MOLONEY SYSTEMS

NOTES RELATING TO THE DELIVERY OF

CAPITAL WORKS AND MAJOR MAINTENANCE SCHEDULES

AVAILABLE FROM WITHIN THE

ROADS MODULE

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1.0 Introduction

The purpose of this document is to firstly increase the awareness of certain maintenance scheduling reports that can be directly and indirectly extracted form our roads module. Secondly to provide a brief guide as to how to deliver these schedules.

Some schedules are directly built into our software and have further options from the unique Moloney programme menu. Others will need a little specific work in order to be delivered.

The document assumes a reasonable level of understanding of our Roads module and of Excel functions. It does not take a step by step approach to describing how to deliver the reports. Rather it is aimed at lifting the level of awareness concerning what can be delivered from a good field inspection survey.

In all cases it is strongly recommended that you also consult the members of your staff that are out and about the district and involved in the maintenance work. These people have the opportunity to view the assets regularly while the capital condition inspection is generally undertaken once every 3 - 4 years. Their input represents an extremely valuable recourse to you.

1.1 Road Sub Asset Groups Covered within the Roads Module

The Roads & Streets module of the Moloney Asset Management System deals with the following Road related sub asset components

- Footpath
- Kerb & Channel
- Street Furniture
- Street Trees
- Sealed Pavement
- Unsealed Pavement
- The Sealed Surface

1.1.1 Brief description of the Roads module set up

For full details of the Roads module you are referred to the document "Roads Manual Nov 2021" which can be obtained off our web site... This brief description is presented in order to provide you with the basis set up of the roads module.

	File Name	Function and Description
1	St-Data2	This is the Data storage file for all Road & Street Data detail. It is in essence the heart or database of the system. All original variable data is stored here.
2	Footph_2	This is the first of a series of 7 (sub asset files) that all depend upon the data within the St-Data2 file for their reports. The 7 sub asset files are used to undertake the asset valuations and to provide accounting and engineering reports specific to the sub asset.
3	Kerb_2	The second road sub asset file dealing with kerb assets
4	Pave_2	The third road sub asset file dealing with Sealed Road Pavement assets
5	Uspave_2	The forth road sub asset file dealing with Unsealed Road Pavement assets
6	Seal_2	The fifth road sub asset file dealing with Sealed Surface assets
7	StFurn_2	The sixth road sub asset file dealing with Street Furniture assets
8	Trees_2	The seventh road sub asset file dealing with Street Tree assets

9	Backup	Run from the St-Data2 File this file contains a Backup Copy of all of the variable data within the St-Data2 File. It can be used in both directions, That is you can send or retrieve data from Backup
10	Account Between Surveys 3	A file that has been specially developed to handle the accounting requirements for assets between major condition surveys where the present value of the asset is linked to asset condition and you require your valuations to reconcile with the cash spend.

The program has been designed to provide a systematic means of recording the physical dimensions, the type of sub asset and the condition of the sub asset. This information is then acted upon to produce management and accounting reports and to assist the asset manager with the task of future financial planning.

In addition to the above files MAMS also has a very widely used Financial Modelling module, which integrates, with the roads module to deliver predictive modelling outputs relating to future renewal demand associated with the road assets over a period of up to 50 years.

1.1.2 Brief description of the Roads module set up

The roads module consists of the first 9 of the above Excel files. The first is the data base for all variable data. The next 7 are the "Sub Asset report files" which are simply program reporting files all of which depend upon date from St-Data2. File 9 is used to backup and retrieve all unique data within St Data2. File 10 is an accounting based file that enables you to track your valuations for the years between the major condition surveys.

Most of the maintenance related reports will be delivered within the sub asset files. 2 - 8.

2.0   The standard reports within the sub asset files

Each of the 7 sub asset files have a standard set up. If we use the sealed road pavement file "Pave_2" to illustrate the set up there are the following 7 sheets as detailed below within it. This set up is mirrored within all 7 sub asset files accept for certain reports that are not considered appropriate for some sub asset classes.

2.1   The Sealed Road Pavement File - Sheet Details:

There are Seven Sheets within the Sealed Road Pavement File as listed below.

- Notes on File
- Codes Sheet
- Valuation Sheet
- Condition Report Sheet
- Isolated Failure Sheet
- Condition Graph
- Program Amendments

2.2   Sealed Road Pavement - Notes on File Sheet:

This sheet is an information sheet for the File. The intention is to provide enough basic information to get a user operating the system. The sheet also contains the date of the last Program update.

2.3   Sealed Road Pavement - CODES Sheet:

The Codes Sheet contains the Sealed Road Pavement code block that has been copies from the codes sheet of the **St-Data** File. The codes relevant to the sealed road pavement assets are copied across to the **Pave_2** File during the running of the Sealed Road Pavement valuation program. Note that all asset valuations are undertaken within the sub

asset files and that the codes while stored and amended within the St-Data2 file are actually used within the sub asset files.

2.4 Sealed Road Pavement - VALUATION Sheet

There is a detailed document titled "Road Asset Valuations Dec 2020" that covers all of the variables and adjustments that can be made within the Roads Module in relation to asset valuations. You are referred to that document for a more detailed explanation of the valuation methodology within the Moloney Roads Module.

2.5 Sealed Road Pavement - Condition Sheet

The Sealed Road Pavement Condition Sheet is generated by copying the required data from the Sealed Road Pavement Valuation Sheet and then modifying that data to produce the new report.

The sheet is presented as the first draft, Sealed Road Pavement, replacement program report. The report lists all of the Sealed Road Pavement segments in condition order with the worst condition pavement at the head of the table.

In preparing your proposed pavement replacement program you would start with this report containing all segments and then begin to eliminate those segments that for whatever reason are not to be considered. One thing to remember when amending this and any other sub asset report is that all reports within the file are generated from the data within the St-Data2 File. As such you may do what you like to any of the reports knowing that they can be replaced in their original format at any time by reactivating the program.

