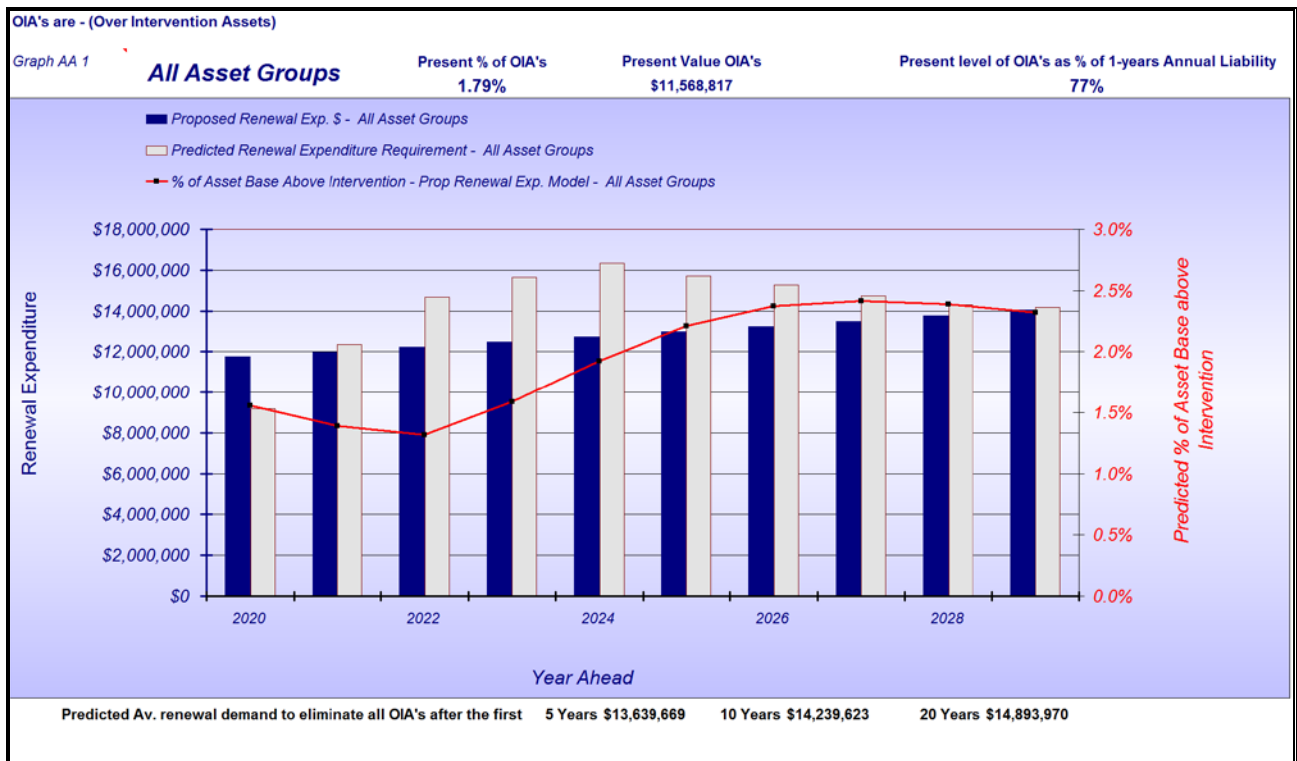


# Moloney Asset Management Systems MAMS



Notes on the use of the  
Funding Scenario Finder  
19/6/2019

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# The "Funding Scenario Finder"

Last Updated 19th of June 2019

## 1.0 Introduction

These notes are intended as a guide to the use of the "Funding Scenario Finder" that is contained within the "ModelAll" file of the Moloney financial modelling software. There are other documents that provide a detailed explanation of how the model works and you are directed to one titled "The Basis of the Moloney Model" for that information.

This document details how the "Funding Scenario Finder" operates and how it can be used to establish a recommended future funding profile for a single asset set, or for a number of different asset sets and in so doing optimise the level of renewal funding between the various asset sets that are being modelled.

## 2.0 What does the "Funding Scenario Finder" do

Model No 1 the "Proposed expenditure model" within the Model All File predicts future asset condition based on a proposed expenditure profile. Different renewal expenditure profiles can be trailed and the predicted condition outcome delivered

The "Funding scenario Finder" uses Model No 1 through an iterative process to deliver the reverse of what it was designed to do. A future funding profile is delivered that is based on three variable inputs as detailed within Figure 1 below. You choose:

1. Desired % of over intervention assets - 1.52%
2. The number of years ahead that you wish to achieve this by - 10 Years
3. The % value of any annual compounding increase that you want - 2.0%

The three variable inputs are set within table MV6 of the "Modelling Variables" sheet, as seen in Figure 1 below. When the "Funding scenario finder" is activated it commences by estimating the year 1 commencing expenditure and then running the model in the normal way. Model 1 predicts future condition based on that estimated starting spend. From here an iterative process is used that amends the first trial expenditure up or down depending upon the condition outcome. The iterative process continues until Model No 1 delivers the extent of OIA's to the desired level as set within Table MV6 (1.50%). There is a tolerance of 0.05% that halts the process.

2	10.4	13.0		
1	8.0	10.0		
0	4.0	5.0		
Years to Cond 10	80.0	100.0		
Years to Intervention	69.6			

Table MV6			
"Funding Scenario Finder" - Creates an Expenditure profile			
1	Desired % of over Intervention Assets (OIA's)	1.50	Years worth of Annual Liability 1.1
2	Years to Achieve desired level of OIA's	10	
3	Annual Percentage Increase in Expenditure	2.00	
4	Present % OIA's within this data set	3.50%	

Button MV 5 Sets up "Annual Liability" Formulae in Cell H25

Fig 1 - Table MV 6 on Modelling Variables sheet of the Model All File

Figure 1 contains the whole of table MV6 that deals with the running of the "Funding scenario Finder" (FSF). It also displays the bottom portion of Table MV1. MV1 contains the details of the asset degradation curve. The portion of the table that is relevant to the FSF is the very bottom value of 69.5. This field is calculated during the running of the model and represents the asset life up to the selected intervention level. In this case it was condition 7 and based on the degradation curve there are 69.5 years to condition 7 and above that the total life to condition 10 is recorded at 80 years. We will come to why we need this figure a little later in this document.

At the bottom of table MV6 listed in Figure 1 as item 4, is the present extent of the asset base that is over the intervention level. In this case it is 3.50%. This figure is linked to a value within another sheet within the file (and hence the colour code of the cell shading). It is provided for reference purposes only but can be quite useful in understanding where you are sitting now. In this case the existing extent of OIA's is 3.50% and the program is asked to deliver 1.50% within 10 Years.

It could be asked. Why don't we simply use model 2 (Predicted Capital Requirement)? The reason is that Model 2 is designed to eliminate ALL OIA's within the first 5 years and can result in a degree of over servicing. The FSF allows you to carry a nominated level of OIA's and furthermore to get to that point within a nominated time frame.

## **2.1 The input variables**

The input variables as detailed within Figure 1 above enable you to set a desired condition outcome to be delivered within a selected time frame. Variable 3 (% of annual compounding funding increase) enables the lowering of the commencing renewal spend. The idea here is to provide a means of lowering the year 1 start spend back to your current spend and finding the percentage of the annual increase needed to get you from where you are now, to where you need to be.

The desired extent of OIA's can be individually set for each asset set to be modelled one at a time. Or as will be explained later, can be set via a formulae and then applied to all 20 data sets within "Model All".

