Moloney AM Systems

Manual of operations for

Roads and Streets Module

In MS-Excel Format

Manual last updated 19/11/2021

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1. Introduction:

This manual covers the “Roads and Streets Module” of the Moloney asset management system in it’s MS-Excel format. In addition to the roads module the Moloney system also has modules available for most other council asset groups. The system is designed as a technical system for the delivery of practical asset management and accounting reports as well as a register containing the capital information relating to the assets.

The Moloney Asset Management System is a very easy to use and highly adaptable MS-Excel based system. Data is input into a Data Retention File and from there a number of Visual Basic Programs generate accounting and management reports that are contained mostly within other files.

There is now available a Microsoft SQL version of the Roads software which was developed for the RoadAsyst MIM (Maintenance and Inspection Module) by Pitt and Sherry. The RoadAsyst software is designed to manage the maintenance and inspection systems associated with the road assets but it is also capable of housing the Capital asset information that sits within the Moloney MS-Excel program.

SQL becomes the warehouse for the data and it is exported to the MS-Excel program to provide a full range of the existing Moloney Reports. In this way you get the security of the SQL data base environment combined with the flexibility and ease of the MS-Excel system.

One of the great strengths of the system is its overall simplicity. This coupled with the fact that the end user needs only basic MS-Excel skills in order to master the system means that you will be able to get result very quickly. A more advanced understanding of MS-Excel operations will enable the user to take the basic reports provided and operate upon them to produce new site-specific reports to cater for local requirements.

Additional reports can be programmed into the system relatively inexpensively to meet a particular demand. But often this will not be necessary, as even a basic MS-Excel user will find that they can amend the existing reports manually to produce a variety of new outputs.

1.1 Roads Module Set up

This section will deal with the basic set up of the Moloney MS-Excel Roads Module.

1.1.1 Sub Asset Groups Covered

The Roads & Streets module of the Moloney Asset Management System is comprised of the following sub asset components

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

The system consists of a series of MS-Excel files, which interact to provide a complete asset register and capital management system. The system is too extensive to be contained within the single MS-Excel file so a series of files has been used. The Files within the system along with a brief description of their function is detailed below.

1.1.2 Files within the Moloney MS-Excel roads module

The Moloney Asset Management System contains the following MS-Excel Files

File Name	Function and Description
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,
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.
Kerb_2	The second road sub asset file dealing with kerb assets
Pave_2	The third road sub asset file dealing with Sealed Road Pavement assets
Uspave_2	The forth road sub asset file dealing with Unsealed Road Pavement assets
Seal_2	The fifth road sub asset file dealing with Sealed Surface assets
StFurn_2	The sixth road sub asset file dealing with Street Furniture assets
Trees_2	The seventh road sub asset file dealing with Street Tree assets
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
AccountBetweenSurveys 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.

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.

1.1.3 Primary Functions and Objectives

The primary function is the provision of a flexible and easy to use management tool for infrastructure authorities and managers that will enable them to.

Manage their infrastructure assets in a cost effective manor.

Prepare annual budgetary submissions based upon the real needs of the network.

Produce an open and easily understood means of complying with accounting regulations.

Benchmark the Infrastructure asset condition at a particular point in time for comparison with the same asset base at a future Date.

Adapt the basic data input and reports that are produced to meet the specific needs of their organization.

Document risk management procedures associated with infrastructure assets.

Enable future financial modelling of road infrastructure network.

2.0 SYSTEM SET UP:

The system is best thought of as a series of MS-Excel files comprising 4 parts.

Part one	Data base and data entry section
Part two	Sub asset file reporting section
Part three	Financial modelling section
Part four	Auxiliary functions

2.1 System Part 1 - Data Base Section:

Data is collected and input into a data storage file called the **"ST-DATA2" File**. This file is used to store all road & street related asset data. It is from this file that all other files within the roads system draw data for the production of their reports. No other file within the system contains any original data. The file also contains a variety of overall valuation and road name reports.

The St-Data2 file is the file from where you activate the transfer of data to the sub asset report files.

2.1.1 St-Data2 File – Data Base - Functions

The data base section of the program is made up of the single file called St-Data2. It is used for the following functions.

- Input and store all original Capital road asset details such as quantities and condition
- Record all unit rate code details for asset valuation purposes.
- Run all sub asset file reports from this file
- Provide a road register
- Record the overall sub asset valuations following the running of the sub asset report files
- Assist with basic queries into the road assets.

2.2 System Part 2 – Sub Asset Reporting section:

Road assets are broken down into 7 sub asset categories as listed within section 1.1.1 above. Each of the seven sub asset groups then has a separate file. These sub asset files are programmed to extract the required data from the "St-Data2" File and to operate on that data to produce both valuation and management reports.

The sub asset reports provide full valuation information down to road segment level. They also contain a wealth of engineering and management reports.

2.2.1 Files associated with the Sub Asset reporting section

- Footpath_2
- Kerb_2
- Pave_2
- UsPave_2
- Seal_2
- StFurn_2
- Trees_2

2.2.2 Function of the Sub asset section

- The sub asset section of the program is used for the following functions.

Produce the asset valuation reports.

Provide a range of engineering and management reports.

Assist with the preparation of works programs.

- No unique or original data is contained within the sub asset files. They draw all of their data from the St-Data2 file. Thus they can be modified at will and regenerated in their original form at any time.

2.3 System Part 3 - Financial Modelling Section

One of the key requirements to sound asset management is the ability to predict future financial demand. The Moloney financial modelling module is linked to the Roads module and provides predictive modelling relating to.

- Future renewal demand based on a desired condition outcome
- Future asset condition based on a proposed renewal expenditure profile
- Both models also can track the movement in future maintenance demand.

The modelling module is sometimes called the “Renewal Gap Model” and further details of its operation can be obtained from our web site with a downloadable Modelling manual and other information.

2.4 System Part 4 – Auxiliary Functions:

There are 2 auxiliary functions associated with the roads module listed below.

- Backup
- AccountBetweenSurveys3

2.4.1 Backup File

This file is used as a backup for all of the variable data within the St-data file. It is accessed from the Main menu within the St-Dat2 file and can be operated in either direction. That is data can be sent to Backup from St-Data2 or data can be brought back to St-Data2 from Backup.

The file serves 2 main functions. It can be used as a backup system for the St-Data2 file. It is also used as a means of transferring data from an old to a new St-Data2 file when program upgrades are installed.

2.4.4 AccountBetweenSurveys3 File

A file used for accounting purposes to allow for the tracking of cash expenditure on a whole of asset group basis so that overall financial figures will reconcile with cash expenditure for the period between full asset condition surveys. The idea of the file is that a survey of the assets combined with a review of unit rates delivers replacement value, written down value and annual depreciation as at the time of the survey. From here the Account Between Surveys 3 file produces those same 3 figures in future years allowing for cash going into the assets and depreciation coming out.

3.0 Standard Reports:

The MS-Excel road and streets module has a number of standard reports. The Reports within the system are listed below within their File Locations.

3.1 St-Data2 File Reports:

Road Register Segment Detail report. Lists all road and Street segments

Road Register Report. Lists all Roads & Streets as one line entries other than where a single road is within more than one road register class

Road lengths Report. Provides a summary of the overall Road & Street lengths within the six designated categories of road status.

Road condition report. Provides a graphical representation of the condition of a nominated road for each of its sub assets.

Data Recollection Report. Formats the existing data within the system for the second and subsequent recollection of Data. Summary of the overall asset valuation situation for all road related assets.

Class Valuation Report. Which is a summary of the valuations and quantities of each type of sub asset within all sub asset groups (eg all of the concrete Footpaths and all of the Brick paved footpaths etc.)

Invalid Entries report listing all invalid data entries contained within the main database.

Summary of overall asset valuations for the whole roads module.

3.2 Footpaths - Footph-2 File:

Valuation Report providing details of Replacement Value, Written Down Value and Depreciation for each element of footpath within the file.

Footpath Condition report with footpath segments of all types placed into their condition order.

Footpath Condition report broken up into the various types of footpaths and then into condition.

Isolated Failures Report detailing locations of all footpath Isolated failures and the cost of repair.

Footpath Condition Distribution graph

3.3 Kerbs - Kerb-2 File:

Valuation Report providing details of Replacement Value, Written Down Value and Depreciation for each Kerb segment within the file.

Kerb Condition report with all Kerb segments of all types placed into their condition order.

Kerb Condition report broken up into the various types of Kerb and then into condition.

