart the old one away and provide for traffic etc. during construction). In this case a residual value won't help and annual depreciation will be only 50% of the annual ongoing liability to renew the asset.

In this reverse situation the software can make accurate predictions of annual liability via the two stage costing structure but we cannot align annual depreciation and annual liability.

Green fields construction costing for Local Government road assets is a real problem and tends to understate the annual depreciation figure. The two stage costing structure within the software can be used to overcome the problem in relation to the costing of works programs and future financial modelling. But the under reporting of annual depreciation compared to the real figure of annual liability is a serious ongoing problem that needs to be addressed at an industry level.

3.4.3 WDV Adjustment to a condition less than 10

The refinement is the adjustment of the WDV to a zero value at an asset condition that is less than 10. Within the Codes sheet for all of the road sub assets the capacity has been given to vary the point at which the WDV arrives at zero.

While the Moloney condition rating scale runs from 0 – 10 for many asset types it would be impossible for the asset to remain in service up to condition 10. Hence a variable was created that enables the WDV to run down to zero at a nominated condition that is lower than condition 10.

For example, a road pavement at condition 8 may be considered to be in a condition that required reconstruction right now. Thus its real WDV is zero. The program has been given the flexibility to allow for this reduced service condition and to accordingly spread the WDV out between condition zero and the adopted end point condition.

Figure 6 below illustrates the % of total asset life (value) remaining for 4 different situations with zero value occurring at condition 7 red, 8 black, 9 blue and finally 10 green. As can be seen the termination of the full asset value prior to condition 10 does have a big impact on the WDV right through the whole condition range.

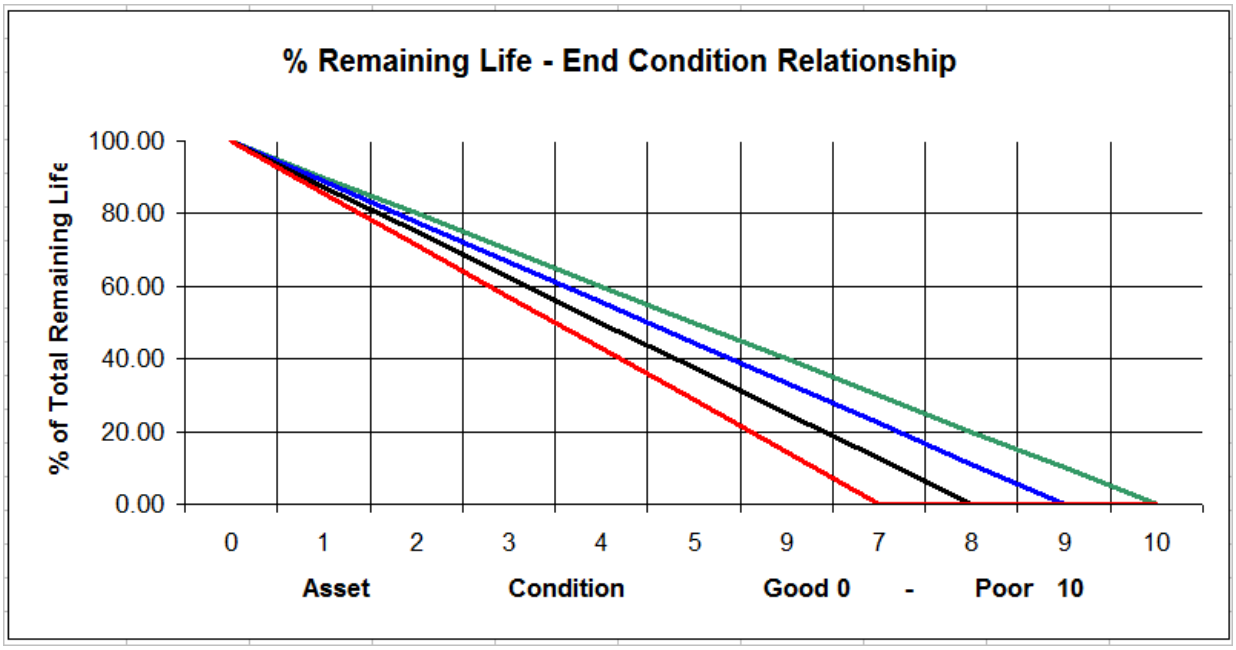


Figure 6 – % of Remaining asset life to different condition end points

3.4.4 Allowing for annual depreciation from the date of the survey to a later date.

The adopted valuation methodology within the Moloney system was originally set up to provide a snapshot of the asset valuation at a single point in time. That point being the data of the condition survey. Our preferred methodology for accounting for the assets in the years following the condition survey and before the next condition survey is to use our "Account between surveys" file (see 5.5.1 below). This file enables at cost reconciliation between asset valuations and capital expenditure.

If you are using the roads module as a live means of delivering asset valuations and not using the "Account Between Surveys" file, then you would adopt a "Yes" for this option in cell L2 as well as providing a valuation date in Cell J2 of the "Run" Sheet of the "St-Data2" file (see figure 7 below). You would also need to be sure that all capital works activities since the time of the survey had been fully updated into the system as well.

Table R1 Prog. Run Options	Last Update	Reports to be Run Place a "Y" in Column "I" against the Report options that you want to run		Valuation Date 30/06/2016 Description of options 1 - 9 in Column I	Adj. WDV for Time since Insp. Yes	Set Ann Dep to 0 if WDV = 0 Yes
1		Run Road Register Reports	n	Runs The two Road Register Report Sheets		
2	20-Jun-16	Footpath Sub Assets	Y	Runs Footpath Sub Asset File & Updates overall Figures on This Sheet.		
3	20-Jun-16	Kerb Sub Assets	Y	Runs Kerb Sub Asset File & Updates overall Figures on This Sheet.		
4	20-Jun-16	Sealed Pavement Sub Assets	Y	Runs Sealed Pavement Sub Asset File & Updates overall Figures on This Sheet.		
5	20-Jun-16	Un-Sealed Pavement Sub Ass.	Y	Runs Un Sealed Pavement Sub Asset File & Updates overall Figures on This Sheet.		
6	20-Jun-16	Sealed Surface Sub Assets	Y	Runs Sealed Surfaces Sub Asset File & Updates overall Figures on This Sheet.		
7	10-Jun-15	Street Furniture Sub Assets	n	Runs Street Furniture Sub Asset File & Updates overall Figures on This Sheet.		
8		Street Tree Sub Assets	n	Runs Street Tree Sub Asset File & Updates overall Figures on This Sheet.		
9		Run Class Valuation Reports	n	Updates the "Class Valuation" Sheet		

Figure 7 Adjust for WDV since the time of the survey

With the new valuation date recorded within Cell J2 and the sub asset filed that you want run marked with a "Y" in cells I5 - I11. The sub asset files are updated from the "Roads" menu as detailed below.

"Roads / 2. Run Sheet - Update sub asset files / Run all sub asset files nominated with "Y" in Table R1

This operation will first update the sub asset files and then bring back the overall valuation figures to Table R2 on the "Run" sheet. Note that table R2 also records as a separate figure the additional annual depreciation that was added to the WDV that was current at the time of the survey. In this case the date of the condition survey was 15/12/2015 and the required valuation date in figure 7 above was 30/6/2016. Hence there is just over half a years worth of additional annual depreciation added to the WDV as recorded in the lat column.