## **2.2 What does the Funding Scenario Finder (FSF) Deliver**

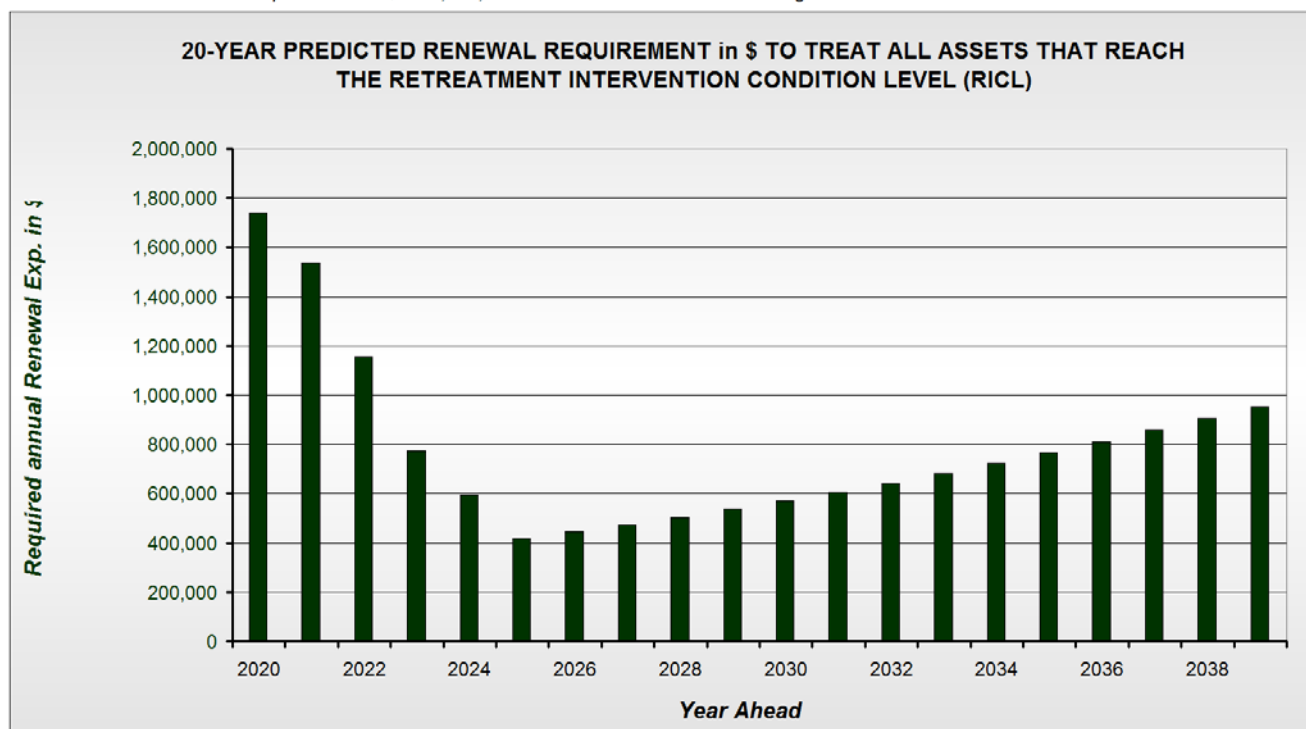
The FSF was run for a set of sealed road pavement assets based on the inputs as per Figure 1 above.

Figure 2 below comes directly from the Moloney Model 2 "Predicted Renewal Expenditure Requirement sheet. This is a 20 year graph of the predicted annual renewal expenditure needed to eliminate ALL OIA's.

Model No 2 eases in the renewal demand over the first 5 years if the raw renewal demand is 30% greater in year 1 than in year 2. This is done in order to avoid a very high peak in year 1 followed by a large lowering of demand in year 2.

Note that in this case the renewal expenditure has been eased in over the first 5 years because the raw year 1 figure was greater than 30% higher than the raw year 2 figure. Note also that the Year 1 figure is at \$1,740,000. This high demand is to be expected as there were 3.5% of the assets as OIA's at the start of the process (see item 4 in figure 1).

At the bottom of the graph is the calculated average annual renewal figure for 5, 10 and 20 years respectively. If the figure of \$1,160,000 pa was maintained for the first 5 years then the model predicts that all OIA's would have been eliminated. They would not be eliminated after year one by spending at the year one figure of \$1,740,000.



Average annual Renewal demand For first Five Years **\$1,160,101** Ten Years **\$817,704** Twenty Years **\$784,835**

Fig 2 – Predicted capital renewal requirement to eliminate all over intervention assets

### 2.2.1 What the FSF can deliver

By accepting a manageable extent of OIA's the FSF can dramatically reduce the renewal demand and deliver a far more manageable and acceptable funding profile.

Total Asset Group Start Value \$ 117,373,235

Each 1% Above the RICL Represents \$ 1,173,732

RICL 7.00

Present % over Intervention 0.03%

Value over Intervention \$41,081

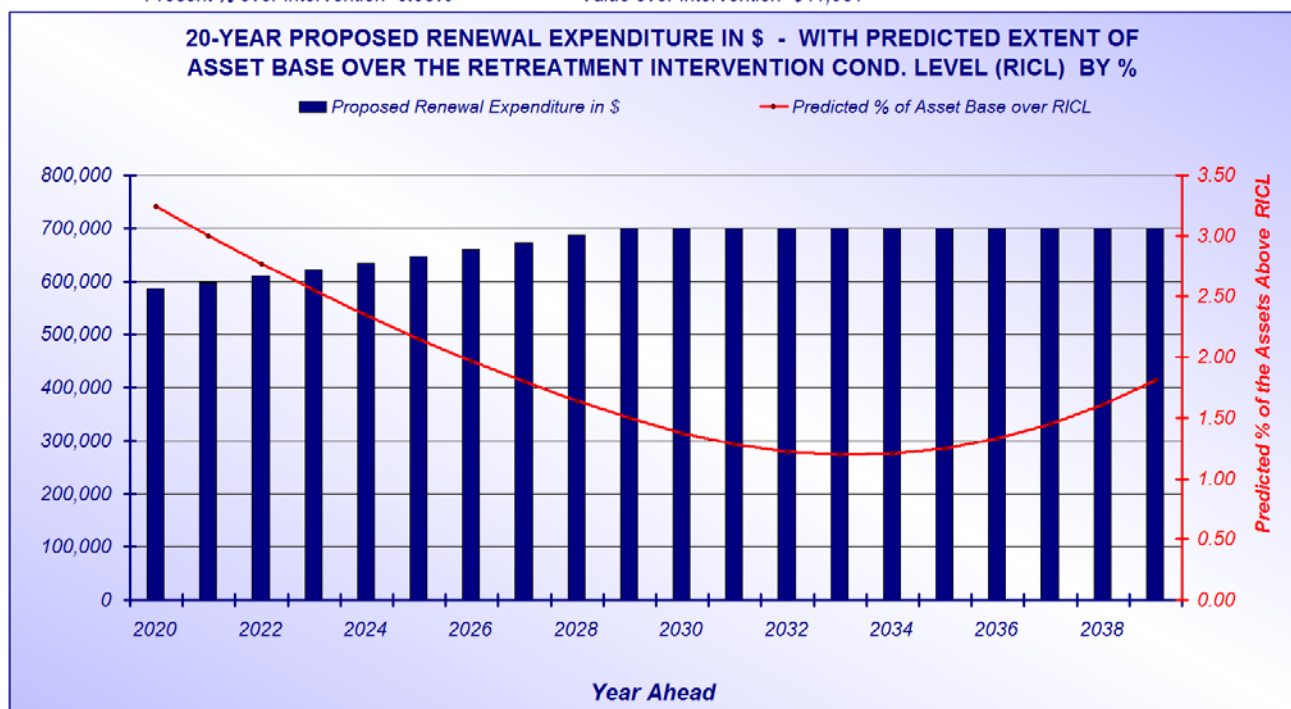


Fig 3 – Results 1 from the single FSF run

Figure 3 above presents the result delivered within the "Funding Scenario Finder" program for a single asset set. Here the aim was to establish a proposed expenditure profile that would deliver on the following inputs.