2.5.1 Sealed Road Pavement Hierarchy Weightings

Within the Condition sheet, if there is a road hierarchy present in the data set (Column HC of the Master Sheet) then the weightings applied to the Hierarchy Code within Table C12 of the Codes Sheet can be applied to the raw condition data to assist in the delivery of a more appropriate renewal program.

In brief if you placed a 0.8 weighting on a particular low priority hierarchy code than a raw condition 8 pavement would be lowered to condition 6.4 in the program condition field. Hence the lower priority project would fall down to a lower ranking on the condition sheet (used to develop rehabilitation programs) leaving the more important roads at a higher ranking. You can either lower the less important roads or raise the more important roads.

Hierarchy weightings are applied to the "Program condition" within column AB of the "Condition" sheet in the "Pave_2" file via the unique Moloney Pavement menu. No other details are amended so you can return to the original "Program Condition" quite easily.

2.5.2 Updating Cumulative Total figures in Column AP

If you delete rows of data from the condition sheet to arrive at your proposed pavement replacement program then you may find that the formulae that provides the cumulative total figures within column CG has been corrupted. To rectify this situation there is a program that can be accessed from the unique Moloney "Pavement" drop down menu.

2.6 Sealed Road Pavement - ISOLATED FAILURE Sheet

This report Sheet lists and costs the repair of all areas of isolated pavement failure that were identified during the condition survey. Pavement failures are identified in two forms. Immediate, that need to be attended to right now because of risk considerations and potential failures, where the failure is clear and evident but is not presenting any public risk. Both forms of failure are measured as a percentage of the total pavement area. There is a two stage costing structure for pavement repairs based upon the area to be repaired.

This report sheet takes its base information from the valuation sheet. It then calculates the area of the pavement failure and applies a unit repair cost as stored within the codes sheet. Failure repairs are priced at two rates. The higher rate relates to smaller areas and the switch point to the smaller area is user definable and stored in Cell K11 of the Codes sheet.

A similar facility for dealing with failures is available within the Footpath, Kerb, and Un-Sealed Pavement sub asset files.

2.7 Sealed Road Pavement - Condition Graph Sheet

This sheet provides a graph of the condition distribution of the whole of the Sealed Road Pavement assets. The report sheet is updated during the running of the Sealed Road Pavement file update from the run sheet of the St-Data file. The condition distribution also represents the starting point for the modelling process within the Moloney Modelling system.

Generally for assets constructed over a long period of time and with long life cycles the shape of this graph will be a normal distribution as illustrated in Figure 1 below. If the shape of the graph looks questionable, then you should satisfy yourself that the reasons for your particular shape are correct.

SEALED RD PAVEMENT PRESENT CONDITION DISTRIBUTION BY % OF ASSET BASE

	0	1	2	3	4	5	6	7	8	9	10
% Value Within Cond.	0.09	0.82	5.05	16.48	27.56	29.25	16.18	2.95	1.19	0.42	0.00

0 Good - Condition - 10 Poor
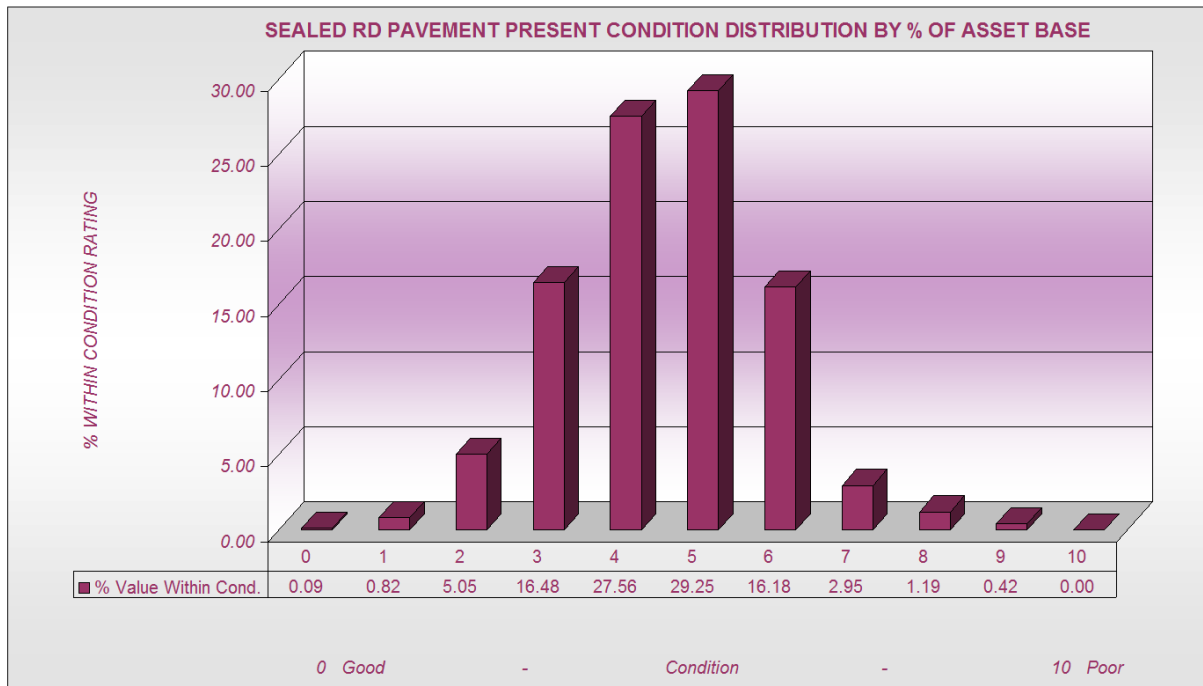
Fig. 1 Condition distribution Graph

2.8 Summary of maintenance standard condition reports within the Condition Sheet

All of the available maintenance reports will come form either of the following 2 sheets

- Condition Sheet
- Isolated Failures Sheet

2.8.1 Condition Sheet Reports

The Initial Condition sheet delivers all sealed road pavement segments in their raw program condition order from worst to best. The program condition within column AB of the condition sheet is derived from a consideration of the 3 shape characteristics in columns AG - AI combined with the extent of any pavement failures within columns AD + AE. For more detail of the formulae used go to Section 4.3 of our Roads manual or view the actual formulae used within cell EJ11 of the "Master Sheet" of the St-Data2 file.