Isolated Failures Report detailing locations of all Kerb Isolated failures and the cost of repair.

Kerb Liability report, which allows you to cost future works proposals based upon a proposed configuration rather than a duplication of the existing

Kerb Condition Distribution Graph

3.4 Street Furniture - Stfurn-2 File:

Valuation Report providing details of Replacement Value, Written Down Value and Depreciation for each item of Street Furniture within the System.

Street Furniture Condition report with all Items placed into condition order.

Street Furniture Condition report broken up into the various types of Street Furniture and then into condition.

Isolated Failures Report detailing locations of all Street Furniture public risk locations and the cost to replace it.

Street Furniture Condition distribution graph.

3.5 Street Trees - Trees-2 File:

Valuation Report providing details of Replacement Value, Written Down Value and Depreciation for each group of Street trees within each assessed segment.

Street Tree Condition report.

3.6 Sealed Road & Street Pavements - Pave-2 File:

Valuation Report providing details of Replacement Value, Written Down Value and Depreciation for each of the Sealed Pavement segment within the System.

Pavement Condition report with all segments listed in overall condition order.

Pavement Condition report listed in Type of pavement and then condition order.

Isolated Failures report listing all sections of failed pavement in condition order with repair cost

Sealed road pavement condition distribution graph

3.7 Un - Sealed Road & Street Pavements - Uspave-2 File:

Valuation Report providing details of Replacement Value, Written Down Value and Depreciation for each of the Un - Sealed Pavement segment within the System.

Pavement Condition report with all segments listed in overall condition order.

Pavement Condition report listed in Type of pavement and then condition order.

Isolated Failures report listing all sections of failed pavement in condition order with repair cost

Unsealed road pavement condition distribution graph.

3.8 Seal or Surface Treatment - Seal-2 File:

Valuation Report providing details of Replacement Value, Written Down Value and Depreciation for each segment of seal within the System.

Surface Condition report with all segments listed in overall seal condition order.

Surface cracking report.

Surface Oxidation report

Seal edge Break Report

Sealed surface condition distribution graph

Seal age distribution graphs

4.0 St-Data2 File Set up:

The st-Data2 file is the database for the roads and street module. This is where all original data entry is undertaken. The file also contains a number of overall reports.

4.1 St-Data2 Sheets within the file

The File consists of 20 sheets the details of which are contained below. Most sheets will contain an Excel "Sheet Note" around the top left side of the sheet, which will provide an explanation of the sheet and its function within the broader system.

4.1.1 Notes on File Sheet

All Moloney programs have a "Notes on File" Sheet this one is around 6 pages in length and the aim is to provide enough explanation for a user to get started with the software.

4.1.2 Master Sheet

This is a sheet that contains all base asset data. This sheet is in effect the database for the system.

4.1.3 Codes Sheet

This sheet is used to record the unit valuation & life cycles of the sub assets as well as recording the details of all other codes used within the system. This one location contains all of the codes used within the road and Street module.

4.1.4 Run Sheet

This sheet is set up to assist with the running of the sub asset program files. Provision is made for the nomination of the sub asset reports that need to be run and they can all be run from a single command on the main "Roads" Menu. The sheet also stores overall asset valuations, key performance indicators and condition distributions for the sub asset files, which are returned to the sheet following the running of the sub asset files.

4.1.5 Invalid Entries Sheet

The program has two means of inbuilt data validation. One can be activated at the time of data entry. The other checks the data post entry. The post data entry validation is far more comprehensive than the "Data Validation on entry" system as it also checks for missing data, which is not possible within the other method.

The post data entry validation reports it's results within this sheet, it provides a very comprehensive list of all data entry problems along with the cell reference location on the master sheet. The data validation programs are accessed of the main "Roads" Menu.

4.1.6 Deleted Segments Sheet

This sheet is used to store any segment records that need to be deleted or removed from the Master Sheet. There is a program that removes a segment from the Master Sheet and stores it here. The program is accessed of the main "Roads" Menu. The idea being that no record should simply disappear and that there should be continuity of the segment ID numbers within either the "Master Sheet" or the "Deleted Segments Sheet".

4.1.7 Class Valuation Sheet

This sheet provides a valuation summary of all the road sub assets split into their individual type or code within each sub asset. For example all of the different types of concrete footpaths such as asphalt, concrete etc. would be reported on with separate total valuation figures for each.

4.1.8 Validation Parameters Sheet

This sheet allows the used to define the range of certain condition parameters. They will then be tested against that range within the data validation sheet. For example the pavement roughness default condition range in the Moloney system is 0 – 10. But this could be set to match the NASRA roughness counts at say 0 – 300 if required.

4.1.9 Capital Works – Update Fields

The sheet provides a coded summary of the fields that need to be amended (within the Master Sheet) following the capital upgrading or renewal of an existing asset.

4.1.10 Road Lengths Sheet

This is a summary sheet providing a report on the length of paved sealed and formed only roads within urban and rural districts. There is also a Victorian Grants Commission road length report within the sheet.

4.1.11 Road Register Sheet

This report sheet details the overall lengths of each road and street within a single line. Unless a road traverses two or more road register classes in which case the road is reported upon separately for each class.

4.1.12 Road Register Segment Detail Sheet

As for the above accept that this report details every road segment within the Master Sheet. It is a sheet that is not used often enough as it will greatly assist anyone in the field trying to locate a single segment with its full referencing of every segment.

4.1.13 Road Condition Sheet

This sheet provided a graphical report on the asset condition within any given road or street within the Master sheet. It contains a plot of condition against road chainage for most of the major asset sets within the road. It is updated from the main menu for any road nominated.

4.1.14 Data Recollection Sheet

Copies the Master sheet details and formats them to assist with data capture for the second and subsequent asset surveys.

4.1.15 User Defined Notes Sheet

This sheet provided a location to store unique data that is associated with the particular data set. For example it may contain the segment ID No's that were created at a certain time. The information and formatting of the sheet travels with the file and is also part of the Backup process.

4.1.16 Program Amendments Sheet

Records and stores any program amendments that may have been made to the file.

4.1.17 Abbreviations Sheet

Contains a list of any standard abbreviations that are used within the system. Some will be generic to the system while others may be unique to you.

4.1.18 Temp Sheet

Used for internal program operations and the importing and exporting of data to other Moloney programs. Do not store any details here, as they will be overridden during certain program operations.

4.1.19 Seg ID No Sheet

Used for internal program operations and the importing and exporting of data to other Moloney programs. Do not store any details here, as they will be overridden during certain program operations.

4.1.20 tb[Import Export Template] Sheet

Used for internal program operations and the importing and exporting of data to other Moloney programs. Do not store any details here, as they will be overridden during certain program operations.

4.1.21 General Information on the sheet layout and file

All permanent Data for the road system is entered into this file. Most data is entered within the Master Sheet other than the Code details, which are placed within the Codes Sheet. The file is the hub of the system and alterations within the file will be permanent and will be carried to all other subsequent reports. Care should

always be exercised when operating on this file. It is also recommended that a backup copy of the file or the data be kept in a safe place at all times and should be upgraded as permanent changes are made.

The basic set up of the Master sheet is as follows. The road or street segment under consideration is defined in length and then the details of the relevant sub assets associated with that segment are recorded. Segment length selection is somewhat a local issue but generally within township areas a township block is recommended while in rural areas a change in construction or seal is adopted. Accurate measurements of the sub asset quantity is achieved by providing a facility to add or subtract for each individual sub asset beyond the designated segment length.

Asset valuations are calculated within the sub asset files, by multiplying the quantity of the sub asset by the unit replacement cost as detailed within the sub asset code table within the File.

4.2 CODES SHEET within St-Data2 File:

All codes used within the program and others that are used for reference are located within the Codes Sheet. Codes within the Codes Sheet are fully user definable and new codes can be created as required.

The Program uses the codes as a means of accessing asset unit valuations and Life cycles. Valuation and or life cycles figures for the assets can be amended very simply within the Codes Sheet. The code blocks are copied to the sub asset files during the running of the sub asset report files.

Amendments to the Codes must be made within the Codes Sheet of the St-Data2 File. Once alterations are made it will be necessary to run the relevant sub asset file reports to carry the alterations through to the sub asset file.

For example if you amended from $70.00 to $75.00 per Square metre the value of a concrete footpath, the Footpath sub asset file would need to run again to bring it up to date with the amended valuations.