Table No.R2 — **Date of Asset Valuation *AS AT* 06/30/16**

ASSET DESCRIPTION	Total Quantity	Units	Total Quantity	Units	Weighted Av. Asset Cond.	Replace. Value $	Asset Life in Years	Written Down Value $	Accumul. Deprec. $	Annual Deprec. $	Annual Liability Cost	Sub Asset File Last Updated on	Average Date of Cond. Assessment	Additional Accum. Dep Since Insp.
Footpath	18,659	Lin. Met	33,816	sqm	3.383	$1,960,791	52.1	$993,001	$967,790	$37,007	$37,007	20-Jun-16	15-Dec-15	$20,061
Kerb	59,447	Lin. Met			3.200	$5,451,399	78.1	$3,232,571	$2,218,828	$70,420	$70,420	20-Jun-16	15-Dec-15	$38,174
Sealed Pavements	738,455	Lin. Met	4,729,413	sqm	3.848	$106,448,891	83.9	$54,457,945	$51,990,946	$1,456,474	$1,456,474	20-Jun-16	15-Dec-15	$789,547
Unsealed Pavement	1,228,026	Lin Met	4,630,178	sqm	1.288	$20,008,689	34.5	$16,283,834	$3,724,854	$651,083	$651,083	20-Jun-16	6-Sep-15	$352,948
Sealed Surface	739,190	Lin. Met	4,038,213	sqm	3.744	$18,998,688	20.4	$8,358,337	$10,640,351	$928,519	$884,693	20-Jun-16	15-Dec-15	$496,748
Sealed Rd Formation	738,455	Lin. Met	5,595,500	sqm	0.000	$31,553,784	100.0	$31,545,226	$8,558	$15,777		20-Jun-16	15-Dec-15	$8,558
U/S Rd Formation	1,310,451	Lin. Met	6,300,533	sqm	0.000	$21,675,705	100.0	$21,668,731	$6,974	$10,838		20-Jun-16	6-Sep-15	$6,974
Street Furniture		No										10-Jun-15	1-Aug-14	
TOTAL VALUATIONS						$206,097,947		$136,539,645	$69,558,302	$3,170,118	$3,099,677			$1,713,011

Figure 8 Overall Valuation Table on Run Sheet of St-Data2 file

If No had been nominated in Cell L2 of figure 7 above and the program run then the last column in figure 8 above would be zero and the WDV would be as of the date of inspection of the assets.

NOTE: This is the basis of the valuation method as outlined in 5.1.2 below.

3.4.5 Allowing annual depreciation to continue even when WDV is zero.

This is really quite a contrary option to normal accounting practice but our software was originally set up so that the maximum asset condition delivered was 9.99 with the condition not able to reach 10.0 and hence in the original calculation of written down value, there was always a small remaining value in order to maintain an annual depreciation figure.

The theory behind this was that a poorly performing council with a large extent of assets fully written down was being rewarded with lower levels of annual depreciation for poor management. We changed the way the software delivered annual depreciation some years ago so that when the WDV was zero so too was annual depreciation. However some councils that were operating with older versions of the software did not want the subsequent change in the annual depreciation figure.

To overcome the problem we introduced a new variable within Cell N2 on the "Run" sheet of the "St-Data2" file. There is a "Yes / No" option to set Annual Depreciation to zero when WDV equals zero. This variable can have a significant impact of the annual depreciation figure particularly if your WDV is being set to zero at a condition lower than condition 10 (See 2.2.3 above). See also figure 7 above for where to activate the option.

3.5 Straight line degradation of WDV

We are sometimes asked if we can produce a WDV based on the actual shape of decay curve instead of a straight line. The answer to this question is yes. But the point of doing it is questioned. We have produced many degradation curves over the last 21 years for road assets and we could adopt an average curve to deliver the WDV. Or we could create a user definable algorithm.

Having undertaken some sample valuations for several councils based on straight-line verses an actual degradation curve, the difference in asset valuation was found to be less than 3%. If you examine the spread of assets over the whole of the condition range than it becomes obvious that what you loose at one end where real degradation may out strip the straight lie you gain at the other where the reverse is true.

It was ultimately decided that it simply was not worthwhile trying to use an actual degradation curve because the difference in valuation outcome was immaterial.

4.0 Checklist for Variable data relating to Asset Valuations

When establishing asset valuations there are a number of matters that must be checked to ensure that the figures accurately reflect the true valuation of the assets. This checklist is provided as a means of ensuring that the variables that impact on asset valuation have been checked and considered.

1. Is the data set within the St-Data2.xls file the correct data set?
2. It is recommended that you copy the program files that you are going to work on to a temporary folder so that you do not loose or amend any of the starting data.
3. Is the date of inspection of the assets present and correct
4. Have the unit rates and life cycle values within the “Codes Sheet” of the St-Data2.xls file been checked and re-assessed.
5. Have you validated your data set with the built in data validation program and fixed any errors
6. Are you using the two stage cost structure and have you set the correct codes in each case
7. Do you wish to use a residual value for the pavement and Formation assets and if so has it been applied correctly in all cases. If not using a residual value be sure to check that there is none present in the Master Sheet.
8. Have you set the upper condition range in relation to the development of WDV on row 8 of the Codes sheet (the point at which the asset value reaches zero)
9. Have you decided upon the basic valuation methodology. "Account between surveys" file or live valuations within the Asset Management System and have you filled in cells J2 and L2 on the "Run" sheet accordingly.
10. Do you want annual depreciation to be set to zero when the WDV is zero and have you set Cell N2 on the "Run" Sheet accordingly.
11. Run the valuation update program when satisfied with all of the above from the Run Sheet of the StData2 file
12. Compare the valuation figures from the last reporting period and be satisfied with any variance.

4.1 Correct Data Set

Be sure that you are using the correct data set for the valuation purpose. This may not always be the most current data set. And check broadly that the overall asset quantities are around the expected level. This can be done from Table 2 of the “Run Sheet” within the St-Data2.xls File

4.2 Create a temporary-working folder

If you end up with substantial changes to the asset valuations from the original data due to corrections and updates that you make, it would be useful to have the old files as a reference until you are happy with the new valuations and can explain the differences.

4.3 Asset Inspection Date

The date of inspection for each element within all of the sub asset groups should be recorded within the “Master Sheet” of the St-Data2.xls File. Check the dates within the data set within Columns AO, BR, DN, FI and GP as appropriate and satisfy yourself that you are dealing with the data set that was inspected at the time you require the valuations. This becomes even more important if you use the facility to calculate depreciation since the last survey for future asset valuations.

4.4 Unit rates and Life Cycles

One of the most important areas in the delivery of asset valuations relates to the figures contained within the “Codes Sheet” of the St-Data2.xls file. Listed against each code within the first 7 tables (C1 to C7) of the sheet you will find the unit replacement values and the depreciation life cycles along with the reference to the date and person who last set the figures.

It cannot be emphasised enough, just how important these figures are, as they really drive the valuation process. You should as a matter of course also have documents at hand supporting both the choice of unit rates and life cycles.

Check that the figures are correct and that you have the supporting documentation. A Note in your “User Defined Notes Sheet” referring to the location of the supporting evidence would be a good idea.

4.5 Data Validation

The Moloney system has a very extensive data validation system that checks all data on the “Master Sheet”. Before running the program to produce asset valuations it would be advisable to validate all data and attend to the recorded problems.