This initial report could be seen as the first draft of the sealed road pavement rehabilitation program in priority order based on absolute condition - worst to best

2.8.1.1 Condition Sheet - Some modifications to initial report.

There are some recommended modifications to the initial pavement condition report sheet that you should consider. Some are extremely important like the road hierarchy weightings and others less important. Detailed below are some recommended modifications to the initial Condition sheet report.

1. Modify Program condition for Hierarchy weightings. This allows you to place say a 20% weighting on your link roads and a 10% on the collectors. A link road in condition 6.8 would then rise up to above condition 8.0. - Refer to roads manual for more details. The weighting is applied via the unique Moloney drop down menu within the Pave_2 file. But you MUST have the hierarchy recorded on all road segments and the weightings present within the codes sheet.

2. Remove any segment that you may have resealed within the last 2 - 3 years to avoid criticism of miss-management.

3. Be aware of other potential developments that may impact on the road and remove if necessary.

4. You can create different unit rates and codes for particular projects that you know will not be covered by the standard Code costing. This is done within the Codes and Valuation sheets before re running the Condition sheet again. Remember changes within a sub asset file make no difference to your base information within the St-Data2 file. You would normally undertake these operations within a copy of the "Pave_2" file that you have stored within a new folder. You need to maintain the file name, but the folder could be called "2022 Sealed Rd rehabilitation 5 year program".

5. You can amend the Seal width to a wider or narrower seal if you know the planned works will be different to the existing. This is again done within the Valuation sheet in columns BC - BE, before you re run the condition sheet. Best to also place a comment within Column BB or BH to record your actions.

6. You can delete as many rows of data within the Condition sheet as you like, to get down to your proposed 5 - 10 years recommended works program.

IMPORTANT NOTES:

- Remember to save your amended "Pave_2" file within a folder that is clearly identified as your planned sealed pavement rehabilitation program.

- The flow of data from the ST-Data2 file to the Pave_2 file initially populates the Codes sheet and the Valuation sheet within the Pave_2 file. You can undertake the amendments in 4 and 5 above within the Valuation and Codes Sheets of the Pave_2 file without reference to the original St Data2 file and then update the condition sheet within the file. This avoids any potential problems of contamination data in the original St Data2 file.

- When undertaking manual sorts and filtering on any Moloney sheet the sheets are all initially set up for A4 printing and as such can have as many as 4 - 5 timed the number of hidden columns, some of which could be of great interest to you. On all Moloney report sheets you can unhide all columns with a "Ctrl Shift D" command.

2.8.1.2 Condition Sheet - Delivering Other specific reports

There are two additional fields within the Formation section of the Condition sheet that may be of considerable use to you.

1. Column R of Condition Sheet - Shoulder condition and Shape - See section 4.3.61 in Roads manual

2. Column N of Condition Sheet - Longitudinal Drainage

3. Maintenance Grading report

No 1 deals with the paved shoulder area beyond the edge of seal. It may at first appear to have a strange condition range. It's range is from 11 to -10. It started out as a 0 - 10 range reporting the drop off from the edge of seal. Zero having no drop off and 10 having in excess on 75 mm. We then found in some instances there was a build up of material and grass within the shoulder that held water within the pavement area, so we created the -1 to -10 range in reverse. Then finally to cover the situation where there was no shoulder at all, we created a condition 11. Note also that you can use the Condition 1 - 10 range for situations of very steep cross fall that need imported pavement material to be brought in.

To use this condition indicator it is recommended that you commence with a new Condition sheet then do a "Ctrl x" to pick up all data for a manual sort and then sort on column R. At the completion of this process you would copy and save the sheet as an appropriately named file such as "Rural Shoulder condition June 2022 Survey". Again you can delete as many rows as you like within the sheet that will not be the subject of any works activities.

No 2 Deals with a single condition rating on a 0 - 5 scale for the condition of the longitudinal drains along the road. Do the same "Ctrl x" to pick up all data then sort of column "N".

IMPORTANT NOTE: You could go out and do a specific inspection for these 2 problems. If you are using our data be aware of the following.

- The date of the condition survey and if the fields have been updated since.

- If it is part of our normal sealed road survey our main effort goes into assessing the pavement and seal condition for each segment. The more you are diverted to assess additional details, the less accurate become the results for the main game. We tend to record these 2 condition factors when we get out of the vehicle to do our seal test and then modify it later if we see something different within the segment. Just be aware that it is not our prime focus and we may miss some problem areas. But it is a good place to start as if the assessment is poor then you can be fairly sure that the condition is correct.

No 3 Goes back to a time when we did not directly record all of the shape characteristics for unsealed roads. So we used a single 0 - 10 rating to record the need for maintenance grading. This has largely been superseded by the recording of the three shape characteristics of Roughness, Rutting and Profile for the unsealed roads.

To deliver a maintenance grading program for unsealed roads it is recommended that you go to the Condition sheet of the US Pave_2 file and first pick up all data for a manual sort with "Ctrl x" then sort into 2 different groups.

1. Requiring a deep rip and heavy grade - Sort for big numbers within columns AG - AI

2. Requiring a light grade - Sort for high numbers in Column AG and low numbers in AH and AI

Again you would save the 2 sheets once created with an appropriate name. But be aware that this report will be of use only for as long as you keep the data up to date. You could always make a copy of the data and do a maintenance grading inspection for this specific purpose. Not a bad operation to do on a very wet day when other activities are restricted.

2.9 Reports from the Isolated Failures sheet

The isolated failures sheet is designed to report on major and minor dig outs that are required that do not involve the full rehabilitation of a segment.

Within the sheet columns AD + AE contain the percentage of immediate and potential pavement failure that were observed during the survey. Column AF contains a code to identify the type of pavement failure present. Up to three types of pavement failure can be recorded each separated by a forward slash. For example you may have a code CC/PM this equated to crocodile cracking combined with pavement movement. The failure codes are all user definable but must be contained within Table C10 of the codes sheet. We have a series of standardized codes that you can use, or you can customize your own codes.