Some of the sub assets (Footpath, Kerb and Pavement) have a two stage costing structure. The reason for this is that within these sub asset files the cost of repairing the isolated failures has a two stage cost structure. For example it may cost $70.00 per square metre to replace 100 sqm of footpath but to replace only 2 sqm may require a higher rate.

Using the footpath sub assets as an example, your first code is placed into cell V12 the description into Cell W12, the unit rate for large areas in cell X12 and the unit rate for small areas in Cell Y12. Cell Z12 contains the expected life of the asset and the changeover point from large to small repair costing for all footpath assets is recorded within cell Y11. Column AA is used to record the details of the last valuation update (By PM in July 2006)

There is one other variable at the top of the codes sheet for each sub asset. In this case it is within cell X8 for the footpath codes and the figure is 8.00. This figure represents the condition at which the written down value will be zero. The full condition range within the Moloney system is 0 – 10. However, assets will tend to be rehabilitated at a condition below 10 and this facility provides the option to set the WDV range as full value at condition 0 and no value at condition 8 (or whatever condition you place in cell X8).

The codes sheet contains 94 locations for each sub asset code type. The sheet is formatted for A4 printing. See Figure No.1 below for an example of part of the footpath code block.

Table C4
FOOTPATH CODES

Written Down Value is 0 at Condition		8.00			
CODE	DESCRIPTION	VALUE Normal $ / sqm	Small $ / sqm 20	Foot/P Life Years	Valuations Updated By / ON
AS	Asphalt	25.00	50.00	20	PM July 06
BP	Brick Paveing Conc. Or Clay	75.00	150.00	50	PM July 06
C75	Concrete 75mm	68.00	136.00	50	PM July 06
C75B	Concrete Footpath with Brick Infills	70.00	140.00	50	PM July 06
CP	Concrete Interlocking Pavers	70.00	140.00	50	PM July 06
CPS	Segmented Con. Paving Slabs	70.00	140.00	50	PM July 06
CR	Crushed Rock Footpath	3.00	6.00	15	PM July 06
G	Gravel Footpath	3.00	6.00	15	PM July 06
NS	Natural Surface footpath that is in use	0.00	0.00	10	PM July 06
PC	Pattern Concrete	75.00	150.00	50	PM July 06
S	Bitumenous Seal	15.00	30.00	18	PM July 06

Fig. 1 Sub Asset Code Block Sample

4.3 St-Data2 File Master Sheet - Column Entries:

There are some 240 columns within the data entry sheet, which cover the asset data details. Some will need little or no explanation while others will be explained in some depth. Listed below is a column-by-column explanation of all data entries within the master sheet of the St-Data2 file.

Note that there is an MS-Excel comment within row 18 of the master sheet for all columns within that sheet. The comments can be applied to the Master sheet from the “Roads / 1 Master Sheet / 7. Formatting” Drop Down menu. These comments are quite extensive and should be enough for most situations.

4.3.1 Column A. Segment I D Number

This Segment ID number is generated from within the program. The last segment number generated is recorded within Cell G3 on the Master Sheet. If adding new lines of data entry after the initial set up it is recommended that you first sort the master sheet by descending ID No. Or run the formulae update program. This action will update the value within cell G3 to the highest ID used within the database. (See the drop down menu on Master Sheet). Segment numbers are used as identification for the segment and are essential for comparing the change in asset condition with time following future surveys. They are also important links within the RoadAsyst MIM program.

This is an essential field as it is the one that is used within the program to locate the bottom of the data set and hence the extent of the database. The program allocates an integer number and this is the recommended ID format. You can use any ID that you want if you are simply using the MS-Excel version of the program as the test within MS-Excel to find the extent of the database is simply weather the cell is empty. However it is recommended that an integer number be used.

4.3.2 Column B. Street Name

This is the name of the road or street being assessed. This is a required field as it is difficult to envisage a road or street segment that does not need to be identifies.

There are three useful conventions that have been used within this field when naming roads. They all relate to the ability of the filtering process within the program to find certain classes of road.

- Service roads should be identified with a S/R For example Hume Hwy S/R
- Parking bays and lanes at the side of streets should be identified with a B/B For example Abbot St P/B
- Rights of way and rear access lanes should be identified with a R/W For example Aberdeen Rd R/W

If this convention is adopted then it will be very easy to identify and quantify the extent of such assets using the MS-Excel filters. Note that the program has a built in facility to draw out the service rd and parking bay total lengths within the Road Lengths report sheet.

A	B	C	D	E	F	G
Seg I.D. No.	ROAD OR STREET NAME	SEGMENT DETAIL				
		FROM		TO		Total
		Street Name or Description	Dist. m	Street Name or Description	Dist. m	Pavement Length
4078	Tavener St	Anderson Av	0	Morris St	206	211
4079	Tavener St	Morris St	206	McCelland St	407	201
4080	Tavener St	McCelland St	407	Calder Hwy	986	579
4229	Tynan La	Victoria St	0	Start Seal	237	245
4230	Tynan La	Start Seal	237	Morris St	335	98
4231	Tynan La	Morris St	335	Bend Right	500	165
4232	Tynan La	Bend Right	500	McCelland St	592	96
4400	Ultima Rd	Calder Hwy	0	Change	215	225
4401	Ultima Rd	Change	215	100km Sign	360	145
4406	Victoria St	Anderson Av	0	Alexander Av	219	227
4407	Victoria St	Alexander Av	219	Church St	448	229
4408	Victoria St	Church St	448	Golf St	780	332

Fig. 2 Street & Road Set up Columns A - G

4.3.3 Column C. Street Name From

Within an urban district this would normally be the name of the Street where the segment commenced. It is recommended that segments within urban areas commence at property boundaries for the first segment and terminate at the road centreline of the next intersecting street. The last segment in any street should terminate at the property or building line. This sets up a fixed and repeatable reference system.

There will be times when it is necessary to create an additional segment between intersecting roads. For example there may be a major change in the type or age of construction of the Street mid block. In this case a new segment would be created at the point of change and the description of the start point instead of being a street name might be "Pavement Maj. Change" or "Pave Change".

In Rural areas changes will generally be at the point where a seal or construction change occurs. If this point is close to but not at an intersecting road then a useful description may be **8.66 Back Rd** the 8.66 being the actual chainage in km of the Back Rd Intersection while the distance in Column D may be say 8,500. Thus the intersection was 160 metres past the segment change.

It is important to document the chainage of as many intersecting roads as possible in the rural area. This will make the job of finding the segment ends far easier in the future. The method described above for recording the intersection chainages in km has proved to be very practical.

One other variation in rural areas has been to designate all Street from references for rural roads as the commencing chainage reference in the following way. **00 at Black Rd**. This reference would be the start reference on all of the road segments indicating on all segments that the origin of the chainage was Black Rd. The reason for this is to assist with engineering reports from the system in the rural area where there may not be any fixed reference for a particular segment other than a Change of seal reference. At least with the chainage origin recorded in each segment the segment can be found in the field.

The software now has the capacity to format the start descriptor in the rural area either standard or with the 00 at convention and to reverse it back if no longer required.

4.3.4 Column D. Distance From

This is the chainage in metres or distance along the street or road from the starting point of the segment under consideration. Accurate chainage or distance measurements are vital as they must be repeatable. It is recommended that a calibrateable odometer be used for this purpose

4.3.5 Column E. Street To

Name of the Street or other reference for the end point of the segment. If the road continues on then this will generally also be the street from reference for the next segment.

4.3.6 Column F. Distance To

The chainage or distance along the street or road for the end point of the segment under consideration

4.3.7 Column G. Total Pavement Length.

This cell records the pavement segment length and not simply the segment length. The pavement segment length is calculated by taking the from distance chainage in Column D from the To distance chainage in Column F and then adding any add on or subtract distance associated with the pavement as detailed in Column EI.

The from and to chainages within columns D & F can be seen as a surveyors reference line. The actual length of any sub asset within the segment can then be determined very accurately by the use of add on or subtract lengths from the reference chainage length. This add and subtract system is generally only used within the urban area.

Total pavement length is a very important figure within the database. It is used for the preparation of the "Road Lengths" Report sheet and allowing for the add ons and subtracts can make a significant difference to the total pavement length. If you follow the recommended segment set up within the urban area. It is clear that in most cases there will be an add on to the pavement length at the start and end of each road as the pavement will generally commence prior to the start of the property boundary.

The running chainage with add on references is also very useful for situations where the pavement or seal changes close to but not directly at a segment reference point. Here you may need to add a length to one segment and subtract it from the next. This will keep your quantities accurate while maintaining a logical reference datum.