The data validation program is accessed off the “Roads” Menu within the St-Data2.xls file.

Errors are recorded on the “Invalid Entries Sheet” and there is a colour code provided at the top of the sheet to indicate the degree of importance of the errors. You must fix the Red column errors and should fix the Yellow. While the Blue tend to be information fields that wont affect valuation outcome.

5.0 Carrying asset valuations forward to future years

This section primarily relates to asset valuations based on asset condition. The "Accounts Between Surveys" methodology could be employed in conjunction with age based valuations but it would represent a most unlikely combination. The Moloney Roads module was originally designed to deliver a single valuation snapshot at a particular point in time. That is, a condition survey was undertaken, unit rates were applied and the program run, with the following outcome for that single point in time.

Replacement value established –	Asset quantity by unit rate
Written Down Value established -	Replacement value factored back based on asset condition
Annual Depreciation Established -	Replacement Value divided by asset life.

This valuation snapshot was then archived and a file called “Account Between Surveys” was established to manage the asset valuations at a whole of asset set level until the time of the next condition inspection – Revaluation.

The advantage of this methodology is that for the years between the two condition surveys the asset valuations changes can be reconciled back to the actual capital expenditure levels within the accounts.

5.1 Two Methods of Undertaking valuations between condition surveys.

Some Council’s preferred to maintain an active and up to date road AMS that delivered asset valuations directly from the system each year. This is fine but it MUST be understood that this method will NEVER reconcile with cash expenditure.

At the heart of the problem is the way in which asset valuations are delivered within the system. Here unit rates are applied to an asset quantity to deliver a replacement value. A new construction project may have cost $100,000 in cash to construct. But when entered into the asset management system based on a unit rates basis, may deliver a valuation of only $80,000, if the project had a higher than average construction cost. It may deliver $120,000 of value in the system if the project was simple and construction cost lower than average

Thus if cash reconciliation is required for the years between the major condition assessments then the asset management system cannot be used to deliver ongoing asset valuations annually.

There is a choice to be made following a condition survey as to which of the two possible paths you wish to follow. The two paths are broadly as detailed below.

5.1.1 Cash Reconciliation method – Account Between Surveys File:

Following a condition survey of the assets that delivers an up to date set of asset valuations on a given date for:

- Replacement Value
- Written Down Value WDV
- Annual Depreciation

Asset valuations for future years are carried forward within the “Account Between Surveys” file which starts with the snapshot of the above three valuation figures for each sub asset class and then enables the following.

- The Cash value of future asset upgrades are accounted for
- The Cash value of future asset renewals are accounted for
- Annual depreciation is accounted for
- Indexation of asset valuation is accounted for
- Valuations can be obtained for any time on from the time of the original survey
- The movement in asset valuation will always reconcile with cash expenditure

When the next full condition survey is undertaken a book reconciliation will need to be undertaken to bring the new valuations coming out of the asset management system in line with the ones in the accounting system that have been carried forward in the “Account Between Surveys File.

This method has the strong advantage of forcing you to examine the adopted asset lives. If for example the new WDV was much less than the figure coming out of the second survey then your adopted asset lives were clearly too long (annual depreciation too low) and the reverse would also be true.

See Section 5.2 below for more details on the use of the account between surveys file.

5.1.2 Unit Rate Method – AMS Updated Annually:

Within this method the asset management system is used as the ongoing tool to deliver asset valuations annually. It must be understood that the valuations will not reconcile with cash expenditure because the added and rehabilitated assets will be valued at the unit rates that are in the system and not the cash expenditure.

Effectively the following broad process is adopted.

- Survey of assets delivers the 3 critical valuation figures for each sub asset set inspected Replacement WDV and Annual Depreciation at the time of the first survey.
- All new additions and rehabilitation projects MUST be entered into the AMS prior to any revaluation
- The dates of inspection and dates of asset creation for new assets must be entered into the AMS
- Unit rates and life cycles must be reviewed prior to any revaluation date
- Valuation date and adjusted WDV with time is entered into Table R1 on the "Run" sheet of the "St-Data2" file
- The AMS undertakes the revaluation to the selected date and takes from the WDV an appropriate amount corresponding to the annual depreciation since the date of inspection.

Table R1 Prog. Run Options	Last Update	Reports to be Run Place a "Y" in Column "I" against the Report options that you want to run		Valuation Date 30/06/2016 Description of options 1 - 9 in Column I	Adj. WDV for Time since Insp. Yes	Set Ann Dep to 0 if WDV = 0 Yes
1		Run Road Register Reports	n	Runs The two Road Register Report Sheets		
2	20-Jun-16	Footpath Sub Assets	Y	Runs Footpath Sub Asset File & Updates overall Figures on This Sheet.		
3	20-Jun-16	Kerb Sub Assets	Y	Runs Kerb Sub Asset File & Updates overall Figures on This Sheet.		
4	20-Jun-16	Sealed Pavement Sub Assets	Y	Runs Sealed Pavement Sub Asset File & Updates overall Figures on This Sheet.		
5	20-Jun-16	Un-Sealed Pavement Sub Ass.	Y	Runs Un Sealed Pavement Sub Asset File & Updates overall Figures on This Sheet.		
6	20-Jun-16	Sealed Surface Sub Assets	Y	Runs Sealed Surfaces Sub Asset File & Updates overall Figures on This Sheet.		
7	10-Jun-15	Street Furniture Sub Assets	n	Runs Street Furniture Sub Asset File & Updates overall Figures on This Sheet.		
8		Street Tree Sub Assets	n	Runs Street Tree Sub Asset File & Updates overall Figures on This Sheet.		
9		Run Class Valuation Reports	n	Updates the "Class Valuation" Sheet		

Figure 9 – Part of the RUN Sheet Control Panel

The control panel within the Run sheet of the St-Data2 file as illustrated in figure 9 above allows you to update each of the 7 road sun assets together or individually and also enables you to set a desired valuation date in Cell J2 (set here as 30/6/2016). Then within Cell L2 you choose Yes to allow for the additional annual depreciation to be taken from the calculated value of the WDV based on the elapsed time since the survey.

Within the sub asset files where the valuations are undertaken if you choose this path then the program works out the WDV at the time of the survey based upon the asset condition then it reduces the WDV based on the appropriate annual depreciation rate since the time of the last survey. Remember that all capital works since the last survey MUST also be updated into the system along with their date of construction.