The sheet will generally be used in conjunction with a series of sorts, row deletions and filters to deliver the following reports.

1. Major patched program

2. Stitch in time patching on otherwise sound pavements.

2.9.1 Major patched program

You will need to set some parameters that guide you in the selection of this program. We have listed some matters for consideration but it will really be up to you to make these decisions based on your own local knowledge of pavement performance.

- The point at which you will not intervene to undertake major patches. This could be any pavement with a program condition within column AB that is greater than 7.0. These you would tend to maintain as best you

could under the normal maintenance program but not waste the funds to dig then out as the surrounding pavement areas are probably going to fail also. There you would place on the filters within the sheet with a "Ctrl e" and filter for 7.0 and greater within column AB then delete the rows.

- Next you may again place on the filters and filter for blanks or zeros within columns AD + AE (the segments with no failures at all) then delete these segments.

- From here it is really up to you as to how you proceed. But one important thing to understand is that like all report sheets within our system they are initially set up for A4 printing and have a lot of hidden columns. The initial isolated failures sheet has one A4 width but when all columns are un hidden this goes out to 4 sheets. Hence there are many more fields at your disposal for filtering.

2.9.1.1 Some matters you may wish to consider are listed below.

1. Just concentrate initially on the immediate failures.

2. Adopt some form of ranking system for each target project. I like to use one or two of the user definable columns such as columns V - X to report my urgency priority on a 1 - 10 or 1 - 5 scale and a code for why the segment has been included.

3. As an example of 2 above you may place a code (5+I/L) with an urgency 8 out of 10. The code stands for 5% and above immediate failure on a link road. A code 5+I/A on an access road may have an urgency of 6 instead of 8.

4. You may want to include some of the extensive potential failures on link and collector roads where the program condition is at 5 or below.

5. Be aware that it is often better to deal with an otherwise sound pavement with minor failures than a poor condition pavement with extensive failures.

6. We can't really provide you with a definitive answer for the delivery of the major patched program, but the system has the tools to assist you in this task.

7. Make sure you inspect all sites for verification before including them within your completed program.

8. Finally consult with maintenance staff to ensure their input is considered

3.0   The Unsealed Pavement file - UsPave_2

The standard reports within the unsealed pavement file are very similar to those within the sealed pavement file. When delivering a recommended re sheet program be aware of the following matters.

1. Any unsealed road pavement with a code classification of "Z" is intended as a formed only pavement with no imported pavement material. It's condition is generally based on the shape parameters. But even it there is pavement material present a decision has been made not to re sheet it and so all "Z" code pavements within column Y of the Condition sheet should be deleted before you commence sorting out the re sheet list.

2. Be sure to unhide all columns as per 2.8.1.1 above to enable sorting and filtering on all available information.

3. There is a depth of imported pavement material field within column AK of the condition sheet as well as a code to describe the nature of the material. For example a code CR/GS/NS indicates that there are 2 types of pavement material present. Crushed rock and granite sand with the final code "NS" telling you that the assessor considered that the Natural silty loam is assisting the imported pavement material and may have resulted in a better program condition than the strict link to pavement depth would normally allow. Refer to the roads manual for more detail.

4. The program condition for unsealed road pavements is as defined by the assessor in the field within the overall condition in column AC. For example if an unsealed pavement was designed to have a pavement depth of 100 mm (**P10** code pavement) and an inspection found that on average it had only 30 mm of pavement material then the condition of the pavement would be **Condition 7**. Similarly if a 200 mm design depth pavement was found to have only 50 mm of pavement material remaining then it's condition would be **Condition 7.5**

5. The code for the imported pavement material within Column AL should all be recorded within Table C11 of the codes sheet. There is a limit of three codes per record separated by a forward slash.

6. The roughness, Rutting and Profile fields for unsealed pavements have no bearing on the program pavement condition within column AB and are simply maintenance matters. They are generally used to deliver maintenance grading programs.

7. The Isolated failure sheet within the USPave_2 file is similar to that of the sealed road pavements accept that here we only record immediate failures. It is designed to deliver a spot patching and isolated pavement repair program.

8. The most typical modes of failure for an unsealed pavement are as detailed below and again you can record up to 3 types of failure separated by a forward slash.

   - B - Bare patch

   - W - Water Intrusion

   - WW - Water washing

   - POT - Pot Holeing

   - LF - Loss of fines

   - LM - Loose material

The variables within the data set are quite extensive for unsealed roads if the survey has been properly undertaken. We have no set recommendation for the re sheet program. This will be up to council and will include a high extent of local knowledge. But there is a lot of information to get you started.

Similarly for the isolated unsealed pavement repairs which can be even more complex, our aim is to provide you with the information that you can add to with local knowledge to prepare a recommended unsealed patching program.

4.0 The Sealed Surface file

The sealed surface file "Seal_2" is again very similar in set up to the "Pave_2" file. There is no "Isolated Failures" sheet within the file as this is dealt with within the sealed road pavement file.

4.1 Development of a Draft reseal Program

The main report that is derived from the "Seal_2" file is the first draft of the Re Seal program. We have included below a method for the development of a draft re seal program which you may wish to consider.

4.1.1 Preliminary Notes

This set of procedures assumes a certain basic knowledge of the Moloney Roads software as well as an intermediate understanding of Excel operations and does not fully describe all operations step by step. Refer to Moloney Road asset Manuals if you need additional information or give us a call.

Preliminary Work with the data set

1. Be sure that you are accessing the correct St Data2 file and not an old out of date data set.

2. Ensure that all recent reseals have been updated within the St-Data2 file so that they won't come up as a high reseal priority. A simple zero for all seal condition ratings within St Data 2 will fix this.

3. Ensure that the unit renewal rates on the "Codes" sheet within the "St-Data2" file are up to date and reflect the current cost of reseals. If amending them you may wish to create a copy of the Moloney files and place them into a folder within the "Working" directory away from the "Current" assets directory to avoid any future valuation problems. A copy of the files for this process is strongly recommended.