Percentage of OIA's	1.5%
Time to achieve this	10 Years
Annual Percentage Compounding Increase	2.0%

Note that the commencing expenditure here is far less than the requirement in Figure 2 at \$586,000 pa. But we have had to accept a level of OIA's of 1.5%

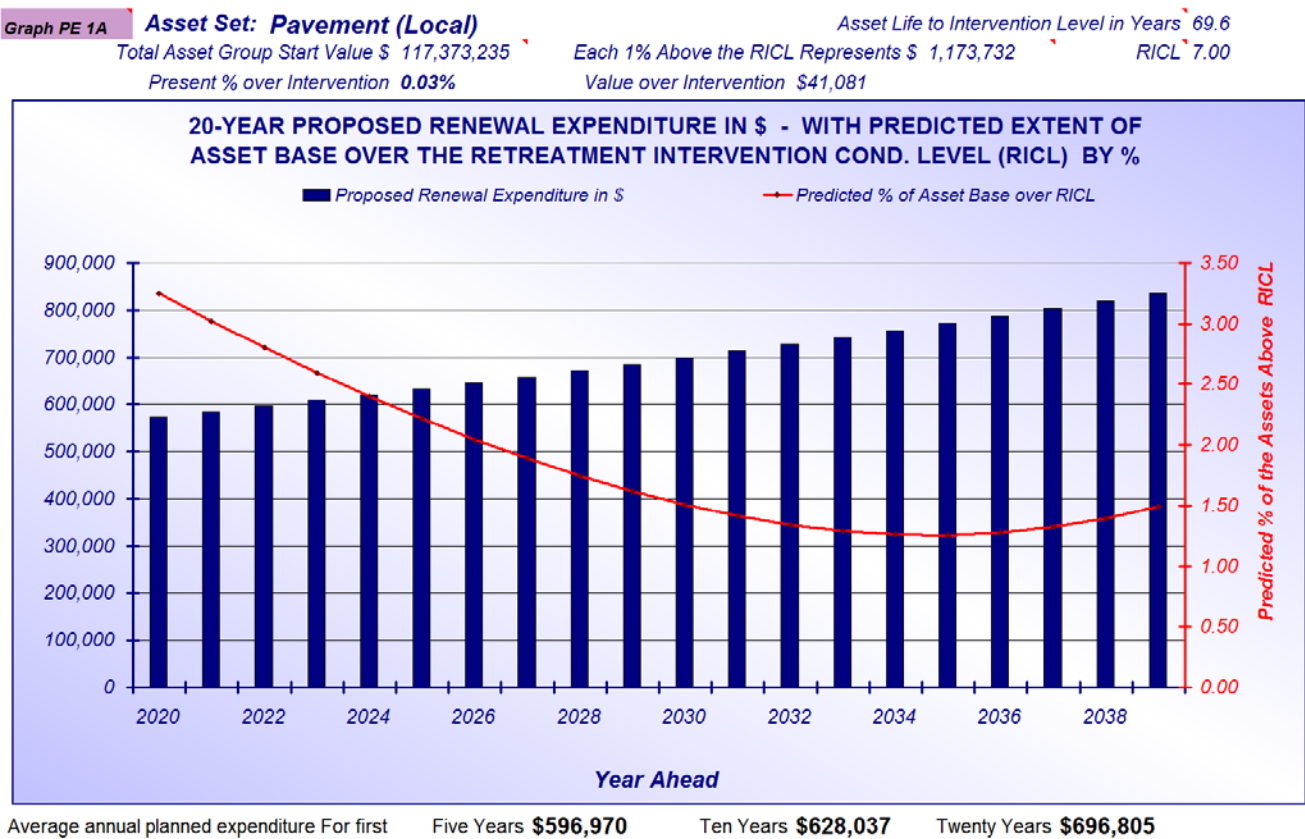


Fig 4 – Results 2 from the single FSF run

Figure 4 contains the results of a single use of the FSF for the same data set but this time we have pushed out the time to deliver the condition outcome to 20 years

Percentage of OIA's	1.5%
Time to achieve this	20 Years
Annual Percentage Compounding Increase	2.0%

Note that the acceptance of a compounding annual increase has lowered the year 1 expenditure to \$573,000 pa. The aim of the percentage annual increase is to enable the development of a funding strategy that commences from where you are now, if you are under funding the total renewal expenditure.

3.0 Funding Scenario Finder - Run for Individual Data Sets

The FSF can be run for all 20 data sets at a time or for a single data set. Sometimes you may need to run for a selected single data set after running all 20 before. For example you may

be happy to have a small percentage of OIA's for most assets but for high risk assets such as footpaths you may want no OIA's. So in this case you could run all 20 first then load the footpath assets separately and re run the FSF for them with a zero level of OIA's.

### 3.1 Setting up the Data within Model All

Here we will deal with the steps necessary to set up the data within "Model All" in order to run the FSF.

**SHEET NOTES:**

Managing Amendments in Model All

The 6 Control Buttons to run the program are contained below  
See the flow diagram opposite for more details

<div>Button Note</div> <div>Button 1</div> <div>Sends the first 20 Data Sets within the Required Data Sheet of this file to the Moloney ModelAll.xls File.</div>	<div>Button Note</div> <div>Button 3</div> <div>Sends Data Sets 21 to 40 within the Required Data Sheet of this File to the Moloney ModelAll.xls File.</div>	<div>Button Note</div> <div>Button 5</div> <div>RUN The full program without Stopping  (Buttons 1 - 4 &amp; 6))</div>
<div>Button Note</div> <div>Button 2</div> <div>Transfers the first 20 Data sets from Moloney ModelAll.xls file to the Asset Graphs.xls File.</div>	<div>Button Note</div> <div>Button 4</div> <div>Transfers Data sets 21 to 40 from ModelAll.xls to the Asset Graphs.xls File.</div>	<div>Button Note</div> <div>Button 6</div> <div>Update the Asset Group links in the Asset Graphs.xls File  Also Run with the Button 5 operation Above</div>

Fig 5 – The Run and Review Sheet Buttons

Figure 5 shows the six operational buttons within the "Run and Review" sheet of the "Input Pro Forma" file.

Figure 6 below provides a diagram to show the flow of the data and the buttons operations within the 3 Moloney Files.

Button 6 sets up Asset Graphs based on your desired group reporting as set within the "Required Data" sheet of the IPF.

Button 5 runs the full program by first sending the second 20 data sets to Model All and analysing them (Individually undertaken with Button 1). It then puts those results through to Asset Graphs (Button 2 Individually). Then it takes the first 20 data sets from IPF and puts them into Model All (Button 3 Individually). Next it transfers the first 20 data set results to Asset Graphs (Button 4 individually). Finally it sets up Asset Graphs to display the results within the reporting groups as you set in the IPF. (Button 6 Individually).

Note that at the completion of this process you end up with the first 20 data sets in Model All.