Table No.R2 — Date of Asset Valuation *AS AT* 06/30/16

ASSET DESCRIPTION	Total Quantity	Units	Total Quantity	Units	Weighted Av. Asset Cond.	Replace. Value $	Asset Life in Years	Written Down Value $	Accumul. Deprec. $	Annual Deprec. $	Annual Liability Cost	Sub Asset File Last Updated on	Average Date of Cond. Assessment	Additional Accum. Dep Since Insp.
Footpath	18,659	Lin. Met	33,816	sqm	3.383	$1,960,791	52.1	$993,001	$967,790	$37,007	$37,007	20-Jun-16	15-Dec-15	$20,061
Kerb	59,447	Lin. Met			3.200	$5,451,399	78.1	$3,232,571	$2,218,828	$70,420	$70,420	20-Jun-16	15-Dec-15	$38,174
Sealed Pavements	738,455	Lin. Met	4,729,413	sqm	3.848	$106,448,891	83.9	$54,457,945	$51,990,946	$1,456,474	$1,456,474	20-Jun-16	15-Dec-15	$789,547
Unsealed Pavement	1,228,026	Lin Met	4,630,178	sqm	1.288	$20,008,689	34.5	$16,283,834	$3,724,854	$651,083	$651,083	20-Jun-16	6-Sep-15	$352,948
Sealed Surface	739,190	Lin. Met	4,038,213	sqm	3.744	$18,998,688	20.4	$8,358,337	$10,640,351	$928,519	$884,693	20-Jun-16	15-Dec-15	$496,748
Sealed Rd Formation	738,455	Lin. Met	5,595,500	sqm	0.000	$31,553,784	100.0	$31,545,226	$8,558	$15,777		20-Jun-16	15-Dec-15	$8,558
U/S Rd Formation	1,310,451	Lin. Met	6,300,533	sqm	0.000	$21,675,705	100.0	$21,668,731	$6,974	$10,838		20-Jun-16	6-Sep-15	$6,974
Street Furniture		No										10-Jun-15	1-Aug-14	
TOTAL VALUATIONS						$206,097,947		$136,539,645	$69,558,302	$3,170,118	$3,099,677			$1,713,011

Figure 10 – The RUN Valuation Table

Note that within the RUN sheet valuation table above an additional $789,547 has been taken from the WDV of the Sealed Pavement assets because of the time between the condition survey on 15/12/2016 and the required valuation date of 30/6/2016. The WDV was evaluated based on the asset condition on 1/10/2015 at an individual segment level (not all segments need to be assessed at the same time they can have different assessment dates). Then for the time between the survey date and the required valuation date the amount of annual depreciation is taken from the WDV.

To prevent confusion and to assist in tracking the valuations the total amount of additional accumulated depreciation for each asset class since the time of the last survey is recorded in the last column of the table.

Special care MUST be taken if adopting this method part way through the asset inspection cycle. For example if a survey was undertaken in June 2010 and you did not allow for the annual depreciation component to be taken off within the WDV in the June 2011 accounts then updating the software to June 2012 and accounting for the drop in WDV since 2010 will result in 2 full years of annual depreciation coming off the WDV in June 2012.

This method has the advantage of forcing you to keep the AMS up to date at least annually when the annual revaluation is required. If you can operate with the understanding that it will not reconcile with cash expenditure then it

is a good way of maintaining the AMS in an up to date way. It also tends to avoid big reconciliation's with cash expenditure as the adjustments are annual rather than on a 3 – 5 year basis.

5.1.3 Choosing the method of Asset Valuations between condition Surveys.

There are two quite different valuation paths available following an asset condition assessment. The choice of which path to go down really rests with the accounting section of the council and what they are most comfortable with. It may also be a good idea to discuss the options with the auditors.

Assets placed into an AMS that are valued on a unit rate basis will never reconcile with actual cash expenditure. It thus comes down to your preference for an annual small adjustment combined with the updating of the AMS annually. Or the carrying forward of a separate "Account Between Surveys" file that allows for cash reconciliation for the years between major surveys, followed by a book reconciliation to bring the two valuation streams together.

We make no strong recommendations but do have a preference for the "Account Between Surveys" method as it will reconcile with cash over the years between the major condition surveys and will also force a review of asset lives when book reconciliation becomes necessary following the second and subsequent condition surveys.

5.2 The Account Between Surveys Method – Detailed Approach

This explanation applies to all sub asset groups but only one will be followed through here. The accounting valuations for infrastructure assets such as roads are established within the Moloney system in the following way.

Replacement value: - is derived by applying unit rate values to a measured asset quantity.

Present or written down value: - is established by factoring back the replacement value according to the assessed condition of the asset.

Annual depreciation: - is derived by dividing the replacement value by the expected asset life.

This method is used when you wish to have reconciliation with your cash expenditure for all of the years between the condition assessment (revaluation) of the assets on a 3 – 6 year cycle.

5.2.1 The Overall Methodology

- Undertake a field survey of all or any one of the road sub asset groups and use the AMS to establish the accounting figure for Replacement Value, WD Value and Annual Depreciation for the whole asset group.
- Archive a full copy of the AMS details that delivered the above values in a read only format, as this will be needed for audit purposes as the commencing point for the asset valuations.
- Enter into the "Account Between Surveys" File the Commencing valuation figures following the condition survey.
- Enter into the "Account Between Surveys" File the annual capital expenditure for upgrades and renewals each financial year and the date the works were brought to account
- The "Account Between Surveys" file treats the actual capital expenditure appropriately to reflect the changes to the overall accounting figures as well as allowing for annual depreciation and indexation.
- This process is carried forward until the time of the next condition survey when new total asset group valuation figures will be delivered from the new data within the AMS.
- A book adjustment will be needed at the end of the carried forward period in order to move to the valuation figures coming out of the new survey.

5.2.2 Specific Procedure:

1. Undertake a field survey of the asset group to be valued.
2. Place all of the data within the appropriate Moloney AMS module and thus deliver the reference or starting point Accounting valuations for replacement value, WDV and annual depreciation
3. Carefully archive a copy of the full AMS details that delivered the reference point Accounting valuation figures. This copy should be made read only and **MUST NOT** be amended in any way.

4. Use the “Account Between Survey” file to deliver accounting valuations for each financial year after the initial survey and prior to a subsequent survey. The results here can be reconciled with actual cash expenditure within the annual accounts. (See the file for more details)
5. Maintain a second working copy of the AMS (Current Assets) where all capital works details that are undertaken are recorded within the system. This copy of the AMS is not used at all for any accounting purposes at this stage, but enables the AMS to continue to deliver appropriate engineering capital works programs.
6. At some point in the future undertake a second full survey of the asset base and again place the results within the AMS to deliver a new set of Accounting valuations.
7. Reconcile the valuation differences between the figures resulting from the second survey and the figures from the original survey with the annual adjustments for cash expenditure and depreciation that have been made in the “Account Between Surveys” File.
8. Do the necessary accounting adjustments between the two valuation results adopting the valuations from the second survey coming from the AMS as the new valuation figures.
9. Based upon the variation between the two sets of valuation figures review the unit rates and life cycle values within the AMS.
10. Archive the full details within the AMS for the second survey and commence the second cycle of the above process.

5.2.3 The Account Between Surveys File:

This file is designed to track asset valuations for the years between full condition surveys. It enables the reconciliation of asset valuations with actual cash expenditure for the time between the 2 surveys.