4. Use the "Post Data Entry Validation" process from the Moloney "Roads" menu to validate all data within the Master Sheet of the "St-Data2" File and fix any errors. If only working on the re seal program you could limit the "Post Data entry Validation" to "6. Test Sealed Surface Fields".

5. Update the Seal_2 sub asset file from the "Run" sheet of the St-Data2 file

6. Within the "Condition" Sheet unite adjacent seal segments with the same existing and proposed next treatments. This is done off the Moloney "Seal" menu within that file, from the "Condition Sheet" program options - "4 Unite Street segments by condition". This will unite consecutive segments with the same existing and proposed treatments that have a program Condition within 0.5 of each other into a single project.

7. Again from the Moloney "Seal" Menu on the "Condition" Sheet, apply the road hierarchy weightings to the road network to give the more important roads a higher program condition. You will need to have your road hierarchy defined within column HC of the master sheet as well as the weightings you want defined within Table C12 of the Codes Sheet. If you don't have your hierarchy in place you cannot use this weighting facility, but it is considered very sound practice to be able to apply the hierarchy weightings.

4.1.2 Setting up the draft Re Seal Program and recording priority and reasons for inclusion

1. You should now have an up to date "Seal_2" File that is ready for the creation of the draft reseal program.

2. Remember the "Seal_2" file is just a program file that holds no unique data. It can be amended as required including the deletion of Columns and rows and can always be generated again off the Moloney "Seal" menu within the file. It is generated from the data within the "Valuation" sheet so you don't need to run it all again from St Data2.

3. It is recommended that you set up three of the user defined columns within the "Condition" Sheet of the "Seal_2" file to flag reasons for inclusions and rejections as well as priority ranking for the reseal program. I tend to use Column AG for my Reseal ranking 0 - 10. Column AH for the reason a segment is excluded from the program and Column AI for the reason for inclusion into the reseal program. Remember a "Ctrl Shift D" operation will unhide all columns within the "Condition" Sheet and you can colour and rename the headings within Columns AG - AI

4. Even if you have used these columns for some other purpose in the Master Sheet, as long as you don't need that data to develop the reseal program overriding the data here will not result in it's ultimate loss.

4.1.3 Setting Re Seal Priorities 0 - 10 and the reasons for inclusion in the program

1. This operation is carried out within the "Condition" sheet of the "Seal_2" File. Note that this file contains no original data and can be amended at will and then regenerated via the Moloney menu program. If at any time through this process you wish to start again simply generate an updated "Condition" Sheet off the Moloney "Seal" menu within the file. (No need to return to St Data2)

2. Within the heading rows 18 - 21 in Columns AG - AI place the following or similar headings. AG - Priority reseal ranking. AH - Reason for exclusion from reseal program. AI - Reason for inclusion within the reseal program.

3. Began by excluding Poor condition Pavements that you will not be resealing because the pavement condition is too poor. Within the "Condition" Sheet do a "Ctrl Shift D" to display all hidden columns. Then do a "Ctrl e" to put on the filters. Next filter on the program pavement conditions in column K as greater than say Condition 7.5. Within the user definable column AH place a reason for exclusion into the appropriate filtered cells below row 21 as "Poor pavement Cond 7.5+" (or use a code PPC7.5+) and into Column AG place a 0 (Reseal priority 0)

4. Next rank the Primer Seals if you have any. Do a "Ctrl e" to remove the filters and another one to put them back on again. Then selected all Primer Seals (Code Starts with PS in Column AK). This will only work if you have a unique seal code for all Primer Seals. Do a second filtering of the Primer seals on Column "V" for seal program condition >= 5.0. Rank the urgency in Column AG as 10 and the reason for inclusion within column AI as "Primer seal in Poor condition" or (PSP)

5. Repeat step 4 with the program condition set to < 5 and then set urgency to 6 and reason for inclusion to "Primer seal Moderate condition"

6. Take the filters off with a "Ctrl e" and then put them on again with a 'Ctrl e". Then use the filters to hide the segments that you have already ranked within columns AH + AI (filter for blanks in these columns). Then select all oxidized 5.0 segments within column Z and then place a comment into column AI "Oxidises 5.0" and an urgency within AG as 10

7. Repeat step 6 for the oxidized 4.5 seals and place a comment "oxidized 4.5" into Column AI. And Urgency 8 within Column AG.

8. Continue the above process using the filters to isolate the sub sets of the data that you wish to rank and placing comments into columns AH and AI and Urgency rankings into AG. Some suggested rankings are listed below for the filtered data. But it is really up to you to choose your urgency ratings and you MUST also take into account the time since the roads were condition rated. We have listed below some suggested urgency rankings for various situations.

    - 10 - Poor condition Primer seals

    - 8 - Moderate condition Primer seals

    - 6 - All Other Primer seals

    - 10 - Oxidizes 5

    - 8 - Oxidized 4.5

    - 10 - Seal Program condition in Column V - 8 +

    - 9 - Seal Program condition 7.5 - 8

    - 8 - Seal Program condition 7.0 - 7.5

    - 7 - Seal Program Condition 6.5 - 7.0

    - 6 - Severe cracking and moderate program condition

    - 0 - Very poor condition pavements that you will not reseal because of poor pavement condition

    - 0 - Seal program condition 0 - 1

    - 4 - Seal program condition 4 - 5

TIP: While undertaking the above filtering and nominating what is in and out of the program it is strongly advised that you set up the sheet in the following way.

1. Set up the freeze panes at Cell D22 or G22. This can be done using the Moloney Short Cut key operation of "Ctrl Shift E" or undertaken manually.

2. When filtering keep your eye on cells B14 and B15 to view the extent of the filtered data and if not as expected take off the filters "Ctrl e" and re do the filtering. Work by the old adage (If it looks wrong it probably is).

4.1.4 Setting up and reviewing the planned re seal program

1. With all rankings in place sort by descending ranking in column AG and then look at the cumulative reseal cost in Column BS. Run down till the total cost is around 30% more than your planned budget and flag these segments for inspection by shading these lines of data or otherwise identifying them.