## Moloney Financial Modelling Program

### Flow Chart of Operations from "Run and Review" sheet of "Input Pro Forma

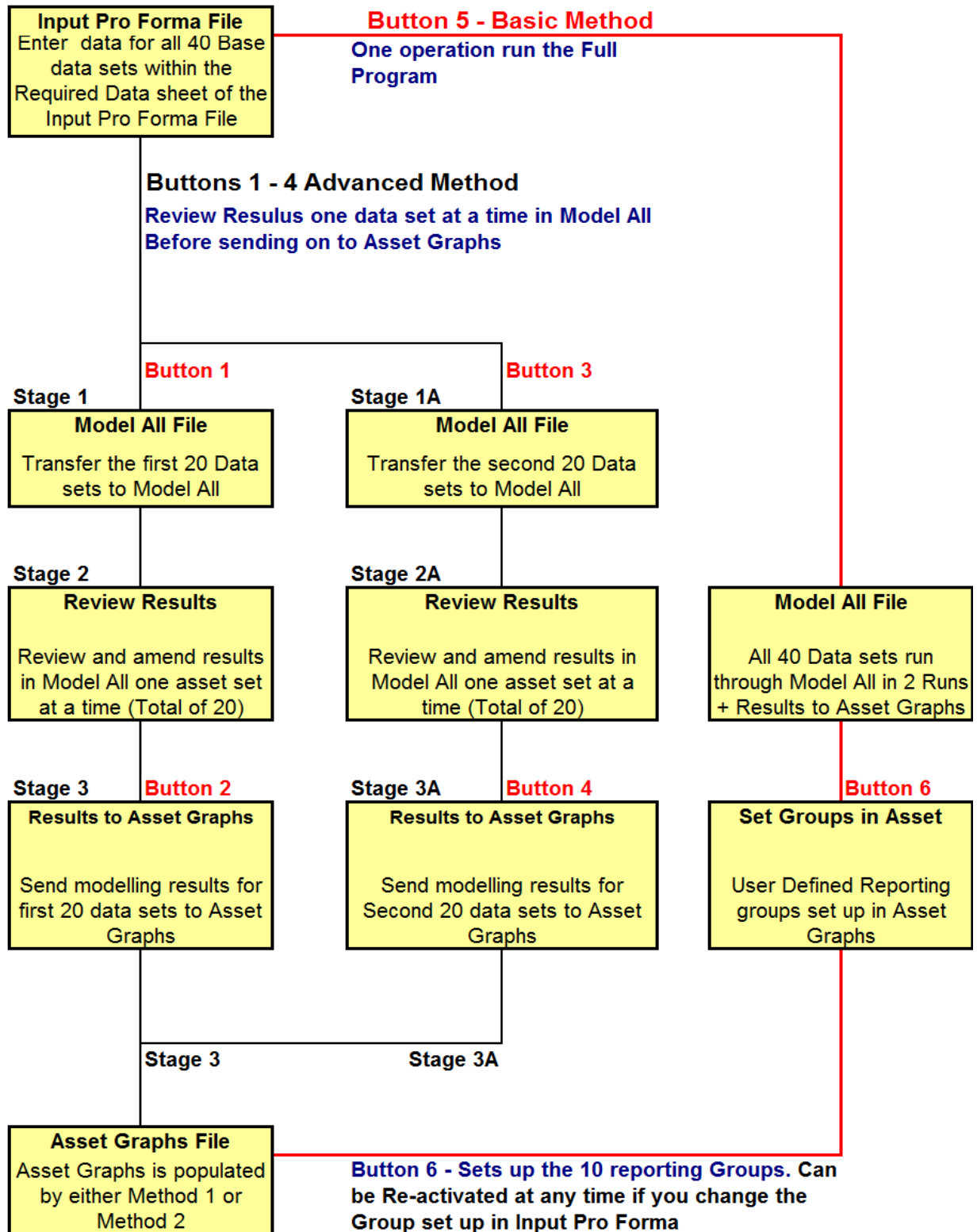


Fig 6 – Diagram of data flow and Button operations



### ***3.1.1 Ensure that Asset Graphs has been set up for reporting groups***

The Moloney Financial model has the capacity to model 40 individual data sets and to then group them into 10 possible reporting groups. See the document "Financial Modelling Version N3" for full details, but broadly with all data within the "Input Pro Forma" (IPF) you need to undertake the following.

- Activate Button 6 from "Run and Review" Sheet within IPF
- Best to then Activate Button 5 from IPF
- Go to "Model All" to "Modelling variables" Sheet to commence FSF operations

Button 6 above will set up your reporting groups within "Asset Graphs". Button 5 will run the second 20 data sets into Model all, processes, then runs the results through to "Asset Graphs". Following this it will do the same with the first 20 data sets and you will end up with data sets 1 - 20 within "Model All".

It is recommended that you run button 5 first, if you are commencing a new modelling exercise, as it will clear out any data that happens to be within "Asset Graphs" from an earlier modelling exercise.

You can just use Buttons 1 - 4 once you are sure that Asset Graphs is set up for your reporting groups, but it is still recommended that you activate Button 6 followed by 5 when setting up a new modelling project with different asset group configurations.

### ***3.2 Running the FSF for Individual Data Sets***

Once you have transferred the data sets to "Model All" as per 3.1 above you can apply the "Funding Scenario Finder" for each individual data set (total of 20) or you may need to amend a single data set that required special attention after running all 20 on the same basis. To undertake FSF operations on a single data set proceed as follows:

- Load Data Set 1 from the Modelling Menu in the Model All File (Add Ins / Modelling / 1. Load a Data set 1 - 20) / Load Data Set 01)
- Set the required input parameters within Cells **H25 – H27** on the Modelling variables sheet in table MV6.
- Run the "Single Funding Scenario" from the Modelling Menu (Add Ins / Modelling / 2. Modelling variables sheet / 2. Run single Funding Scenario) or use shortcut keys **Ctrl "j"**
- Review results in Graph PE1A on the Model 1 Proposed Expenditure Sheet
- Amend Inputs and re run again if required
- To save results within Model All file only, Activate **Button MV1** around Cell M2 of Modelling Variables Sheet. This saves your results only within Model All.
- Load another individual asset set and repeat the above process. Do this for all the data sets you wish to amend

### ***3.3 Sending Results back to "Input Pro Forma" and on to Asset Graphs***

- Upon completion of the above your results will be all stored in the Model All File only.
- Activate **Button MV2** on the Modelling variables Sheet of Model All to send all results back to "Input Pro forma"

- Go to "Input Pro Forma", "Run and Review" Sheet and **activate Button 2** to send results to asset Graphs. (Use button 4 if you are operating with data sets 21 - 40)

### **3.4 Dealing with the second 20 Data Sets in Input Pro Forma**

Use **Buttons 3 and 4** on the Run and review sheet and repeat the above for the second 20 data sets if required.

## **4.0 Funding Scenario Finder - Running Multiple data set**

The "Funding Scenario Finder" can be used not only on a single data set within "ModelAll" but it can be applied to all 20 - data sets within the file in a single operation. In this way the model not only optimises the funding requirements for each individual data set but it effectively further optimises the total budget between the individual data sets involved.

The commencing point for the modelling process will normally be the "Required Data" sheet within the "Input Pro Forma" file. From there 40 data sets can be transferred to the "ModelAll" file in two groups of 20. This document does not cover the population of the "Input Pro Forma". There are others that do that. But detailed below is a brief summary of the data flow and the broad process of delivering a "Funding Scenario" once the initial data is housed within "Model All ". Refer also to section 3.1 above for more detail on the flow of data within the Moloney Modelling software generally and in particular from the Input Pro Forma through to Asset Graphs.

### **4.1 Running the FSF for all 20 data sets from the one command**

- Set the three parameters within Cells **H25 – H27** on the Modelling variables sheet within the "Model All" File (see Figure 1 above).
- Note that within Cell H25 you can set a formulae that delivers the extent of OIA's based on other variables such as asset life. See APPENDIX "A" below for our recommended formulae within Cell H25. See also the note within Cell J25.
- Activate **Button MV4** around Cell U2 of the Modelling variables Sheet
- A recommended funding scenario will be created for all 20 data sets with the overall results displayed within Graph APE 1A on the "Aggregate Proposed Expenditure" Sheet.
- Review results – Amend criteria as required and run again if necessary. At this stage your results are only stored within the "Model All" File.
- When happy with the results activate Button MV2 on the "Modelling variables sheet to both save the results within "Model All" and to update the planned expenditure profile you have just developed back to the "Input Pro Forma" File
- To complete the process go to the "Run and Review" sheet within "Input Pro Forma" and activate **Button 2**. This will update the "Asset Graphs" file with your funding scenario results for the first 20 data sets within "Input Pro Forma".
- You can repeat the above process for the second 20 data sets within "Input Pro Forma" by using **Buttons 3 and 4** in place of 1 and 2 above

Figure 7 contains the results of the FSF that was run for all 20 Data sets within "Model All". Inputs into Table MV6 (See sample table in figure 1) were 1.5% of the asset bases as OIA's after 10 years with a zero annual percentage increase.