You may enter or amend data only
Within the green Shaded Cells

Asset Class **Sealed Surfaces**

Original overall asset valuations - Year 1 Valuations
Sources from other Moloney Modules

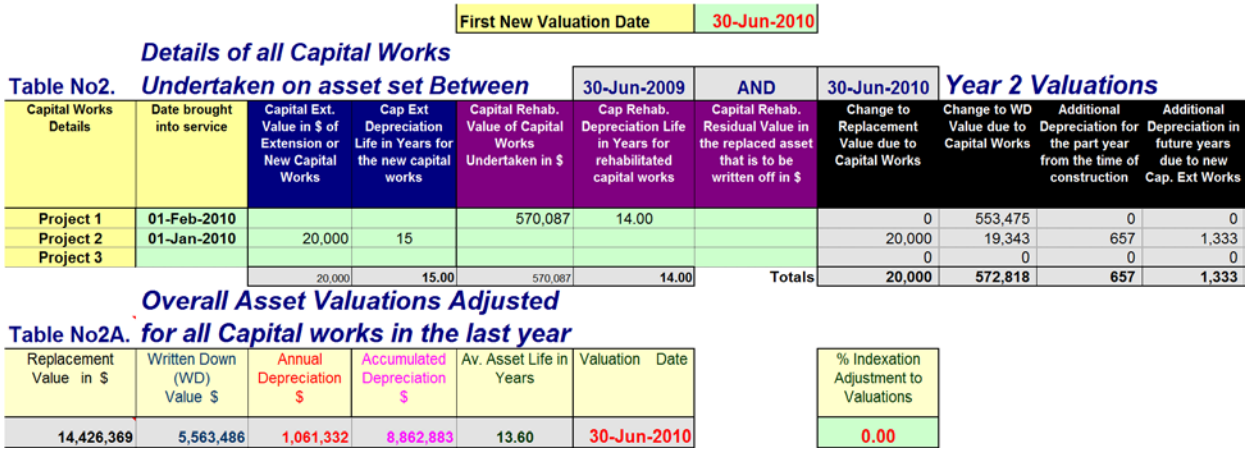
Table No1.

ASSET GROUP DESCRIPTION	Replacement Value $	Written Down (WD) Value $	Annual Depreciation $	Accumulated Depreciation $	Av. Asset Depreciation Life	Commencing Valuation Date	Comments
Sealed Surfaces	14,406,369	6,051,342	1,060,675	8,355,026	13.58	30-Jun-2009	Commencing Date
Future Modified Valuations							
Sealed Surfaces	14,426,369	5,539,405	1,061,332	8,886,964	13.60	30-Jun-2010	Year ahead 1
Sealed Surfaces	14,426,369	4,477,397	1,062,008	9,948,972	13.60	30-Jun-2011	Year ahead 2

Figure 11 Account Between Surveys – Valuation Summary

Figure 11 is a copy of Table no 1 from a sheet within the Account Between Surveys File. You need a single sheet for each of the sub asset sets that you wish to value within the file. The top row of data under the headings represents the starting valuations that are copied to this location from the AMS following a condition assessment and full revaluation.

The figures below that with the heading “Future Modified Valuations” come from the tables below table 2 and represent the modified valuations after the starting year based on the cash expenditure in, and depreciation out. See Figure 12 below for details. The start date can be any date and does not have to be the end of a financial year.



First New Valuation Date 30-Jun-2010

Details of all Capital Works

Table No2. Undertaken on asset set Between 30-Jun-2009 AND 30-Jun-2010 Year 2 Valuations

Capital Works Details	Date brought into service	Capital Ext. Value in $ of Extension or New Capital Works	Cap Ext Depreciation Life in Years for the new capital works	Capital Rehab. Value of Capital Works Undertaken in $	Cap Rehab. Depreciation Life in Years for rehabilitated capital works	Capital Rehab. Residual Value in the replaced asset that is to be written off in $	Change to Replacement Value due to Capital Works	Change to WD Value due to Capital Works	Additional Depreciation for the part year from the time of construction	Additional Depreciation in future years due to new Cap. Ext Works
Project 1	01-Feb-2010			570,087	14.00		0	553,475	0	0
Project 2	01-Jan-2010	20,000	15				20,000	19,343	657	1,333
Project 3							0	0	0	0
		20,000	15.00	570,087	14.00	Totals	20,000	572,818	657	1,333

Overall Asset Valuations Adjusted

Table No2A. for all Capital works in the last year

Replacement Value in $	Written Down (WD) Value $	Annual Depreciation $	Accumulated Depreciation $	Av. Asset Life in Years	Valuation Date	% Indexation Adjustment to Valuations
14,426,369	5,563,486	1,061,332	8,862,883	13.60	30-Jun-2010	0.00

Figure 12 Adjustment details to Year 2 Valuations

Figure 12 illustrates the affect of two capital works projects on the next year's asset valuations. Project 1 was a rehabilitation project and hence affected the WDV only. The spend was $570,087 but the affect on the WDV as at 30/6/2010 was only $553,475 this is because it was brought to account on 1/2/2010 and so there was some annual depreciation on the new asset within that financial year.

Project 2 was an upgrade or extension to the system. In this case the $20,000 spent added $20,000 to the replacement value $19,343 to the WDV (part depreciated within the year) and $657 additional annual to the current year (part year only) and $1,333 depreciation for the full year in future years.

Note also at the bottom of the table there is an allowance for annual indexation. The newly created valuation figures in Table 2A are transferred back up to Table No 1. Within Table 2 there is also the capacity to write off an amount of residual value that may have been remaining in an asset that was rehabilitated. For example you may have rehabilitates the main street for aesthetic reasons when it was only at condition 5 (its residual value can be accounted for in Table2).

The File has been set up to operate for a maximum of 8 years but this could be extended if required. The capital expenditure can be put in as a job lot for the asset set as was done in Figure 12 for the Rehabilitation projects, or it can be put in at an individual project level. Either way the total expenditure listed will always reconcile with the actual cash expenditure in the accounts.

This process is carried on for each of the intervening years between the major asset condition surveys and once a new survey is undertaken the values coming out of the survey supersedes the values carried forward within the file and a book reconciliation is necessary prior to adopting the new valuations. One good thing that does come out of this process is that it forces you to review the asset life cycles in line with the real movement that was found in the WDV.

5.2.4 Summary of overall process:

- Commence with the accounting valuations coming out of a full condition assessment of the assets
- Track the new overall accounting figures each year at a whole of sub asset level via a cash in and depreciation out technique in the "Account Between Surveys" File.
- Carry the above process forward till the time of the next condition assessment.
- Following the next condition assessment adopt the asset valuations coming out of that process and reconcile the valuation difference that has been carried forward with cash.
- Review asset life cycles in line with WDV movement

5.2.4 Suggested Directory set up for storage of AMS Details

The storage of multiple copies of the same basic AMS programs can present problems if not managed carefully. The process is simple, but often the AMS is accessed infrequently by those responsible for the preparation of the annual accounts. If the wrong figures are delivered to the accounting system then real problems will ensue.

It is vitally important you retain your records in a structured format that will be obvious to all users. Accordingly it is recommended that you adopt a well-structured and defined set of directory names that leave no room for confusion. This can be done in a number of ways and a sample method is detailed in the figure below.

Within the archived section you may need several sub folders. For example you may have inspected your sealed pavement assets in 2010 and the valuation results for that survey will be contained within a Roads Group set of the AMS files. You may have undertaken a survey of the unsealed roads in 2009 and require a second copy of the same Roads group AMS files for the recording of valuation data for these assets.

The minimum requirement is to maintain the data sets such that you could reproduce the valuation figures for the last survey on all sub asset groups acknowledging that this may involve multiple copies of the same AMS software.