H	I	J	K	L
ROAD RESERVE				
Wid m	Cons Val Left	Cons Val Right	Rd Res Valuation Code	Date of Ass
20	1	3	Res1	Jun-12
30	1	3	Res1	Jun-12

Fig. 3 Street & Road Set up Columns H - L

4.3.8 Column H. Road Reserve Width.

Width of the Road reservation in Metres

4.3.9 Column I & J. Conservation Value Left & Right.

The road or street conservation value is recorded here from another source and used as a means of flagging streets or roads with high conservation value for the benefit of persons organising works within the road reserve. (This facility is optional)

4.3.10 Column K Road Reserve Valuation Code

Enables the valuation of land under roads by assigning a unit value of the land per hectare to a code that is placed here.

4.3.11 Column L Date of Assessment

The date of the road conservation value assessment is recorded here.

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
C75	1.20	-15	**3**	4	2	Jan-85	AS	20	1.80	**6**	4	1	Jan-90
C75	1.20	-5	**2**	5	0	Jan-94	AS	60	2.60	**6**	5	1	Feb-90

Fig. 4 Footpath Data entry Set up Left side (Duplicated on Right AA - AN)

4.3.12 Columns M - Z . Footpath Details General.

There are two locations within the program to enter the data relating to footpath assets on each side of the street. Columns M - S are for a footpath that runs the full length of the Segment or near to the full length of the segment on the left side. Columns T - Z are used where an isolated segment of footpath does not run for the full segment length.

It is recommended that wherever possible the (over full segment length) section be used when only one footpath exists. This will assist with later overall planning functions within the program. The isolated segment fields are intended for those odd pieces of additional footpath or for very short sections of footpath where no other footpath exists within that segment.

In Figure 4 above there is a Code C75 (75 mm Concrete footpath) 1.2 Metres wide running for the full segment length of the first segment less 15 metres. The footpath condition is 3 and there are 4 lineal metres of footpath that have failed and need replacement now. There is also an urgency factor 2 associated with the failed segment of footpath. There is an isolated segment of asphalt footpath code AS measuring 20m x 1.8m in condition 6 with 4 metres of failed length recorded.

4.3.13 Columns M Footpath Overall Left Side Code

The C75 code here designated a concrete footpath of 75mm depth. Any code may be entered here that represents the footpath asset, provided that the code is also entered into the **Codes** Sheet of the St-Data2 File also.

This is the first of many valuation codes. Valuation codes are used as a means of delivering asset unit valuations and depreciation life cycles within the program. In this case the C75 footpath code must also be recorded within Table C4 of the Codes sheet. Against that code will be recorded a description, unit rate and depreciation life in years. Then within the program when these figures are required for the C75 footpath asset reference will be made to the figures within the table. Changes made within the table will impact on all C75 footpath assets during the running of the program.

4.3.14 Columns N Footpath Width

The width in metres of the overall left footpath is recorded here.

4.3.15 Columns O Footpath Add or Subtract

The program works on a segment length basis. If no entry is placed here then it is assumed that the length of the footpath segment within the left overall section is equal to the chainage in column F less the chainage in Column D. Note that this can be different to the total pavement length in Column G. Column G is a record of the pavement length and is subject to add and subtract figures from the Pavement section Column EI. The Add and Subtract facility allows you to be very accurate with the final quantity of footpath recorded.

4.3.16 Columns P. Footpath overall Condition

The overall condition of the Footpath, which is used to both value the footpath in its present state and to sort the footpath segments into condition replacement order. As a guide the following descriptions are provided for use in the assessment of a concrete footpath. Other types of footpath will need to be looked at on an individual basis.

4.3.16.1 Footpath Condition 0 - 1

A new footpath with no signs of ware or separation between individual slabs

4.3.16.2 Footpath Condition 2

A footpath in very good condition with only very slight signs of ware and no separation between individual slabs. There would be no signs of cracked slabs.

4.3.16.3 Footpath Condition 3

A Footpath in very good condition with only slight signs of ware and or very minor separation between individual slabs. In stable ground the footpath could be up to 20 -30 years old and be expected to have the bulk of its life still remaining.

4.3.16.4 Footpath Condition 4

A footpath in good condition with some signs of ware or separation between individual slabs. It would be the age and wear of the footpath that generally moves it into a condition 4 and not the slab separation.

4.3.16.5 Footpath Condition 5

A footpath in fair condition with obvious signs of ware and or separation between individual slabs but not to a severe extent. At this point the footpath would be expected to have around 30 % of its useful life remaining. A footpath would not generally be rated as high as condition 5 due to surface wear alone unless that wear was quite severe.

4.3.16.6 Footpath Condition 6

A footpath in fair to poor condition. There would be obvious signs of ware and or separation between individual slabs. The footpath would have lost 70 -80% of it's useful life and would be expected to be replaced within the next 10 years. With no difference in level between slabs the footpath would need to be very severely eroded to be rated at condition 6.

4.3.16.7 Footpath Condition 7

A footpath in poor overall condition. There may be obvious signs of ware and or separation between individual slabs. If the condition were allocated because of the structural condition of the concrete then the surface ware would be extreme and obvious. Regular slab cracking over much of the segment length may also result in a condition 7 rating. At condition 7 it would be obvious that the footpath needed to be replaced in the immediate future.

4.3.16.8 Footpath Condition 8

A footpath in very poor condition with extensive wear, cracking and or separation between individual slabs. The footpath would be in need of replacement now. A footpath at condition 8 would generally represent a risk to the public. Replacement of the footpath should be programmed immediately. There would be no doubt that the footpath was potentially dangerous and that it could not be treated by simply replacing some problem areas

4.3.16.9 Footpath Condition 9

A Footpath in very poor condition with extreme wear, cracking and or separation between individual slabs. The footpath would be in need of replacement immediately as its serviceability had ceased. The footpath would not be considered a safe footpath for public use.

4.3.16.10 Footpath Condition 10

A footpath in extremely poor condition. In practice a footpath in this condition would not remain in service as it would be a danger to the public and it would be more practical to remove the asset to avoid the chance of litigation.

4.3.17 Column Q. Isolated Footpath failures

Within the segment the extent of footpath length that needs to be removed and replaced because of failure is recorded here. The footpath may be just structurally unsound or it may have a trip factor associated with it. The assessment of the overall condition of the footpath is not downgraded as a result of a few small isolated failures. It is assumed that the isolated failures will be rectified as part of the ongoing maintenance program and thus should not influence the overall condition of the footpath. If however there were extensive failed segments then this would influence the condition of the footpath.

4.3.18 Column R Failure Repair Urgency

The urgency of repair associated with footpath problems is assessed here. In its simplest form the urgency is assessed by way of measurement of the extent of separation of the concrete slabs. In practice this is not the only measure of urgency but it is the most common and the easiest to quantify. The urgency factors listed below may be used as a guide or you may wish to develop you own standards. The aim of attributing an urgency factor to a footpath failure is to assist with the setting of works priorities.

Urgency factor 0. No obvious signs of a public risk problem associated with the footpath failure. It may be for example s badly cracked panel of concrete that has no vertical separation between the cracks.

Urgency factor 1. A vertical Separation distance between adjoining concrete surfaces of 12 mm to 25 mm

Urgency factor 2. A vertical Separation distance between adjoining concrete surfaces of between 25 & 40 mm

Urgency factor 3. A vertical Separation distance between adjoining concrete surfaces of greater than 40 mm

4.3.19 Column S Construction Year and Month

The date that the footpath was constructed is recorded here. It may be that you commence the recording of all new footpaths here or if the information is available in a suitable format that you transfer it to the asset management system. The data is recorded for information only at this stage but it could be very useful to track the performance of your assets with time or to develop a degradation curve for the assets.

The field is an MS-Excel date and is displayed as a month and year of construction. Be sure that you enter the field as an MS-Excel date and not as a text field.

4.3.20 Column T Isolated Segment Code

The code of the isolated segment is recorded here as for column M above.

4.3.21 Column U Isolated Segment Length

The length of the isolated segment of footpath is recorded here.

4.3.22 Column V Isolated Segment Width

The width of the isolated segment of footpath is recorded here.

4.3.23 Columns W - Z Condition - Urgency & Year of Construction

As for columns P - S above

4.3.24 Columns AA - AN Footpath Right Side

This is a repeat of the Data within Columns M - Z Above for the Footpath on the Right Side.