2. If you have deleted rows you may need to reset the cumulative cost in column BS off the Moloney drop down menu for the Condition sheet.

3. Re-sort the whole data set into alphabetic and running chainage order (See Moloney Seal Menu Item for this) and run down the data set to see if it would be worth adding in any adjacent segments that are close to needing a reseal. Flag then as being included in Column AI as "Adjacent and Close cond" and give the segment the same urgency rating as the main segment that is already in your program.

4. You may wish to minimize the number of segments you are looking at in the sheet by filtering out or deleting the good condition seals that will not be resealed over the next few years.

5. With this done sorted the whole data set based first on the Reseal Urgency ranking in Column AG. Then the road name and finally the running chainage.

6. Then set up a cumulative reseal cost in column BS (can be done off the Moloney "Seal" menu).

7. Print out the draft reseal list and go on site to check the draft reseal program and make the final selection for inclusion or rejection.

8. Ensure that your senior maintenance staff have the opportunity to review the list and make suggestions for additional work or removal of segments.

4.1.5 Final Reseal Program Comments

1. There are a number of program functions built into the Moloney software that can greatly assist you with the above process. It would be advisable to understand what is available to you to assist with the preparation of this and other capital works programs.

2. See Appendix A for the details of all short cut key operations that we have programmed into the system and try to remember them, they will save you a lot of time in the long run.

3. The above reseal program set up should be seen as an example only. It is one way that you could approach the task. You may have other considerations and other priorities. The main purpose in presenting it is to provide you with a template for how to go about it. The ideas and methods will hold true for you if you combine it with some of your own ideas.

Final Very Important Consideration: Please be sure to also consult with the maintenance staff that do the seal patching and the maintenance area supervisors and inspectors. These are people that are out and about on your sealed road network all year round. An external condition inspection is of great value but it is undertaken only once every 3 - 5 years so it does have it's limitations as well as it's strengths. Your regular staff can be a valuable source for adding in segments that are not performing well and removing segments that are holding up better than expected.

4.2 Other Reports within the Seal File

There are 4 standard sorts of the data within the Condition sheet that can be accessed off the Moloney "Condition" Sheet drop down menu. The reports are as detailed below.

1. Seal Cracking Condition Report

2. Seal Stripping Report

3. Seal Oxidation Report

4. Seal Edge break Report

The main reports would be the crack condition report which sorts the data first by cracking extent and then by severity. It may however be more useful to do a manual sort and reverse the order, as it is probably the severity that is the more important parameter.

The seal stripping report and the edge break report could also be of use.

There are two other reports that are on the main Seal menu. One allows you to include the Conservation value in the seal report sheet if you have it included. This could be very helpful in avoiding unwanted damage to high conservation value road reserves during the re seal works.

The other report allows to adjust the program condition for the road hierarchy weightings so that more weighting can be attached to your more important roads (However we have mentioned this one above and it would normally be activated at a very early stage in the development of the re seal program).

5.0 The Kerb File (Kerb_2 File)

Again this file has essentially the same set up as the Pave_2 file

5.1   The Kerb Condition Sheet

The completed condition sheet provides the first draft of a kerb replacement program. However you would normally undertake full kerb replacements in conjunction with town street reconstructions. Unfortunately there is no pavement condition information within the kerb file. So if you need to consider the sealed pavement condition in conjunction with a kerb replacement program (which you should) you would need to undertake a temporary copy of the sealed pavement condition rating to a field that is copied to the Kerk_2 file.

There are no specific "User defined" Fields within the Master sheet of St Data2 that are transferred to the Kerb_2 File. So what you would need to do is use one of the named fields such as the 3 map reference fields within columns HH - HJ on the master sheet. These get delivered to Columns AI - AK on the Condition sheet of the Kerb_2 file.

Remember that even if these fields contain data that you need you could create a full copy of the Roads files in a separate folder named something like "Proposed kerb renewals 2022" and then place your workings within columns HH - HJ on the "Master Sheet" of the St Data2 file. Then provided you did not need the map reference details within the kerb file all would be fine.

5.1.1   Setting Kerb replacement priorities

As detailed above if you need to consider pavement condition (which you really do) then unfortunately you would need to copy the program pavement condition within column EJ on the master Sheet into a column that will be transfused to the Kerb_2 file such as column HH. Then run the kerb update report from the "Run" sheet of the St Data2 file and Column AI within the "Condition" sheet of the Kerb_2 file will then have the pavement condition for each piece of kerb.

From here you might want to set up the filters on the Condition sheet with a "Ctrl e" and filter first on column J of the "Condition" sheet for kerbs with condition 7.0 and higher. Then filter on Column "AI" for Pavement condition better than or equal to say condition 5.

You will then display all of the kerbs that are at and above condition 7 where the pavement is better than or equal to condition 5 and hence you have your first draft for a kerb replacement program.

5.2   The Kerb Isolated Failures Sheet

This sheet is very similar to the "Isolated Failures" sheet within the Pave_2 file. But here the extent of the isolated kerb failure is reported in lineal metres within Column K combined with an urgency rating within column L. The urgency rating commences at 0 where there is very little impact from the kerb failure up to 3 where the impact on the pavement is severe.

5.2.1   Setting up the Kerb isolated failure repair program

This is done within the "Isolated fail" sheet within the Kerb_2 file. If you have done the transfer of the program pavement condition as referred to in 5.1.1 above it will also be present within the "Isolated Fail" Sheet within column AI.

There are two areas of kerb failure that you probably want to ignore.

- Where the program pavement condition is poor

- Where the overall condition of the kerb is poor

To eliminate these pieces of kerb failure. First put on the Autofilters with a "Ctrl e" on the Isolated Fail sheet. Then filter on the program pavement condition in column AI for pavement values greater than or equal to 7. Then place on a second cumulative filter in column J for kerb conditions greater than or equal to 7. Next pick up the filtered rows and delete them. Alternately you could have excluded then in the sort process and not deleted.