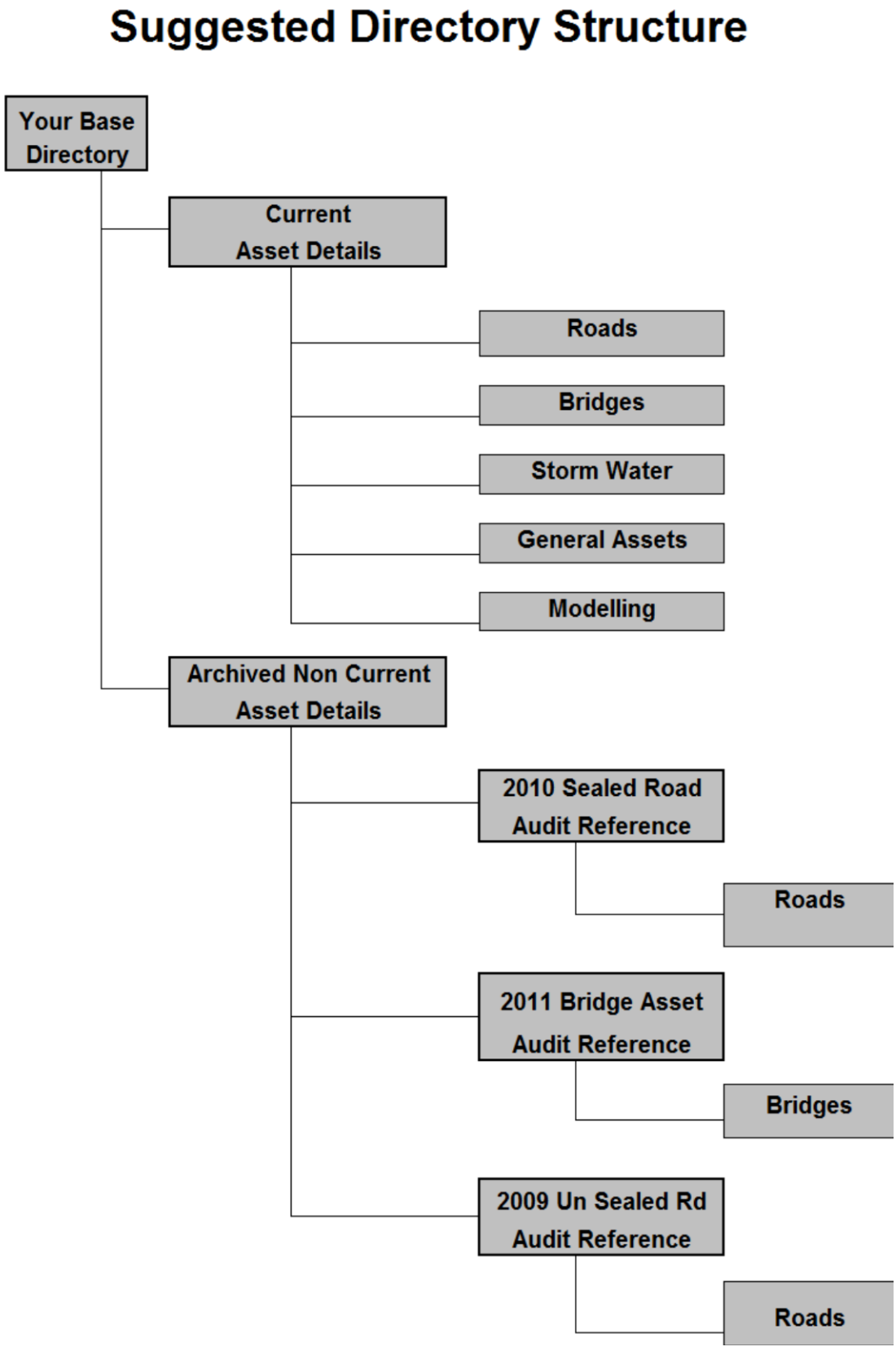


Figure 13 Suggested Directory Structure

5.3 The Unit Rate Method – AMS Updated Annually

If you do not need to reconcile your accounting valuations with cash expenditure each year then this is probably a better way to maintain your asset valuations.

The Moloney Roads AMS generates the three basic asset valuation figures of Replacement Value, Written Down Value and Annual Depreciation for each element or segment of the road assets as entered into the AMS. The Replacement value is derived by applying a unit replacement cost to an asset quantity, thus if capital works are undertaken the AMS will not reflect the actual cash expenditure. It is important to understand this point if adopting this valuation method

The Basis of the AMS Valuations delivered by the Unit Rate Method is:

- A complete survey of the assets is undertaken, data placed into the AMS and valuations delivered as at the date of the survey.
- When the next valuation is required all capital works details that have been undertaken since the time of the last survey are entered into the AMS along with their date of construction and the required valuation date is also entered into the system.
- Unit rates and life cycles are reviewed
- The AMS is run and updated and the new valuation figures are derived for the required date.

Table R1 Prog. Run Options	Last Update	Reports to be Run Place a "Y" in Column "I" against the Report options that you want to run		Valuation Date 30/06/2016 Description of options 1 - 9 in Column I	Adj. WDV for Time since Insp. Yes	Set Ann Dep to 0 if WDV = 0 Yes
1		Run Road Register Reports	n	Runs The two Road Register Report Sheets		
2	20-Jun-16	Footpath Sub Assets	Y	Runs Footpath Sub Asset File & Updates overall Figures on This Sheet.		
3	20-Jun-16	Kerb Sub Assets	Y	Runs Kerb Sub Asset File & Updates overall Figures on This Sheet.		
4	20-Jun-16	Sealed Pavement Sub Assets	Y	Runs Sealed Pavement Sub Asset File & Updates overall Figures on This Sheet.		
5	20-Jun-16	Un-Sealed Pavement Sub Ass.	Y	Runs Un Sealed Pavement Sub Asset File & Updates overall Figures on This Sheet.		
6	20-Jun-16	Sealed Surface Sub Assets	Y	Runs Sealed Surfaces Sub Asset File & Updates overall Figures on This Sheet.		
7	10-Jun-15	Street Furniture Sub Assets	n	Runs Street Furniture Sub Asset File & Updates overall Figures on This Sheet.		
8		Street Tree Sub Assets	n	Runs Street Tree Sub Asset File & Updates overall Figures on This Sheet.		
9		Run Class Valuation Reports	n	Updates the "Class Valuation" Sheet		

Figure 14 Valuation Update within AMS – Run Reports

Table No.R2 — Date of Asset Valuation *AS AT* 06/30/16

ASSET DESCRIPTION	Total Quantity	Units	Total Quantity	Units	Weighted Av. Asset Cond.	Replace. Value $	Asset Life in Years	Written Down Value $	Accumul. Deprec. $	Annual Deprec. $	Annual Liability Cost	Sub Asset File Last Updated on	Average Date of Cond. Assessment	Additional Accum. Dep Since Insp.
Footpath	18,659	Lin. Met	33,816	sqm	3.383	$1,960,791	52.1	$993,001	$967,790	$37,007	$37,007	20-Jun-16	15-Dec-15	$20,061
Kerb	59,447	Lin. Met			3.200	$5,451,399	78.1	$3,232,571	$2,218,828	$70,420	$70,420	20-Jun-16	15-Dec-15	$38,174
Sealed Pavements	738,455	Lin. Met	4,729,413	sqm	3.848	$106,448,891	83.9	$54,457,945	$51,990,946	$1,456,474	$1,456,474	20-Jun-16	15-Dec-15	$789,547
Unsealed Pavement	1,228,026	Lin Met	4,630,178	sqm	1.288	$20,008,689	34.5	$16,283,834	$3,724,854	$651,083	$651,083	20-Jun-16	6-Sep-15	$352,948
Sealed Surface	739,190	Lin. Met	4,038,213	sqm	3.744	$18,998,688	20.4	$8,358,337	$10,640,351	$928,519	$884,693	20-Jun-16	15-Dec-15	$496,748
Sealed Rd Formation	738,455	Lin. Met	5,595,500	sqm	0.000	$31,553,784	100.0	$31,545,226	$8,558	$15,777		20-Jun-16	15-Dec-15	$8,558
U/S Rd Formation	1,310,451	Lin. Met	6,300,533	sqm	0.000	$21,675,705	100.0	$21,668,731	$6,974	$10,838		20-Jun-16	6-Sep-15	$6,974
Street Furniture		No										10-Jun-15	1-Aug-14	
TOTAL VALUATIONS						$206,097,947		$136,539,645	$69,558,302	$3,170,118	$3,099,677			$1,713,011