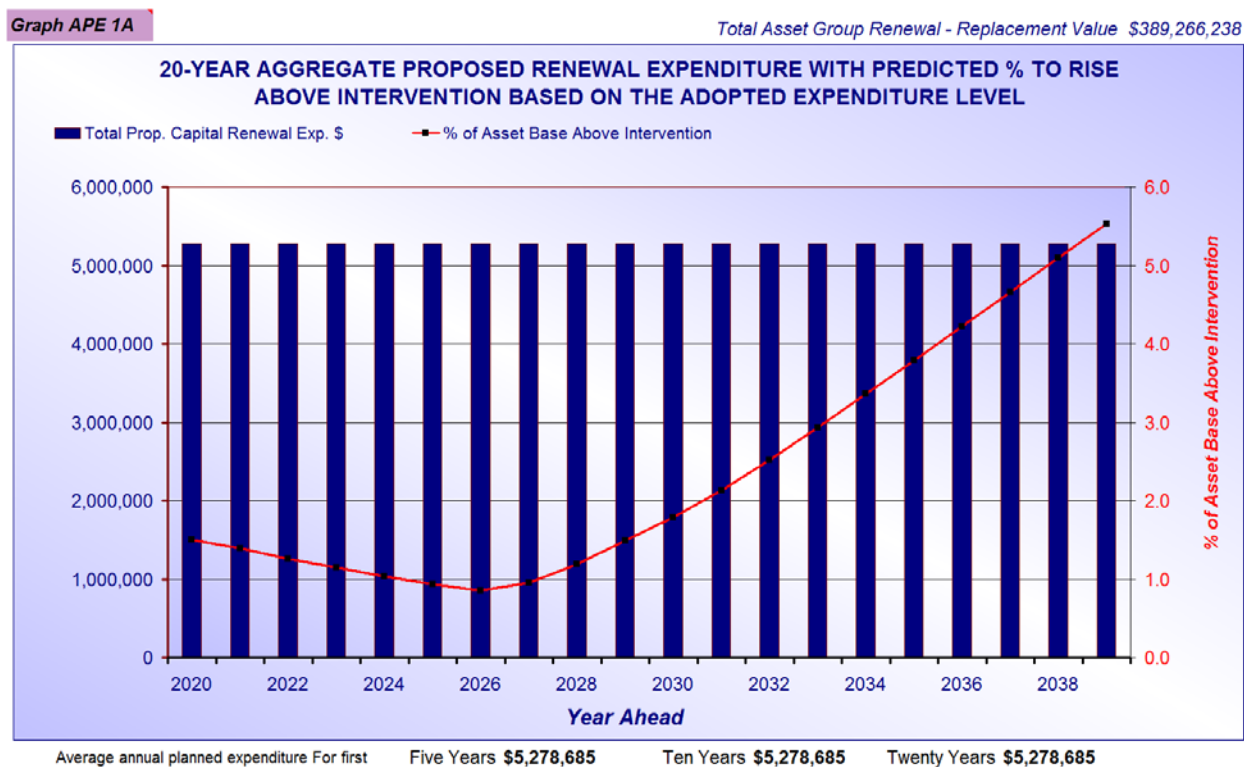


Fig 7 – The FSF Results for 1.5% OIA's after 10 Years - no compounding increase

The commencing renewal expenditure was found to be \$5,280,000 and is flat for the full modelling period. (No annual compounding increase was called for).

Note that the total extent of OIA's within figure 7 after 10 years is 1.5% as set but demand does rise in the second decade and the planned renewal expenditure will need to be lifted in that second decade. If we has set the time frame to 20 years to deliver the same 1.5% of OIA's the predicted annual renewal expenditure would have risen to \$6,150,000 pa.

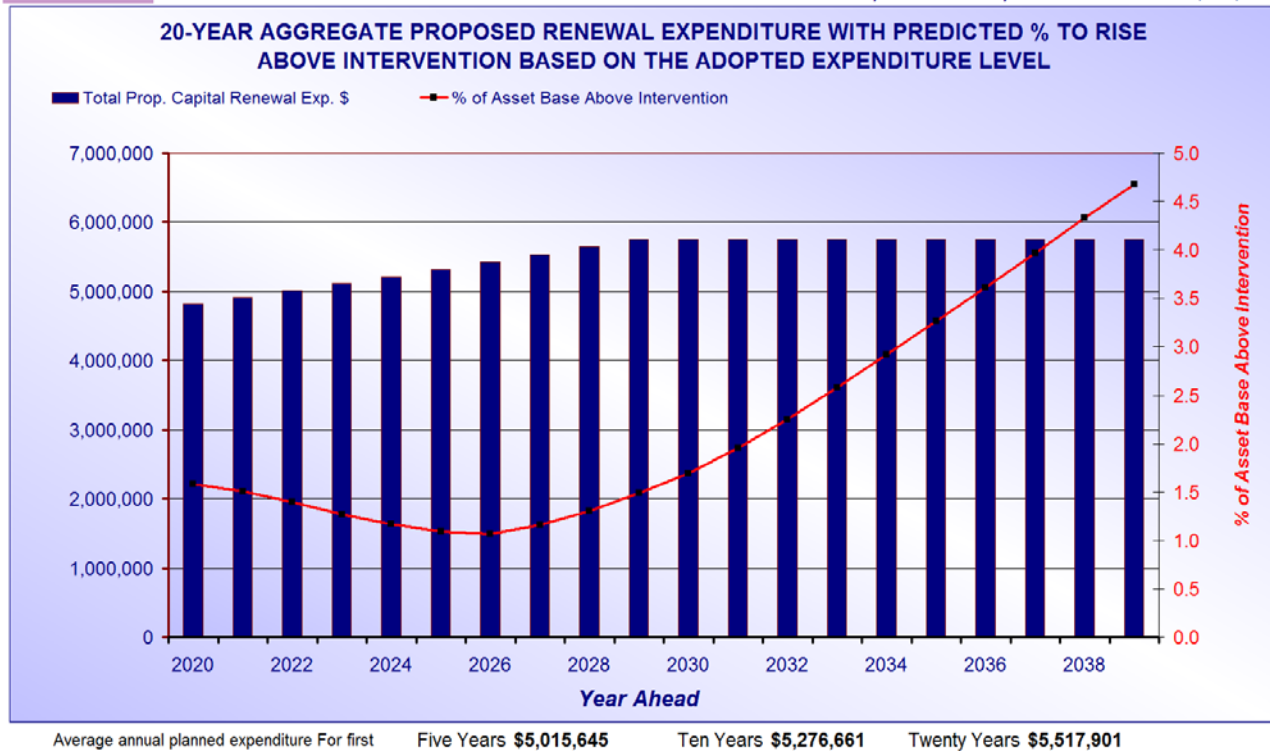


Fig 8– The FSF Results for 1.5% OIA's after 10 Years + 2% Compounding

Lets assume our current spend was at \$4,800,000 pa. To get the year 1 expenditure down to this figure and to deliver the same extent of OIA's of 1.5% after 10 we found that we needed a 2.0% compounding increase for 10 years see Figure 8 above. Again the second decade will require higher expenditure but a 10 year prediction is considered reasonable.

The FSF was used to deliver figure 8. It was found that a 2.0% annual compounding increase in funding was necessary to lower the years 1 spend down to \$4,800,000 (same as current level). Hence the FSF was used to deliver a planned future renewal funding scenario that will take you from where you are to where you need to be in 10 years.

## 5.0 Buttons on the Modelling Variables sheet of Model All File

There are 4 buttons at the top of the "Modelling Variables" sheet within the "Model All" File commencing around Cell M2.

Button NOTE	Button NOTE	Button NOTE	Button NOTE
<b>BUTTON MV 1</b> Copies Current Modelling Variables to "Data Storage" and updates Aggregate Sheets	<b>BUTTON MV 2</b> Transfers all variables for the full 20 Data Sets back to "Input Pro Forma"	<b>BUTTON MV 3</b> Copies the 50 Year required Exp from Model 2 to Table MC 2 Below	<b>Button MV 4</b> Deliver 20 - Year Recommended Expenditure Profile

Fig 4 – Buttons 1 - 4 on the Modelling Variables Sheet

There are extensive excel notes within Row 1 on the sheet that describe what each button does and you will need to access these buttons when running FSF trials for single asset sets within Model All and when running all 20 in the one operation. A summary of the buttons operations is provided below

1. **Button MV 1** is used to store any changes to a single active data set (one of 20 in the Model All File). If you have made amendments to one data set and wish to retain those changes within the Model All file. For example you have run the FSF for a single data set or you have amended an intervention level and run the model to see the results.
2. **Button MV 2** is used to transfer the results of all 20 data sets within the Model All file back to the Input Pro Former File. This would be done if you had amended several individual data sets within Model All or run the FSF for all 20 data sets and then wanted to save those changes within the system. (Note that to carry the changes through to asset Graphs you need to undertake a further step within the Run and Review Sheet of the Input Pro Forma File via buttons 2 or 4)
3. **Button MV 3** will copy the 50 year required expenditure profile for a single data set from Model 2 Predicted Capital Requirement into Table MV 2 on the Modelling variables sheet. This would be done if for example you had a single data set that you absolutely wanted to be fully funded with no over intervention extent for the full modelling period.
4. **Button MV 4** is used to run all 20 data sets within the "Model All" file through the "Funding Scenario" process based on the settings within Table MV 6. Note that to carry the results through to "Asset Graphs" after the completion of this process you still need to hit button MV2 and to then go to the Run and Review sheet within the Input Pro Forma file and activate Buttons 2 or 4 as appropriate.