AO	AP	AQ	AR	AS
Footpath General				
Date of Insp.	Comments Relating To Footpath	F/P Hier Code	Usr Def	Usr Def
Jun-06	Failure Close to Shops Needs Attention	BD1		
Jun-06		U1		

Fig. 5 Footpath General Details

4.3.25 Column AO Footpath Date of Inspection

Recorded here is the date of the inspection of the footpath assets. This may be used as the accounting date for asset valuation purposes and will also be used when two sets of data are available to calculate the asset degradation rate. The field is an MS-Excel date displayed as month and year.

4.3.26 Column AP Footpath - General Comments

You can record here any comments relating to the footpath segments.

4.3.27 Column AQ Footpath Hierarchy

This is the footpath Hierarchy. It is a code that must be present within table C15 of the Codes sheet. It can be used within the program to assign weightings to both repair work and renewal work within the footpath sub asset file.

AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE
KERB LEFT SIDE											
Kerb over Full Segment						Isolated Kerb					
Code Type	Add Sub	Cond 0-10	Iso Fail	Urg 0-3	Const Date	Code Type	Len m	Cond 0-10	Iso Fail	Urg 0-3	Const Date
K4	-5	**2**	10	1	Jan-90	BK4	50	**4**			Mar-85
K4	5	**4**	2	3	Jan-78	SM6	25	**1**			Jan-02

Fig. 6 Kerb & Channel Data entry set up Left side (Duplicated on Right BF - BQ)

4.3.28 Column AT &AZ Kerb Codes

The set up of the kerb data input is very similar to that of the footpaths. There are two opportunities for the inputting of kerb data on each side of the road within each segment. Data entered into columns AT to AY deal with a kerb that covers the full length of the designated segment. The designated segment being the chainage in column F minus the chainage in column C. As with footpaths you can make allowance for the kerb length being longer or shorter than the designated segment length via the use of the add or subtract column AU.

4.3.29 Column AV & BB Kerb & Channel Condition.

The overall condition of the kerb, which is used to both value the Kerb in its present state and to sort the kerb segments into condition replacement order. As a guide the following descriptions are provided for use in the assessment of kerb condition.

4.3.29.1 Kerb Condition 0-1

A new kerb & channel with no signs of ware or movement following construction. A new asset.

4.3.29.2 Kerb Condition 2

A kerb in very good condition with very little sign of ware and no movement from its original alignment. Typically a concrete kerb in condition 2 would have signs of surface wear that were berley visible with no other defects.

4.3.29.3 Kerb Condition 3

A kerb in very good condition with very little sign of ware or movement from its original alignment. The alignment would be very true and the condition 3 kerb would have some minor wear.

4.3.29.4 Kerb Condition 4

A kerb in good condition with some signs of ware and or very minor movement from its original alignment. It may be holding water in places but only to a very limited extent. The alignment would still be very good and the kerb would be functioning well. Wear would be obvious but not severe and there could also be some minor movement in the kerb.

4.3.29.5 Kerb Condition 5

A kerb in fair condition with obvious signs of ware and or movement from its original alignment. It may be holding water in places but only to a limited extent. The kerb would still be functioning reasonably well but there may be some minor functional problems. A kerb could be in condition 5 because of wear only but the wear would need to be quite severe if that were the only problem.

4.3.29.6 Kerb Condition 6

A kerb in fair to poor overall condition with obvious signs of ware and or movement from its original alignment. The kerb could be holding water in its flat points at several locations. Condition 6 could be thought of as the starting point for a kerb that is no longer functioning well. For a kerb to be rated at condition 6 for wear alone it would need to be extreme wear. Generally there will be a functionality problem with the kerb to rise it to condition 6

4.3.29.7 Kerb Condition 7

A kerb in poor overall condition with obvious signs of ware and or movement from its original alignment. The kerb could be holding water at several locations or if true to its original alignment and still functioning well would be exhibiting very obvious structural problems beyond straight wear. At condition 7 a kerb would normally have quite obvious functional problems and would need to be replaced in the near future.

4.3.29.8 Kerb Condition 8

A kerb in very poor condition with obvious signs of extreme ware and or excessive movement from its original alignment. It would be obvious that the kerb was no longer capable of draining the road pavement and was in need of replacement in the immediate future. Condition 8 can be seen as the condition at which a kerb needs to be replaced because it is no longer fulfilling its function of draining the road pavement. The whole segment would need to be replaced and not simply a few isolated pieces of kerb within the segment

4.3.29.9 Kerb Condition 9

A kerb in extremely poor condition with obvious signs of extreme ware and or excessive movement from its original alignment. There would be a total break down with the functioning of the kerb and it would need replacing immediately. There would be no doubt that the kerb was overdue for replacement.

4.3.29.10 Kerb Condition 10

A kerb that is no longer functional at all that has lost its total asset value. It would be in a dangerous state and should be removed immediately.

4.3.30 Column AW & BC Kerb Isolated Failures.

The length in metres of kerb within a segment that needs replacing because of its failure to perform to an acceptable standard.

The failure can be in any of the following forms.

- Rotation of the kerb.
- Lifting and separating of adjacent kerb segments.
- The sinking of the kerb such that water is ponding within the kerb to an extent where it ponds beyond the limits of the kerb and encroaches upon the pavement.
- Structural failure - or the break down of the material of the Kerb.

You may wish to designate your own failure conditions, as to some extent the failure will depend upon the grade of the Kerb as well.

4.3.31 Column AX &BD Kerb Urgency factor.

This field is a measure of the urgency of the kerb isolated failure repair work. The same scale 0 to 3 will be used and listed below are some ideas on how it might be applied to the kerb assets.

Urgency factor 0. May relate to a failed section of kerb that has structural or movement failures but is not holding water because of the grade of the kerb.

Urgency factor 1. May relate to a failed section of kerb that is holding water but is not causing a severe problem hence a low urgency rating. The problem may be partly aesthetic.

Urgency factor 2. May relate to a kerb where the movement or failure is resulting in the retention of water and that is resulting in a serious pavement problem.

Urgency factor 3. Would relate to all kerb problems of a public risk nature and to most kerb problems within the highly visible areas of the commercial district. Would also relate to serious failures that had severe pavement problem implications.

4.3.32 Column AY & BE Date of Construction Year and Month

The date of placement of the kerb if known is placed here. This information can be of great use in the development of asset degradation curves. It may be that you commence the recording of all new kerbs here or if the information is available in a suitable format that you transfer it to the asset management system. The data is recorded for information only at this stage but it could be very useful to track the performance of your assets with time or to develop a degradation curve for the assets.

The field is an MS-Excel date and is displayed as a month and year of construction. Be sure that you enter the field as an MS-Excel date and not as a text field.

4.3.33 Column BF & BQ Kerb details Right side of Road.

The details above are duplicated here for the Kerb on the Right side of the Street.

BR	BS	BT	BU
Kerb & Channel General			
Date of Insp.	Comments Relating To Kerb & Channel	Next Treatment Code Type	Next Treatment Add Sub
Dec-97	Replace old Stone kerb with Concrete	K4	2

Fig. 7 Kerb General Information

4.3.34 Column BR Kerb - Date of inspection

The date of the last kerb inspection is recorded here and is used for accounting purposes as well as for the development of asset degradation curves. The field is an MS-Excel date and is displayed as a month and year of construction. Be sure that you enter the field as an MS-Excel date and not as a text field.

4.3.35 Column BS Kerb - General Comments

Comments relating to the Kerb Assets within the segment are recorded here.

4.3.36 Column BT - BU Next Proposed Kerb Treatment

Here the next kerb treatment may be designated as different from the existing treatment. For example you may place a kerb where none previously existed, you may decide not to replace a kerb in the future or change the type of kerb. The details here feed into the Liability sheet within the Kerb file and provide a future costing for the proposed kerb configuration.

If no entry is made within the field then the program assumes that the next treatment is the same as the existing and costs it accordingly. See section 6.1.1 below for more details on the operation of the Liability sheet within the kerb file.

BV	BW	BX	BY	BZ	CA	CB	CC	CD
STREET TREES LEFT SIDE								
Code Type Type	Cond. 1-10	No.	Date Placed M/Y	Proposed Works Code	No.	Urgency 1-10	Rec. Year	User Def
N4	**5**	5	Jan-00	T2	3	1	10	
E8	**4**	6	Jan-45	T1	6	8	3	

Fig. 8 Tree detail Left Side

4.3.37 Column BV Street tree Codes

Codes for the identification of street tree species on the left side of the street segment. In many cases this facility will not be used, as the function will be undertaken as a separate project. However as a simple means of recording basic street tree data the facility can be quite useful. The N10 code in Figure 8 above represents a native tree of 4 metres in height.