Figure 15 Valuation Update within AMS - Valuations

In the valuation sample data within Figures 14 + 15 above the date of the original survey for all assets other than unsealed pavements was the same was and was just a little over 6 months before the required valuation date. Hence

the additional annual deprecation taken from the WDV was just a little over half of the one year figure for annual depreciation. The two tables come from the “Run” Sheet within the St Data2 File.

All capital works projects undertaken since the time of the last survey must be updated within the AMS which will lift the WDV in all cases and lift the Replacement value and Annual depreciation for upgraded assets only.

In addition to the above the unit rates would also be reviewed and amended as required prior to the updating of the valuation figures.

5.3.1 Summary of Condition Based Valuation Updated Annually within Roads module:

- Commence with the accounting valuations coming out of a full condition assessment of the assets as at the date of the survey
- Update the AMS with the details of all Capital works since the time of the last survey
- Review and amend the unit rates and life cycles as necessary
- Set the required valuation date
- Run the AMS update from the Run sheet of the St Data2 file
- New valuations are created within the 7 sub asset files with the overall summary returned to Table R2 of the Run Sheet (see Fig 15 above)
- Archive a read only copy of the complete set of the AMS files so that it can be retrieves again if needed for audit

6.0 Age Based Asset Valuations

Valuations have been based on asset condition within the Roads module since it was first created in 1995. But more recently auditors have become quite sceptical of the WDV coming out of condition based valuations. The concern is quite justified with the most common problem being that asset condition is simply too good to be believed. We have ourselves seen data sets where 80% - 90% of the sealed road pavement assets are purported to have lost no more than 20% of their value. This simply could not be true and rather than push for more accurate condition rating methodologies many accountants and auditors are opting for age bases valuations.

To some extent this does tie in more closely with traditional methods of asset valuation for accounting purposes. So in August 2016 we amended our roads module to give it the option of condition based or age based valuation.

6.1 Age Based Asset Valuation Overall Methodology:

Age based asset valuations have been established on the following basis:

1. Replacement value remains unchanged and is derived by multiplying the asset quantity by the adopted current unit replacement rate.
2. WDV is established by modifying the replacement value based on the remaining life of the asset.
3. Asset age is established by taking the date of construction from the required valuation date.
4. Remaining life is calculated by taking the age of the asset from the adopted total service life.
5. WDV is then calculated as the ration of the remaining life to the total life multiplied by the current replacement value.
6. Annual depreciation is calculated in the normal way by dividing the current replacement value by the service life of the asset and setting it to zero if there is no remaining life.

6.2 Age Based Asset Valuation Procedure:

To undertake asset valuations based on age there is one additional mandatory field that must be filled in for all assets in the data base and that is the date of construction of the asset.

6.2.1 Date of Construction Locations for assets:

Within the Master Sheet of the St-Data2 file there MUST be a date of construction for each individual asset that is recorded within the system. Initially you may not have all dates of construction available as assets may have been constructed over a very lengthy period in excess of 100-years. You may need to use your best guess or if you have

sound condition information create an age condition relationship to deliver an estimated date of construction. The actual construction dates will build up and become more accurate with time as these actual figures are entered into the data base.

The table below details the column identity within the Master Sheet of the St-Data2 file where construction dates need to be recorded for the different asset types if adopting age based asset valuations.

Asset	Footpath				Kerb				Street Furniture					Pavements	Sealed Surfaces
Location	Left Overall	Left Isolated	Right Overall	Right Isolated	Left O/A	Left Overall	Left Isolated	Right Overall	Item 1	Item 2	Item 3	Item 4	Item 5	All	All
Master Sheet Column for Date	**S**	**Z**	**AG**	**AN**	**AY**	**BE**	**BK**	**BQ**	**CS**	**CW**	**DA**	**DE**	**DI**	**FB**	**GK**

Figure 16 Column Locations for Asset Date of Construction for valuation purposes

Columns in Master Sheet M - Z

M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
FOOTPATH LEFT SIDE													
Footpath over full segment							Isolated Footpath						
Code	Wid m	Add Sub	Con 0-10	Iso Fail	Urg 0-3	Const Date	Code	Len m	Wid m	Con 0-10	Iso Fail	Urg 0-3	Const Date
C75	1.20	-10	**4**			01/1970	AS	120	1.50	**2**	1	3	01/2008
C75	1.20	-10	**5**	10	3	01/1965							
C75	1.20	-10	**5**	4	2	01/1965							
C75	1.20	-10	**5**			01/1965	C75	55	5.00	**1**			01/2005
C75	1.20	0	**5**			01/1965							
C75	1.50	-10	**2**			01/2000	AS	50	1.80	**3**			01/2000
C75	1.50	-19	**5**			01/1963							

Figure 17 Example of Date recording for Footpath assets

Within Figure 17 above column S contains the dates of construction for the Left side footpath that is recorded as running the full length of the segment + or - any additional length in column O. Column Z has the construction dates for the isolated pieces of footpaths on the left side. Note that the dates can be displayed in a number of formats but MUST be in an Excel date format.

6.2.2 Asset Age calculation

The age of each individual asset is calculated within the Sub asset files when they are updated by taking the construction date as recorded above from the required valuation date that is placed within Cell J2 of the "Run" Sheet within the St-Data2 file.

6.2.3 Remaining Life calculation

Remaining life is determined by Taking the asset age from the total service life as recorded within the Codes Sheet of the St-Data2 file

FOOTPATH CODES

		7.00			
CODE	FOOTPATH CODE DESCRIPTION	VALUE Normal $ / sqm	Small $ / sqm 20	Foot/P Life Years	Valuations Updated By / ON
AS	Asphalt	50.00	125.00	30	PM July 2016
BP	Brick Paveing Conc. Or Clay	120.00	300.00	50	PM July 2016
C75	Concrete 75mm	70.00	175.00	70	PM July 2016
PC	Pattern Concrete	90.00	225.00	50	PM July 2016
RC	Reinforced Concrete Foortpath	90.00	225.00	80	PM July 2016

Figure 18 Record of Asset service life.

Figure 18 is a part copy of the codes sheet within the St-Data2 file and related to the Footpath assets. Unit renewal rates, repair rates for small areas and asset lives are recorded here. Note that the life for different types of footpaths can be quite different, in this case ranging from 30years up to 80 years.

6.2.4 WDV or present worth based on age

The WDV is calculated within the "valuation' Sheet of each of the sub asset files (in this case the Footph_2 file) by taking the remaining life as a proportion of the total life and then multiplying that by the total replacement value.