## **6.0 Brief Summary of the operations – Run all 20 in Model All**

- Start with a populated Input Pro Forma File
- Send first 20 data sets to "Model All" File **Button 1** "Run and Review" Sheet within "Input Pro Forma" File. Or run all from Button 5. Either way you end up with the first 20 Data sets from IPF within the Model All file.
- Set required variables in **Table MV6** on "Modelling Variables" Sheet within "Model All" file
- Run the program for all 20 data sets from **Button MV4** on "Modelling Variables" Sheet
- Send results back to the "Input Pro Forma" file from **Button MV2** on the "Modelling Variables" Sheet
- Send results from "Input pro forma" to "Asset Graphs" via **Button 2** on "Run and Review" Sheet within "Input Pro Forma" File
- Repeat all of the above for the second 20 data sets using **Buttons 3 + 4** on "Run and Review" Sheet

## ***Appendix A: Recommended Formulae for FSF when modelling all 20 data sets in Model All"***

Section 3.2 referred to our preferred formulae to be used within Cell H25 of the "Modelling Variables" Sheet of the "Model All" File when running all 20 data set through the FSF. There is an explanation within the "Funding Scenario Settings" Sheet of the "Model All" File and it is presented here with a few additions.

### ***A1 - Selecting the extent of Over Intervention Assets OIA's and the concept of "Annual Liability"***

This is the most critical of the 3 inputs and requires careful consideration, if you wish to run several data sets with different service lives within the one operation you need a formulae that accounts for the different service lives of the assets.

Consider two data sets. One with a service life of 10-years and the other 100-years

To set a single level of OIA's of say 10% would result in one years average consumption as the level of OIA's for the 10-year assets and 10-years average consumption for the 100-year assets

Thus the 10-year service life assets would be maintained with a quite acceptable level of OIA's and the 100-year assets would have an extremely high level of OIA's

We have adopted the term "Annual Liability" as the average annual asset consumption rate based on the total asset set replacement value divided by the service life as set within the model. It is similar to "Annual Depreciation", but because of the need to comply with Australian and International accounting standards, which are aimed at delivering a figure for tax deductibility, Annual Depreciation is not always linked to the actual future Annual Liability of the assets.

So for example, if two asset sets to be modelled had a total replacement value of \$100,000 each and one has a service life on 10 years while the other had 100 years, The Annual liability would be \$10,000 and \$1,000 respectively. Thus we need a formulae that delivers a required percentage of OIA's that is linked to a common level of years worth of Annual Liability.

### ***A2 - Linking the level of OIA's to the Number of Years worth of "Annual Liability"***

Over our 23 Years of assessing road and bridge assets, we have developed a link between the extent of OIA's, expressed in terms of years worth of Annual Liability and the overall condition of the whole asset set.

There are a number of ways of expressing the overall condition of an entire asset set. The "Weighted average asset condition" is one we sometimes use. But it has little relationship to predicting future renewal demand.

We find that the level of OIA's is the best measure of overall asset condition and asset performance. The level of OIA's expressed in years worth of "Annual liability" takes this one step further and enables all assets to be compared for condition performance and to use the



concept to set a single overall asset condition across all asset classes irrespective of asset life. It effectively eliminates asset life as a variable.

Table A1 below contains a series of nine standardised overall condition descriptors that we have developed from the results of around 250 full condition audits of Council road networks over the last 24 years.

### **Guide to the acceptable extent of over intervention assets OIA's**

% Range of one years Annual Liability	Standardised Condition Description	Additional Comments on Descriptor
0% - 50%	Exceptionally good	Verging on Over servicing
50% - 100%	Excellent	Very low level of over intervention assets
100% - 150%	Very Good	low level of over intervention assets
150% - 200%	Good	Low to acceptable level of over intervention assets
200% - 250%	Fair	Condition only Fair and a little below the good range
250% - 300%	Acceptable	Level of OIA's at the upper extent of the acceptable range
250% - 350%	Poor	Moving into the start of the problem area
350% - 400%	Very Poor	In need of urgent reduction
400% and Above	Disastrous	Severe problems with assets in this condition

**Table A 1**

Table A1 provides a guide to what we consider to be the overall asset set condition descriptors for a range of OIA's expresses in years worth of "Annual Liability"

To have a zero level of OIA's is probably over servicing. Up to half of one years average long term consumption is considered to be exceptionally good. At one years annual liability your position is excellent and so on through to 3.5 - 4 .0 Years where your position is very poor. Another way of looking at it is to think of the level of OIA's expressed in this way as the number of years worth of backlog that you have in front of you expressed in years worth of average annual consumption or "Annual Liability".

### **A 3 The setting of an appropriate formulae.**

The funding Scenario Finder can be run for a single asset set, or for all 20 possible asset sets within "Model All" at the one time. If running single data sets you may choose to set the Level of OIA's within Cell H25 for each individual run as a simple single percentage. (eg. 2.2%)

But if running multiple data sets you will need to be aware of the affect of service life on the acceptable level of OIA's

Cell B27 on the "Modelling Variables" Sheet records the full service life of the individual asset set that is being modelled up to the selected intervention level. Thus we can use this figure to set the extent of OIA's within cell H25, linked back to the number of years worth of average consumption.

### A3.1 Setting the Formulae within Cell H25

Table A2 below contains a view of part of the "Modelling Variables" Sheet within the "Model All" File. Table MV1 contains the details of the asset degradation curve and shows a total asset life to condition 10 of 80 - years. It also shows at the bottom of the table a total service life to intervention level 7.0 of 69.6 - years.

To set up a formulae within Cell H25 that delivers the corresponding percentage of OIA's that equates to one years worth of Average Consumption or as we term it "Annual Liability", we need to divide the total service life within Cell B27 (69.6 years) into 100. This delivers a figure of 1.44% as seen within Cell H25 (The top centre figure in Table MV6).

Thus the formulae within Cell H25 to deliver one years "Annual Liability" as the value of OIA's is  $(= 100/B27)$  which is at the top of the "Very Good" Range as per Table A1.

$= (100/B27) \times 2.0$  would deliver two years average annual consumption and would be at the top of the "Good" range as per Table A 1.

**Table MV1**

**Asset Degradation Rate**  
Expected life within  
each Condition Rating

Condition Factor	Expected Life in Years Within Condition	Percentage of Total Asset Life within Cond. Rating
0 Good		
10 Bad		
9	0.8	1.0
8	3.2	4.0
7	6.4	8.0
6	10.4	13.0
5	12.8	16.0
4	12.0	15.0
3	12.0	15.0
2	10.4	13.0
1	8.0	10.0
0	4.0	5.0
Years to Cond 10	80.0	100.0
Years to Intervention	69.6	

**Table MV4**

Rehab Interv Condition Level	Asset Return Cond.	Year Ahead to be Analysed	Actual Year Ahead
7.00	0	20	2039

**Table MV5**

**Capital - Maintenance Cost Relationship**

Present Maintenance Exp Level	20
Maint Adjustment Ratio	1.40

**Table MV6**

<b>"Funding Scenario Finder" - Creates an Expenditure profile</b>			
1	Desired % of over Intervention Assets (OIA's)	1.44	Years worth of Annual Liability
2	Years to Achieve desired level of OIA's	10	1.0
3	Annual Percentage Increase in Expenditure	2.00	
4	Present % OIA's within this data set	3.50%	

Button MV 5  
Sets up "Annual  
Liability" Formulae  
in Cell H25

**Table A 2 -**

To make things a little simpler we have set up "Button MV5" at the bottom right of Table MV6 to create the appropriate formulae within cell H25. This program sets a formulae that delivers the percentage of the assets relating to one years "Annual Liability" and then it multiplies it by your desired extent of years worth of "Annual Liability" as nominated within cell J25 (Green shaded cell on right of table MV6 in the above table presently set at 1.0).

With the formula set up you can trial different years worth of Annual Liability for all 20 data sets within Model All by simply changing the figure within cell J25 and activating button MV 4.



Your results will be displayed within the "Aggregate Proposed Expenditure" sheet within the file when completed.

To push those results through to "Asset Graphs" there are two more operations you need to undertake.