4.3.38 Column BW Street tree Condition

This facility is provided for consistency of approach across all sub asset groups and may be used as required to describe the overall condition of the tree.

4.3.39 Column BX & BY Number of Trees and Date Placed

The number of trees on the left-hand side of the street within the segment is recorded here. Column BY also allows you to record the date that the trees were placed.

4.3.40 Column BZ - CD Proposed works on Tree Assets

This facility is provided to enable you to track and cost basic tree maintenance works. Within Column BZ you place a code that is assigned to a particular tree maintenance activity. For example the T1 in Figure 8 above represents a basic small-scale trim of the tree. Within the codes sheet of the St-Data2 File a value and a life cycle is placed upon the T1 maintenance activity, which enables the annual costing of the tree maintenance to be calculated.

Column CA is used to record the number of trees that require the maintenance activity. It may be that you have 10 trees within the segment but only 2 of them require regular trimming because of their proximity to power lines. Column CB is used to place a priority on the proposed works. The more urgent the works the higher the urgency number. The urgency number is used to produce the priority of works list within the Trees-2 File. Column CC is used if required to assign a proposed year for the undertaking of the works while Column CD is a spare column that can be used to record and other data relating to the tree assets on the left side of the road.

4.3.41 Column CE - CM Tree assets on the Right Side of the Street

These columns are a duplicate of the columns BV to CD for use on the Right side of the Road.

4.3.42 Column CN & CO Tree Inspection Date and Comments

These Columns are used to record the data relating to tree inspections and any relevant comments.

CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA
ST. FURN. Item 1				**ST. FURN. Item 2**				**ST. FURN. Item 3**			
Code Type	Cond 0-10	No.	Const Date	Code Type	Cond 0-10	No.	Const Date	Code Type	Cond 0-10	No.	Const Date
B1	**5**	2	Jan-78	S2	**2**	2	Jan-00	CDF	**5**	1	May-05

Fig. 9 Street Furniture Details

4.3.43 Column CP Street Furniture Code

There are five locations for the placement of street furniture assets within each street segment. The details are contained within Columns CP - DI. If you have more than five items within any one street segment, then you may create another identical line of data entry with only the segment details and the street furniture details and all other cells left blank. You will also need to place an “N” within Column HG on the line of data entry in order to have the segment length not added to the total road length within cell G14 of the master sheet of the St-Data File.

Within Figure 9 above there are 3 entries for street furniture on the one line. The last two possible locations from Column DB to DI are not displayed. B1 is a rubbish bin Type 1 S2 is a seat type 2 and CDF is a cast iron drinking fountain. As with other asset groups these codes are recorded within table No C6 of the Codes sheet and deliver unit replacement rates and depreciation life cycles for the asset group as required within the program.

4.3.44 Column CQ Street Furniture Condition Factor

The street furniture condition factor is used to assess the written down value of the assets and to place a priority on the replacement of the assets. Because of the vastly different nature of the assets that may be recorded here no attempt has been made to describe a condition rating system. However as a general rule the following practice is recommended.

- Condition 0 – 2 New to very good condition assets.
- Condition 3 – 4 Good condition assets with some minimal loss of overall condition
- Condition 5 – 6 Fair to Poor condition assets with obvious loss of original condition.
- Condition 7 – 8 Poor to very poor condition assets needing replacement now.
- Condition 9 – 10 Extremely poor condition assets that should not remain in service.

4.3.45 Column CR Street Furniture Number of Items

The number of items of the particular street furniture is recorded here.

4.3.46 Column CS Street Furniture Date Placed

The Date that the street furniture was placed is recorded here if it is known.

DJ	DK	DL	DM	DN	DO
Usr Def Fld	Usr Def Fld	Risk Fact		Date of Insp M/Y	COMMENTS Relating To Street Furniture
		Code of Risk	Risk Factor (0-3)		
		S2	2	Jan-05	Dangerous Splinters in bench Seat

Fig. 10 Street Furniture Details - Continued

4.3.47 Column DJ - DK Street Furniture User Defined Field

These two columns are reserved for any other details that you may wish to record in relation to your street furniture as user defined fields

4.3.48 Column DL & DM Street Furniture Public Risk

If any item of street furniture is associated with a public risk factor the matter is recorded here and a note would also be placed in column DO providing further details. Only one item of street furniture can be assigned a risk factor per street segment. If there were more than one item within a segment that has a risk factor associated with it then you would need to create another segment as in section 4.2.43 above or make a note in the comments column DO.

The code of the item of street furniture that has the risk factor is identified within column DL. In the above example there was a risk factor associated with the seat type 2 and the details of the problem were recorded within the comments column DO. The dangerous splinters on the seat along with all other risk problems would be reported within the Stfurn-2 File within the risk items report sheet.

4.3.49 Column DN & DO Street Furniture Inspection Date and Comments

The date of the last inspection is recorded here as well as any comments relating to the street furniture.

DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ
FORMATION										
Code	Wid (m)	Add Subt.	Con 0-10	Hor Alig 0-5	Lon Gr 0-5	Long Dra 0-5	Ext Culv 0-5	Ext Tree	Shld Mat Code	Rur Shld Cond
C2	4.0	0	**1**	2	1	5	1	1	GS	1
C3	12.7	0	**1**	0	2	1	1	2	QG	-5
C2	12.9	0	**1**	0	2	2	5	4	CR	11

Fig. 11 Road Formation details

4.3.50 Column DP Road Formation Code

You can set up your own codes to describe the nature of the formations within your area. These may vary from place to place depending upon the importance and extent of the formations. The formation itself is the cutting or mound of natural material or fill upon which the pavement is placed. In some hilly areas the cost of the formation will greatly outweigh the cost of the pavement.

It is recommended that some variation on the following code format be adopted for consistency and ease of understanding of the code structure.

- C2 A formation in full cut 200 mm deep
- CF A Formation in part Cut and Fill of 500 mm magnitude
- F15 A Formation in full fill some 1500 mm in depth

4.3.51 Column DQ Formation Width.

This is the width of the overall road asset. For unsealed roads it includes the total shoulder weather paved or unpaved and on sealed streets with kerb & channel it is the distance from the back of kerb to back of kerb. The figure can be of use when calculating the amount of fill or excavation necessary for the reconstruction of a road or street asset.

4.3.52 Column DR Formation Add or Subtract.

This feature is generally only used within the urban area where the Start point for a segment is recommended as the property line. To obtain an accurate figure for the total formation length you must record the distance between the property line and the start of the formation. For formation assets the figure is a program-generated value. It is copied from the Seal add or subtract section in column GO during the updating of the Master Sheet formulae.

4.3.53 Column DS Formation Condition.

The program has a default figure of 1 for the formation condition and it is recommended that this be adopted. You may choose in a fully urban situation to disregard the formation detail and simply add the cost of the formation to the cost of construction of the pavement. However, some of the other information within the formation section will be of use within the urban area.

4.3.54 Columns DT - DZ Formation Details

These seven columns are to some extent user definable and can be used to assist with the recording of unique information that you may wish to maintain. Detailed below are the details of the recommended use for the fields but they perform no program function and hence can be amended to suite your needs.

4.3.55 Column DT Horizontal Alignment

A ranking of 0 - 5 is used to describe the horizontal alignment. The following descriptions are provided as a guide to the use of the variable.

- Very straight and high speed capable of 100km/hr
- Good Alignment Large Radius curves Design Speed of 80 - 90 km/hr

- Reasonable alignment Good curves Design Speed of 60 - 80 km/hr
- Alignment with some slow points & Design Speed of 50 - 60 km/hr
- Poor alignment with tight curves and a design speed of 30 - 50 km/hr
- Very Poor alignment with tight curve and design speed of less than 30 km/hr

4.3.56 Column DU Longitudinal Grade

A ranking of 0 - 5 is used to describe the longitudinal grade. The following assessment of the ranking is provided as a guide.

0 Flat Grade

1 Very Gentle Grades of up to say 1%

2 Gentle Grades of up to 3%

3 Moderate Grades of up to 7%

4 Steep grades of up to 10%

5 Very Steep grades in excess of 20%

The measure of longitudinal grade can be of great use in many situations. If for example you were considering a kerb replacement program the grade of the kerb could influence the selection of replacement candidates,

4.3.57 Column DV longitudinal Drainage Condition

A ranking of 0 - 5 is used to describe the condition of the road and street longitudinal drainage. Drainage is a key maintenance condition factor that affects overall asset condition and a flagging of problem areas is a most valuable rating to have. Detailed below is a suggested approach to the ranking of the road longitudinal drainage.