434	53,765	**Tot & Av Fig**		Tot F/P Length		73,216	**3.64**	5,261,174	68.4	2,514,787	79,507	35.99	32.45	2,638,079	78,683
	$5,261,174	73,216 sqm													

Valuation Date 30/06/2016

Seg I.D. No.	ROAD OR STREET NAME	SEGMENT DETAIL				FOOTPATH ASSETS			Valuation details				Age Based Valuations			
		FROM		TO		Code	Area	Con	Replace. Value	Asset Life	Written Down	Annual	Asset Age	Rem Life	Age Based	Annual
		Street Name or Description	Dist. m	Street Name or Description	Dist. m		sqm	0-10	$	Years	Value	Deprec.	in Years	Years	WDV	Deprec.
129.4	Adelaide St	Marina Way	100	Burnett St	211	C75	152	**5**	10,605	70	3,030	152	5.58	64.42	9,760	152
130.4	Adelaide St	Burnett St	211	Ewington St	304	C75	106	**0**	7,392	70	7,392	106	18.58	51.42	5,430	106
780.4	Adelaide St	Ewington St	304	Andrew St	398	C75	101	**0**	7,056	70	7,056	101	18.58	51.42	5,183	101
608.4	Adelaide St	Andrew St	398	Goulburn St	568	C75	203	**4**	14,196	70	6,084	203	18.58	51.42	10,428	203
607.2	Adelaide St	Goulburn St	568	Adams St	640	C75	80	**5**	5,628	70	1,608	80	18.58	51.42	4,134	80
607.4	Adelaide St	Goulburn St	568	Adams St	640	C75	74	**5**	5,208	70	1,488	74	47.58	22.42	1,668	74
606.2	Adelaide St	Adams St	640	Friend St	700	C75	65	**5**	4,536	70	1,296	65	18.58	51.42	3,332	65

Figure 19 Sample of Age based WDV calculations for Footpath assets from Sub Asset Files

The hundreds or thousands of individual segments making up the total asset valuations are individually calculated within the sub asset files with the totals transferred to the "Run" sheet of the "St-Data2" file once updated. Within Figure 19 Note that the age based WDV and the annual depreciation are both different to that based on condition. Easy to understand why the WDV is different. Annual depreciation is mostly identical as is the case for all samples above. But the total value at the top of the figure is a little lower for the age based valuation. This is because there was a small extent of the asset base that was still in service beyond it's designated service life that delivered a zero annual depreciation when based on age, but it had not yet got to the end of the condition range so was still being depreciated when based on condition.

6.2.5 Activating Age based Valuations

With construction dates entered for all assets as per section 6.2.1 above go to the "Run" Sheet of the "St-Data2" File and call up "Yes" within Cells O5 - O10 as appropriate. You would normally undertake the same valuation methodology (Age or Condition) for all road assets. But, the program will allow different methodologies for different assets.

Table R1 Prog. Run Options	Last Update	Reports to be Run Place a "Y" in Column "I" against the Report options that you want to run		Valuation Date 30/06/2016 Description of options 1 - 9 in Column I	Adj. WDV for Time since Insp. No	Set Ann Dep to 0 if WDV = 0 Yes	Set WDV Based on Age	Date Run for Age based WDV
1	4-Jul-16	Run Road Register Reports	n	Runs The two Road Register Report Sheets				
2	12-Aug-16	Footpath Sub Assets	Y	Runs Footpath Sub Asset File & Updates overall Figures on This Sheet.			Yes	12/08/2016
3	12-Aug-16	Kerb Sub Assets	Y	Runs Kerb Sub Asset File & Updates overall Figures on This Sheet.			Yes	12/08/2016
4	12-Aug-16	Sealed Pavement Sub Assets	Y	Runs Sealed Pavement Sub Asset File & Updates overall Figures on This Sheet.			Yes	12/08/2016
5	12-Aug-16	Un-Sealed Pavement Sub Ass.	Y	Runs Un Sealed Pavement Sub Asset File & Updates overall Figures on This Sheet.			Yes	12/08/2016
6	12-Aug-16	Sealed Surface Sub Assets	Y	Runs Sealed Surfaces Sub Asset File & Updates overall Figures on This Sheet.			Yes	12/08/2016
7	12-Aug-16	Street Furniture Sub Assets	Y	Runs Street Furniture Sub Asset File & Updates overall Figures on This Sheet.			Yes	12/08/2016
8	8-Aug-16	Street Tree Sub Assets	n	Runs Street Tree Sub Asset File & Updates overall Figures on This Sheet.				
9	4-Jul-16	Run Class Valuation Reports	n	Updates the "Class Valuation" Sheet				

Figure 20 Table R1 on the Run Sheet of St-Data2

Figure 20 shows where you set the desired valuation methodology. In the second last column set "Yes" if you require Age based asset Valuations and "No" if you require condition based valuations. The valuation date is entered into Cell J2 and if valuations are to be based on age you **MUST** have "No within Cell L2 for adjusting WDV since the time of the condition Survey. With fields all set go to the "Roads" menu and select.

Roads / 2. Run Sheet - Update sub asset files / Run all reports Nominated with "Y" in Table 1

This will update the sub asset files that you have nominated in Table R1 and bring back the overall results into table R2. The sub asset files will always contain the valuation details that are based on age (see Figure 19 above). This can provide a useful comparison between the two valuation methods.

If valuations are to be based on condition then the sub asset files will not record any details for age based valuations. Mainly because without all construction dates present the report would be very misleading.

7.0 Summary

The Moloney AMS creates a set of valuation figures down to the individual asset level. This can be very fine or quite course depending upon your requirements. There are several ways in which the system can be used to both establish the initial asset valuations and to then carry them forward with time. In a broad sense asset valuations can be undertaken in the following ways.

7.1 Initial Asset Valuations

There are two basic methods within the Moloney system to establish the initial asset valuations

1. Age based valuations as at a particular point in time
2. Condition based valuations as at the date of a condition survey.

7.2 Carrying forward asset valuations

The carrying forward of asset valuations from the initial valuation date needs to be looked at separately for the two valuation methods.

7.2.1 Age based Valuations Carried Forward:

If basing asset valuations purely on age there is really no need to ever inspect the assets other than for the purpose of setting works programs, bench marking of performance and financial analysis of future renewal demand. The ongoing suggested methodology is as follows.

- Update construction dates for all capital works within the system, review unit rates and life cycles and then update the age based valuations from the "Run" sheet to the required new date (Most likely approach for ongoing age based valuations)
- Commence with an age based snap shot of asset valuations and then use the "Account between surveys" file so that variations to the valuations will reconciled with cash expenditure until the next major revaluation.

7.2.2 Condition based Valuations Carried Forward:

- Start with a snap shot of asset valuations based on a condition survey as at a set valuation date. Update the AMS with all capital works activities and set date of inspections to the date of the latest reconstruction. Review unit rates and life cycles. Update the valuations within the AMS allowing for the additional annual depreciation since the time of last survey to be taken from the WDV.
- Start with a snap shot of asset valuations based on a condition survey as at a set date. use the "Account between surveys" file so that variations to the valuations will reconciled with cash expenditure until the next condition survey.

The valuation path chosen will depend on accounting requirements and the adopted methodology will be strongly linked to what the relevant auditors and accountants are comfortable with.