1. Activate Button MV2 near cell P2 on the "Modelling Variables" sheet. This transfers the recommended expenditure profiles back to "Input Pro Forma"
2. The above action will take you back to "Input Pro Forma" and you need to activate Button 2 or 4 from the "Run and Review" Sheet to transfer the results to "Asset Graphs".

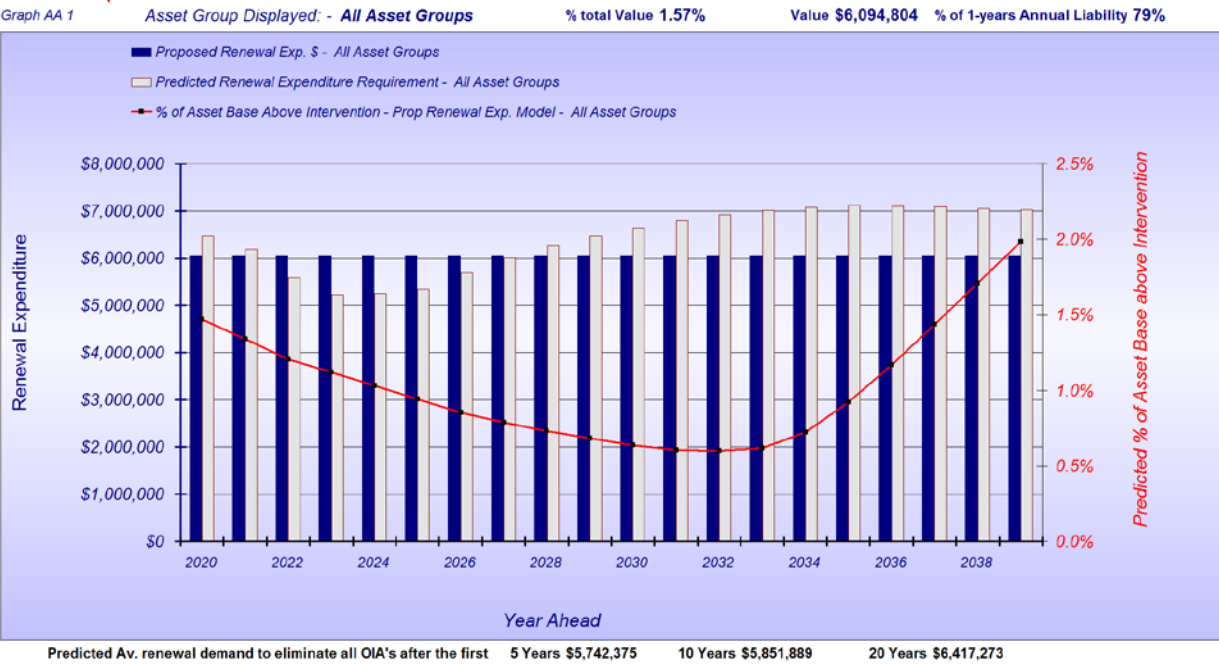
By setting a global condition outcome linked to the number of years worth of "Annual Liability" you will effectively deliver an optimised renewal expenditure profile between the 20 possible data sets that have been examined.

At the end of the process you may refine an individual data set manually. If for example you wanted a lower or higher level of OIA's for a particular asset set you could run all 20 data sets with a common outcome then load a single data set for individual treatment.

Refer to 3.2 above for instructions on running a single data set.

# Appendix B : Example of Scenario Finder Outputs

Some examples of outputs from the scenario finder are detailed below.



Graph B 1 - Projection 1 - See Settings below

- Variable 1 - One years "Annual Liability" (2.0% of network) level of OIA's
- Variable 2 - To be delivered after 20-Years
- Variable 3 - Zero Annual compounding annual increase

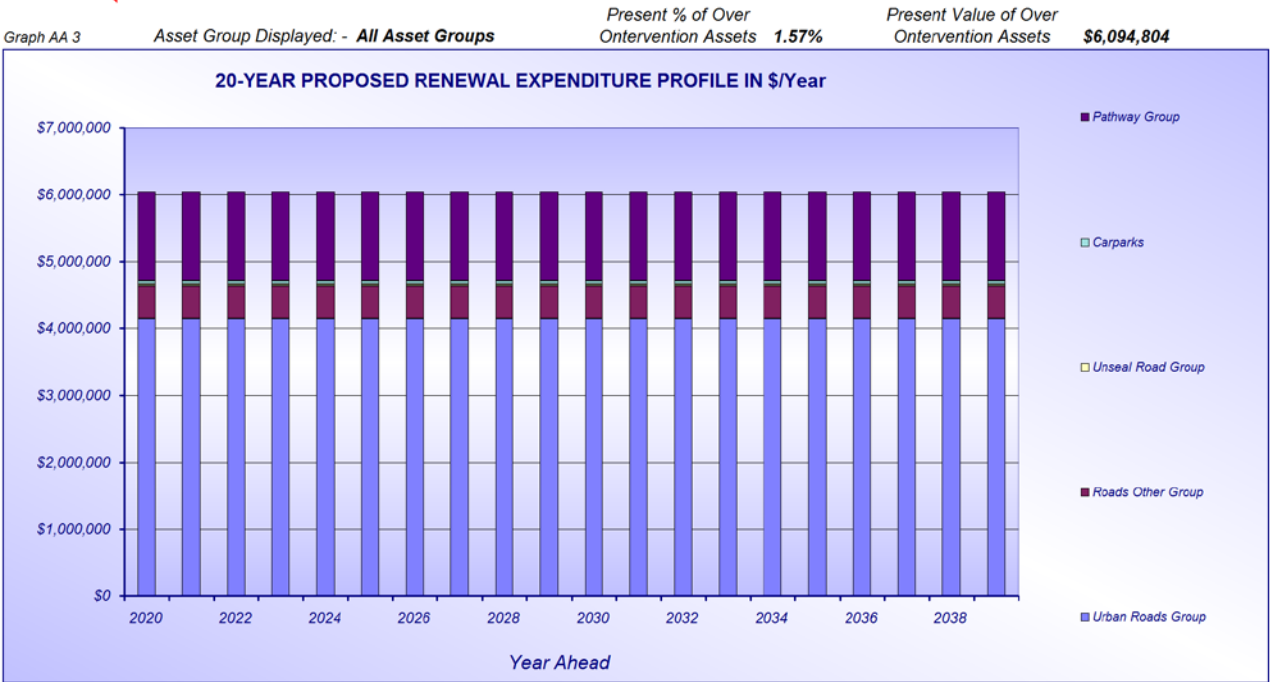
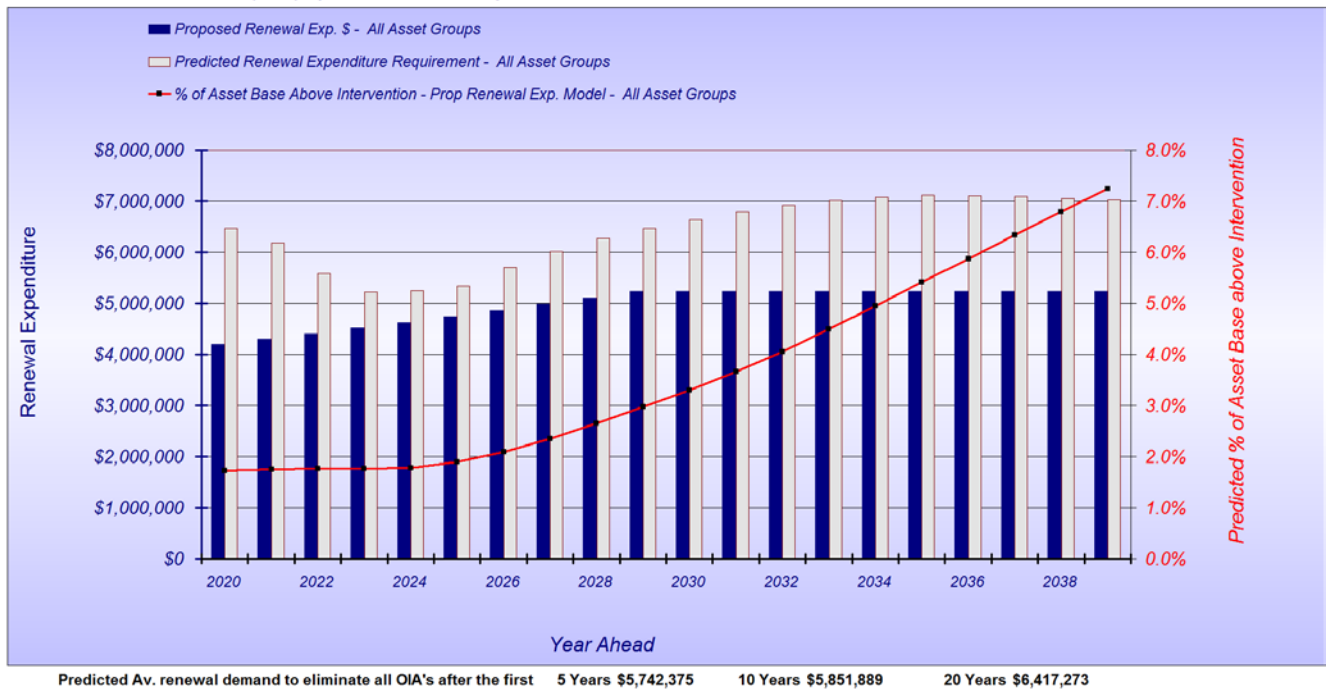