0 Excellent Drainage with no problems evident

1 Very good table drains with little or no problems evident

2 Good condition table drains with some minor problems

3 Table drains in Fair condition with clean out work needed in the near future

4 Poor condition table drains with clean out work required immediately

5 Very poor condition drains that would be adversely impacting on the pavement

4.3.58 Column DW Extent of Culverts

This condition factor is generally only used for unsealed roads and is intended as a guide only to the provision of culverts as required. A ranking of 0 - 5 can be used but in practice it has been found that 3 ranking's will cover the visual inspection.

1 The road appears to have culverts at all low points or no need for culverts.

3 Some culverts present but not at all required locations.

5 A need for culverts and none present within the segment

The idea for this variable came out of the undertaking of unsealed road inspections in rural areas where the difference between a road that had all of it's requires culverts and one that had none was not otherwise recorded within the system.

4.3.59 Column DX The Extent of Trees

Provision has been made here to record the extent of tree intrusion into the road and driving zone. We have not attempted to define the variable too much. It can be a user definable field to record areas where tree trimming is required or where trees are very close to the pavement. The use of the field is up to the individual council

4.3.60 Column DY Shoulder Material Code

The material present on rural sealed road shoulders can be quite variable and this field is often used as a Code field to describe the material. In this case we have GS - Granite Sand : QG - Quarts Gravel and CR - Crushed Rock. The codes should be recorded and described within Table C 11 "Record of Pavement Material Codes" within the Codes Sheet

4.3.61 Column DZ – Rural Shoulder Condition

This factor was added to record the rural sealed road shoulder condition. There are two potential problems with the shoulders on rural sealed roads. Firstly they can be worn away leaving a drop off the edge of seal. Secondly they can be built up above the edge of seal and result in the holding of water over the outer sealed road pavement.

A single condition rating had been developed to cater for the 2 situations as detailed below. The full scale of this variable is at first a little strange as it runs from -10 to 11. Basically 0 - 10 defines a drop off and -1 to -10 defines a build up as detailed below. There is also the situation where there is no shoulder on the road and to avoid any confusion with missing information we recommend you adopt a condition 11 to define this situation.

For the fall off from the edge of seal the following condition rating is recommended.

0 – 1 Shoulder flush with seal – no drop off

2 – 3 Shoulder with small drop off from seal of less than 25 mm

4 – 5 Shoulder with moderate drop off from seal from 25 to 50 mm

6 – 7 Shoulder with large drop off from seal from 50 to 75 mm

8 – 10 Shoulder with Dangerous drop off from seal greater than 75 mm

Note also that very steep slopes on the shoulder would also be called up on this 0 – 10 scale even if there was no actual drop off at the edge of the seal.

For the build up of the shoulder above the edge of seal the following condition rating is recommended.

-1 to -3 Small Build up above seal below 20mm

-4 to -5 Moderate Build up above seal from 20 to 40 mm

-6 to -7 Moderate Build up above seal from 20 to 40 mm

-6 to –7 Bad Build up above seal from 40 to 70 mm

-8 to –10 Extreme Build up greater than 70 mm

EB	EC	ED	EE	EF
Date of Insp. M/Y	COMMENTS Relating To Formations	Usr Def Fld	Usr Def Fld	Usr Def Fld
Jun-06				
Jun-06				

Fig. 12 Road Formation General Details

4.3.62 Columns EB - EF Formation General Details

Column EB records the construction date of the original Formation if it is known. Column EC is used to record any general comments in relation to the formation. While ED – EF are user definable fields.

EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY
PAVEMENT																		
Code Type	Wid m	Add Subt m	Prog Cond 0-10	O/A Cond 0-10	% Imm Fail	% Pot Fail	Mode of Fail	Rug 0-10	Rut 0-10	Pro 0-10	Mtce Grade 0-10	Exis Pave Deph	Pave Mat Code	Sub Soil Type	Pave Mat Qual	Mat Prob Code	Pave Area sqm	% Res Val
2	14.0	5	**9.00**	**8.0**	10.0	20.0	CC/CL/PS	8	3	6	2						2,839	25.0
2	14.0	0	**7.28**	**7.0**	3.0	5.0	CC/CL/PS	7	1	5	2						2,531	25.0
2	6.5	0	**6.50**	**6.0**	5.0	10.0	CR/PS	6	4	6							3,834	
P10	3.0	8	**9.50**	**7.0**	50.0		B	7	5	6	7	50	LSM				735	

Fig. 13 Road Pavement Details

4.3.63 Column EG Pavement Code.

This field contains the pavement code. It relates to table C2 on the codes sheet. The adopted codes are fully user definable now. The prior requirement that the code needed to be numeric for sealed roads and alpha numeric for unsealed is no longer the case. The separation of these two pavement types is now achieved via the presence of a width within the seal width field in Column FN.

The one strong recommendation is that a code “Z” be used for formed only roads. That is roads with no imported pavement material. If this is done the program will report on the length of such roads within the “Road Lengths” sheet.

It has been found that for unsealed roads, codes such P10 and P15 indicating that the road is paved with 100 and 150 mm of pavement material respectively are simple and practical codes that are easily understood.

4.3.64 Column EH - EI Pavement Width and Add & Subtract

The width of the pavement is as measured on site. The add & subtract length in metres is the extra or shorter distance by which the pavement length varies from the designated segment length. For the sake of simplicity it is recommended that in rural areas you avoid the use of add & subtract distances by commencing and ending the segment at the intersection point with the cross road and not the property line as is recommended within township areas. The facility can still be used in rural areas to add in extra length for a side road swing in etc.

4.3.65 Column EJ Program Pavement Condition

This condition factor is calculated within the program and can be amended to reflect individual needs if required. The formulae is contained within cell EJ11 on the Master Sheet and is then applied to all cells within column EJ when the program is updated but stored in the data set as a value (no formulae is present). For sealed road pavements the default setting takes the worst of the 3 shape characteristics (roughness, rutting and profile) and then further degrades the condition based on the presence of immediate and potential isolated pavement failures. The extent of immediate failures as a percentage of the pavement area is raised to the power on 1.2 and then divided by 20. For potential failures it is raised to the power of 1.2 and divided by 40. The raising to the power of 1.2 was found necessary to provide a stronger lift in pavement condition as the extent of the isolated pavement failures rose.

For example if the worst shape characteristic was 4 and there were no pavement failures the program condition would be 4.00. If there were 20% of potential failures the program condition would rise to 4.91. If the potential failures rose to 50% program condition would rise to 6.73. Finally if an additional 10% of immediate pavement failures were present in addition to the 50% potential, the program condition would ride to 7.62. While the program condition is user definable within cell EJ11 there are no councils that have found it necessary to amend it at this stage.

For unsealed road pavements the program condition is adopted as the single overall condition entered into column EK.

The program pavement condition is also the condition factor that the written down value is based upon within the valuation sheet of the two pavement files if this figure is based on condition rather than age. You should thus be aware that changes to the formulae that generate the figure will affect the WDV within the valuation sheets of the sub assert files.

Note also that a weighting can be attributed to the type of pavement within the road hierarchy table in table C12 of the Codes sheet.

4.3.66 Column EK Overall Pavement Condition

The overall pavement condition is a figure that lies between 0 and 10. At Condition 0 the pavement is new and has the whole of its life ahead of it while at condition 10 there is no residual value within the pavement. In practice a sealed road would never get to condition 10 because if it were still in use there must be some residual value and if it were so bad that it could not be used it would be ripped up and turned back to gravel.

The Overall Condition assessment of a sealed road depends upon factors such as roughness, the extent of failed pavement the extent of cracking etc. However the condition of an unsealed pavement is determined by assessing the amount of pavement material that is remaining on the road segment along with its quality, against a given design standard.

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**

The consideration of sealed pavement overall condition is far more difficult to determine, but an experienced assessor can provide you with a high degree of consistency. As a guide the following descriptions are provided for use in the assessment of a single condition factor for sealed road & street pavements.

The pavement condition is rated 0 - 10 with 0 in new condition and 10 having no residual value remaining. In practice in would not be possible to be still using a sealed road in condition 10. The condition rating system presented here has been designed as a visual condition rating system.