Now you have a list of all isolated kerb failures where the kerb condition and the adjacent pavement condition is better than 7.0. You can sort this by risk factor severity in column L off the Moloney unique menu or manually. Remember you can pick up all data on any Moloney data sheet with a "Ctrl x" and then do a manual sort.

There may be other locality priority considerations that you need to deal with. This can be done in much the same way as we did above for the re seal program by creating a unique internal ranking based on such matters as, urgency in column L, town name in column Y and locality in column X. You can either use one of the existing empty columns for recording your workings or do an off side calculation in the blank columns starting at Column AS.

Remember the Autofilters can be placed on and off with a "Ctrl e" and all data can be picked up for a manual sort with a "Ctrl x".

Flag what you want in the program and you can then delete the unwanted rows.

6.0   The Footpath File (Footpath_2 File)

This file has essentially the same set up as the Pave_2 file

6.1   The Footpath Condition Sheet

The completed condition sheet provides the first draft of a Footpath replacement program.

It is recommended that you create a copy of the St Data2 and Footph_2 files in a separate folder named something like "Proposed Footpath renewals 2022" and then undertake your workings within the "Condition sheet of the Footph_2 file.

6.1.1   Setting Footpath replacement priorities

While the set up and operation of the Kerb_2 file is very similar to that of the Footph_2 file there is an important point of difference with the two sub asset classes. The footpath assets do not relate at all to the road hierarchy. The software has capacity for a separate footpath hierarchy. The code for the footpath hierarchy is placed within column AQ of the "Master Sheet" within the ST Data2 file. Then all codes and descriptors used must be placed within Table C15 of the Codes Sheet in the same file.

Against each footpath hierarchy code there is the opportunity to place a weighting linked to the asset condition and the same or a different one for the isolated repair work. For example you may identify a footpath code to be used in high traffic areas close to a hospital or school and give it a substantial weighting for both asset condition and isolated failure repair.

With all footpath segments in the master sheet assigned a footpath hierarchy and the hierarchy's all recorded within table C15 of the codes sheet with their assigned weightings for each independent hierarchy you then go to the run sheet of the St Data2 file and nominate a "Y" within cell I5 then run the program update from the "Roads" unique Menu.

With the footpath file run go to the "Condition" sheet. It will be in raw absolute condition order within column L. To allow for the hierarchy weightings within the condition sheet do a "Ctrl x" to pick up all data then sort based on column K descending. You now have a priority footpath replacement program with allowances for footpath hierarchy.

You can still continue on using the sorts, filters and deleting rows until you arrive at your preferred footpath replacement program.

Remember also that if you delete a row you will need to update the cumulative replacement value in column BL. This can be done by copy and paste of a correct formulae or off the Moloney unique Footpath drop down menu.

6.2   The Footpath Isolated Failures Sheet

This sheet is very similar to the "Isolated Failures" sheet within the Pave_2 file. But like the condition sheet above the "Isolated Fail" sheet also has capacity to apply hierarchy weightings to the failure repair work.

With the footpath file run go to the "Isolated Fail" sheet. It will be in raw absolute urgency order within column N. To allow for the hierarchy weightings within the sheet do a "Ctrl x" to pick up all data then sort based on column O descending. You now have a priority footpath repair program with allowances for footpath hierarchy.

You can still continue on using the sorts, filters and deleting rows until you arrive at your preferred footpath repair program.

Remember also that if you delete a row you will need to update the cumulative replacement value in column BO. This can be done by copy and paste of an existing correct formulae or off the Moloney unique Footpath drop down menu.

Now you have a list of all isolated kerb failures where the kerb condition and the adjacent pavement condition is better than 7.0. You can sort this by risk factor severity in column L off the Moloney unique menu or manually. Remember you can pick up all data on any Moloney data sheet with a "Ctrl x" and then do a manual sort.

There may be other locality priority considerations that you need to deal with. This can be done in much the same way as we did above for the re seal program by creating a unique internal ranking based on such matters as, urgency in column O, town name in column AD and locality in column AC. You can either use one of the existing empty columns for recording your workings or do an off side calculation in the blank columns starting at Column BP.

Remember the Autofilters can be placed on and off with a "Ctrl e" and all data can be picked up for a manual sort with a "Ctrl x".

Flag what you want in the program and you can then delete the unwanted rows.

Appendix A - Summary of Moloney Short Cut Key Operations

Description of Function	Short Cut		Applicable to
Protect the active Sheet	Ctrl Shift	"P"	Any Sheet
Unprotect the active sheet	Ctrl Shift	"U"	Any Sheet
Set up and then remove the autofilters on row 21 only	Ctrl	"e"	Start at Row 22
Freeze the panes at row 22	Ctrl Shift	"E"	Start at Row 22
Remove the Freeze the panes at row 22	Ctrl Shift	"R"	Any Sheet
Select all Cells below Row 22 for a manual Sort of Data	Ctrl	"x"	Start at Row 22
Display all Hidden Columns in a worksheet	Ctrl Shift	"D'	Any Sheet
Paste Special "Values only" after copying something	Ctrl	"q"	Any Sheet
Display the hidden copy block on the Master Sheet	Ctrl Shift	"H"	Master Sheet
Hide the hidden copy block on the Master Sheet	Ctrl	"h"	Master Sheet
Standard Excel Short cut - "Copy"	Ctrl	"c"	Any sheet
Standard Excel Short cut - "Paste" - Pastes all inc formatting	Ctrl	"v"	Any Sheet

Note: The Moloney standard shortcut operations can be used on any sheet in any file (even non Moloney files) provided you have a Moloney file open that has the program capacity built in.

Word of Caution : Sometimes when you have more than 1 Moloney file open you can have trouble with the short cut keys

Appendix B - The Data Recollection sheet in St Data2

There is a sheet within the St Data2 file called the "Data Recollection". The idea of the sheet is to enable you to set up your existing data set in a way that will make it easy to work with in the field and to later update the data set in the office.