Table B 2 Projection 1 split by asset group

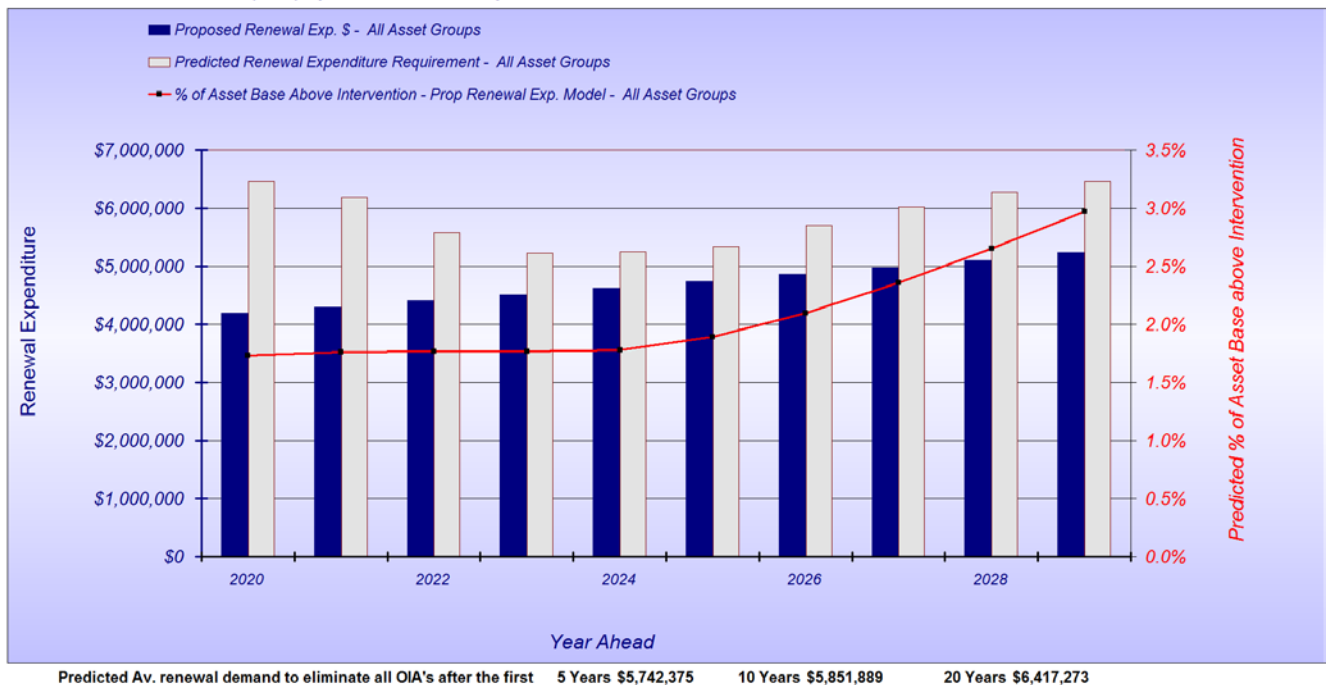


### Graph B 3 - Projection 2 - See Settings below

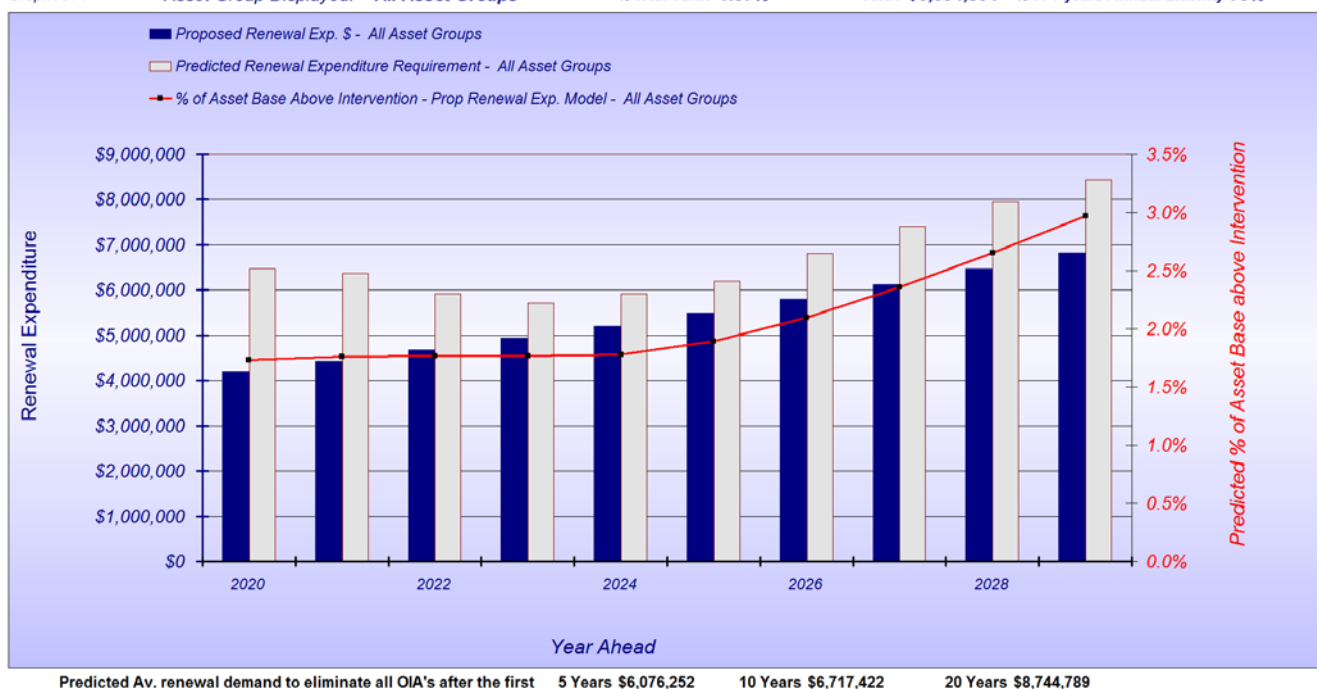
Variable 1 - One and a half years "Annual Liability" (3.0% of network) level of OIA's

Variable 2 - To be delivered after 10 Years

Variable 3 - 2.5% Annual compounding annual increase



### Graph B 4 - Projection 2 - Same as B3 But with 10 - Year Reporting



### Graph B 5 - Projection 2 - Same as B 4 But with 3% CPI Allowance

Graphs B 4 and B 5 are provided to illustrate that the model can be set for annual display from 5 - 50 years and it can also be amended to allow for CPI Increases

### Summary:

The "Funding Scenario Finder" is an extremely versatile tool that can be set up to deliver quite valuable funding scenarios over a large range of infrastructure assets. It can also allow for CPI movements as well as displaying different time frames from 5 - 50 year projections. It also assists with the allocation of renewal expenditure across different asset sets based on need.