Some say that you are better to update the data set in the field directly into a tablet or computer. That is fine if it works for you. But after 27 years of doing nothing but this work we find it is far quicker in the field to update onto a paper print out and to then use that information to update your data set within the office. Our experience is that we are around 2.0 - 2.5 times quicker onto paper than into a tablet.

The main feature of the data recollection sheet is it's formatting. We have written a program that formats the data set so that there are heavy horizontal lines between different road and street names as well heavy vertical lines between different logical groupings of the data. In this way it becomes far easier both in the field to record the data changes and in the office to update the data set.

We recommend that you set up the data recollection sheet at around 32 points in row height to allow room below the printed data for updates. Then when you are updating into the Master Sheet one of the formatting options on the Master sheet is to create the same formatting as the Data Recollection sheet. Just be sure the sorting is the same and then your printed data recollection sheets can be set to exactly the same format as the Master Sheet. We find somewhere between 16 and 19 Points on the Height of the rows on the Master sheet generally matches up. If you match it up exactly, with a little trial and error, then your page up and page down keyboard strokes will smoothly move you between the hard copy pages from the Data Recollection Sheet.

Data Recollection Sheet Formatted for - Footpath Collection

| Seg I.D. No. | ROAD OR STREET NAME | SEGMENT DETAIL | | | | FOOTPATH LEFT SIDE | | | | | | | | | | | Footpath General | Township Name |
| | | FROM | | TO | | Footpath over full segment | | | | | | Isolated Footpath | | | | | Comments | |
		Street Name or Description	Dist. m	Street Name or Description	Dist. m	Code Type	Wid m	Add Sub	Cond 0-10	Iso Fail	Urg 0-3	Code Type	Leng m	Wid m	Cond 0-10	Iso Fail	Urg 0-3	Relating To Footpath	Blanks are Rural
52	Alexander Av	Victoria St	0	Morris St	247	AS	1.20	-3	0	2	2								Town A
53	Alexander Av	Morris St	247	Church St	446	AS	1.20	0	0			C100	80	2.20	5				Town A
74	Anderson Rd	Calder Hwy	0	Taverner St	158	C100	1.50	-3	2										Town A
75	Anderson Rd	Taverner St	158	Victoria St	391	C100	1.50	0	2										Town A
76	Anderson Rd	Victoria St	391	Warne St	734	C100	1.50	0	2										Town A
77	Anderson Rd	Warne St	734	100 km Sign Berriwillock	752	C100	1.50	-3	3										Town A
78	Anderson Rd Memorial Turn	Anderson Rd	0	Taverner St	45	C100	1.80	2	7	10	3								Town A

Figure B1 Sample of part of a Data Recollection Sheet

Figure B1 above has been set up for the re-collection of footpath information. Normally there would be the details relating to the right footpath included on the sheet. We left these off simply to reduce the width of the figure. Our normal practice is to print at A3 and in land scale mode. In this way you can get a lot of information onto the sheet.

Note the hard lines between individual road names and the heavy lines between data groups. This makes it very simple and accurate to both amend the data in the field and to update the data into the computer with an exact copy of the data collection sheet within the Master Sheet where you update.

B1.1 A Suggested practical use of the facility

Within Section 2.8.1.2 above we demonstrated the details relating to two important condition factors.

- The longitudinal drainage condition of the road

- The drop off from the edge of seal in the rural areas where attention is periodically required.

It is suggested that this is something council could update themselves at regular intervals on days when their operational staff are hindered because of wet weather. This would be of great benefit in the development of these two

programs and would provide a practical use for existing resources. Remember you could filter out sub sets of the data within the Data Recollection sheet for the various maintenance areas.

Appendix C - Updating the data set with Capital works

It is really important to keep the data set up to date with capital works activities. This is even more important if you have chosen to deliver your written down value (WDV) based on the age of the assets. We have created a sheet within the St Data2 file that summarizes the recommended amendments that you should make to the data set following capital works upgrades. This sheet is called - **Capital Works - Update Fields**.

Essential fields Replacement Asset						Essential fields New Asset							
M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
FOOTPATH LEFT SIDE													
Footpath over full segment							Isolated Footpath						
Code Type	Wid m	Add Sub	Cond 0-10	Iso Fail	Urg 0-3	Const Date	Code Type	Leng m	Wid m	Cond 0-10	Iso Fail	Urg 0-3	Const Date
Row 23 was the existing record within the data set													
AS	1.50	-5	**8**	20	3								
Row 25 is the recommended details for the updated asset													
C75	1.20	-5	**0**			1-Jan-11	AS	50	2.50	**0**			Feb-11

Columns M - S contain the details of a new piece of replacement footpath NOTE:
1. Code Changed from AS (Asphalt) to C75 Concrete
2. Condition Amended from 8 back to a new condition 0
3. Isolated Failures removed
4. Construction date entered

Columns T - Z contain the details of a new piece of additional footpath NOTE:
1. Code is AS (Asphalt)
2. condition 0
3. Isolated Failures blank
4. Construction date entered

Figure C1 Details of the Left Footpath update requirements -

Figure C1 contains the details of the fields to be updated following a footpath replacement and the addition of a new footpath. On the left overall section we have replaced an existing asphalt footpath that was placed in Jan 1999 with a new 100 mm deep reinforced concrete footpath placed in May 2022. Note that the condition in column P has been put back to zero and the 20 metres of isolated failure removed. It is also really important to record the date of the upgrade to the nearest month.

There was also a new piece of asphalt footpath placed on the same side. To accommodate a second piece of footpath on the same side we need to use the "Isolated Footpath" record area. Here 50 m of asphalt footpath was placed in Feb 2022 and it too has a condition of zero.

We have provided this example of footpath capital works as an illustration of how to use the "Capital Works - Upgrade Field" Sheet. The fields to be amended are shaded with and olive green tint and the same format is used for all other assets within the "Master Sheet". Please remember that all amendments to capital works within the roads module are undertaken within the "Master Sheet".

The "Capital Works - Upgrade Fields" sheet also has a detailed excel comment for every field within the Master Sheet (on row 10) as well as the comments below the table to assist you.