The recommended method for sealed pavement assessment is to first assess the other pavement condition factors of roughness, rutting, profile, and the extent of immediate and potential failed pavement areas. With this assessment completed the supporting evidence is available to select a single overall pavement condition assessment for the road segment.

If a segment is given a bad overall pavement assessment then there must be supporting evidence within the other pavement condition fields to justify the adopted figure. It might be that the pavement was excessively rough, or that it had extensive potential failures. The overall pavement condition is intended as a summary of the other condition factors as well as a checking mechanism.

In selecting the pavement condition for a road segment you should bear in mind the expected useful remaining life. Think of the condition rating as representing the amount of pavement life that has been spent. Cond. 3 (30% of life spent) Cond. 8 (80% of life spent).

4.3.66.1 Sealed Road Pavement Condition 0-1

This would be a new pavement or one that was in as new condition. There would be no signs of any pavement problems or wear. The pavement would be very smooth to ride on and there would be no evidence of any movement since the construction of the pavement was completed.

4.3.66.2 Sealed Road Pavement Condition 2

At condition 2 a pavement would be in MS-Excellent condition with no signs of any distress or unwanted movement. The ride would be MS-Excellent with only the most minimal roughness evident.

4.3.66.3 Sealed Road Pavement Condition 3

Condition 3 pavements would be in MS-Excellent condition with only minor signs of roughness or deformation and pavement failures would be extremely rare. To some extent it would be the age of the pavement that had moved it from condition 2 up to 3. But the pavement would tend to be slightly rougher and or more miss shaped than a condition 2 pavement. This would still be a very good and true shaped pavement.

4.3.66.4 Sealed Road Pavement Condition 4

At condition 4, a pavement would be exhibiting some signs of distress. It may have lost some shape or it could have a degree of roughness associated with it. Condition 4 pavements would not be expected to have extensive pavement failures, although there may be some minimal and localised pavement failures. The

pavement would be quite structurally sound and in most cases it would be the slight loss of shape and or moderate roughness level that warranted the condition 4 rating.

Pavements within condition 4 would be expected to have half or perhaps a little more of their life remaining and could be in excess of 40 years old.

4.3.66.5 Sealed Road Pavement Condition 5

By the time a pavement reaches condition 5, there would be obvious signs of distress. There could be a number of reasons why the pavement has been rated at condition 5. Often it will simply be the general roughness or shape of the pavement. A pavement rated at condition 5 for roughness and general profile only would need to be reasonably rough. In the rural area you would be aware of the roughness at 100 km per hour but it would not feel that the road needed immediate attention.

In other cases a pavement would be rated at condition 5 because of the extent of localises pavement failures. If there were 15 – 20% of the pavement area subject to some form of potential pavement failure then this could place an otherwise well shaped pavement into condition 5. If the pavement had both the failures and the roughness then it may be a condition 6 pavement.

4.3.66.6 Sealed Road Pavement Condition 6

At condition 6 a pavement would be quite noticeably rough if it were roughness and shape alone that constituted the condition 6 rating. The ride on the road in this case would be quite noticeably rough but not to the point of being uncomfortable in a standard sedan car.

If it were pavement failures that was driving the rating then the extent of the failures would be in excess of 30% of the pavement area. Where a combination of the two factors came together to create the condition 6 rating then neither factor would need to be as severe as described here. If it were, then the pavement condition would probably be a condition 7 pavement.

At condition 6 the pavement would still be expected to have a reasonable life in front of it although the bulk of its life would have been spent. The pavement could be heading for a minor or major capital rehabilitation within a few years if it was a strategic route but equally could have many years of remaining service as a minor route.

4.3.66.7 Sealed Road Pavement Condition 7

At condition 7 a pavement is in poor condition and is approaching the time where it should be scheduled for reconstruction or major rehabilitation. If the roughness and shape of the pavement were the principle mode of failure then the pavement would be very rough. The speed of vehicular travel over the pavement would be restricted because of the roughness.

There would generally be obvious signs of pavement failure present but a condition 7 pavement could be based upon roughness alone. Condition 7 could also be allocated if the pavement exhibited extensive areas of failure or potential failure over a large portion of the segment. This would generally be in excess of 40% – 50% of the area of the segment.

A combination of roughness and pavement failure to a lesser extent than detailed above could also constitute a condition 7 pavement. You should think of a condition 7 pavement as one that does not need to be rehabilitated immediately but it would have serious and obvious structural flaws and as such could require rehabilitation in the near future.

4.3.66.8 Sealed Road Pavement Condition 8

Condition 8 can be thought of as the general intervention level for rehabilitation of local road pavements. The more strategic heavily trafficked pavements may be rehabilitated at condition 7.

At condition 8 a pavement would be exhibiting severe problems. If attributed to roughness and shape alone the roughness would be extreme and the driveability of the road would be a real problem. If linked to pavement failure the extent of the failures would exceed 50% of the pavement area.

In most cases a condition 8 pavement would have some degree of pavement failure. It would be rare to achieve a condition 8 rating based upon roughness and shape alone, but it does occur. The pavement would be in need of immediate rehabilitation and this would be obvious to the assessor. The pavement could in fact be starting to be a little dangerous to drive upon at the design speed.

Condition 8 could be allocated for roughness alone where the design speed was high, where on a low speed with the same roughness the overall condition may be rated at condition7.

You should think of a condition 8 pavement as one that requires immediate rehabilitation.

4.3.66.9 Sealed Road Pavement Condition 9-10

These condition factors are not often used, as a pavement at condition 9 would be in a very dangerous state and should not be subject to traffic movements. The condition factors may be applicable on rare occasions where roads are found to be in extremely poor condition and obviously should not be in service. You should think of condition 9 and 10 pavement as pavements that are dangerous and in such a poor state that they should be closed off to the public.

4.3.66.10 Basis of the Program condition in Column EJ

The program pavement condition is the one used within the program to deliver valuations and to set renewal priorities. The Overall pavement condition for sealed roads has no impact on the Program condition but it is used as a check that the shape and failure figures are appropriate. For sealed road pavements program condition is derived from shape and failure characteristics only.

For unsealed roads the program condition is set by the overall pavement condition plus an allowance for pavement failures. This is because for unsealed pavements the shape characteristics really are just a maintenance matter and not related to capital condition.

4.3.67 Column EL Pavement Immediate Failures.

This condition factor is intended as a means of flagging isolated pavement failures requiring immediate attention. The assessor is required to estimate the percentage of the pavement area that is subject to pavement failure. There is no limit to the percentage that can be called up but in practice a figure between 0.1 and 10 would be expected.

If the percentage of immediate failure is low then the impact of these failed areas is neglected when assessing the overall pavement condition and the very small percentages have only a minimal impact on the program condition. The assumption here is that the dig out areas will be treated under a major patching program and thus the future road condition will not be affected by the small failed areas.

It is not expected that the estimate of the extent of immediate failures will be a 100% accurate figure. Real accuracy could only be achieved by measuring each location. This could be done if you require that degree of accuracy. As a first draft the intention of the program is to locate all trouble spots and to give an estimate only, of the degree of work required**.** The failures identified under this column are those that need immediate repair and not the impending pavement failures that are dealt with under column EM.

4.3.68 Column EM Percentage of Potential Pavement Failures.

This column has been included to enable you to identify the location and extent of potential pavement failures. While the immediate failure requirement has identified the area of pavement that needs attention right now, this factor quantifies the extent of potential pavement failures that may need attention in the near future.

Typically the type of failure that will be identified here will be the mild pavement heaving or sinking or the crocodile cracking that is the early indicator of future problems. The potential failure field is reserved for failed pavement areas that do not require immediate attention but may require attention in the near future. Potential failures can occur without immediate failures. But in most cases immediate failures will have additional potential failures associated with them. The factor is expressed as a percentage of the pavement area of the segment under consideration and can range from 0.1% to 100%.

4.3.69 Column EN Mode of Failure.

Provision is made here to record the mode of any pavement failure that is encountered. For example you may create Codes for Heaving, Cracking and Pot Holing. This data is recorded for information purposes only. You may also combine the codes for example CC/PS may indicate that the mode of failure is a combination of crocodile cracking and pavement sinking. The codes for mode of pavement failure are recorded within the “Codes Sheet” commencing at column BG.

These codes are all checked during the running of the “Invalid Entries” reports. You may combine up to 3 individual codes within the field and provided you separate each with a / the “Invalid Entries” report will locate any errors.

4.3.70 Column EO Pavement Roughness.

This can be a simple visual assessment or it could be derived from a mechanical means of measurement.

The mechanical measurement of pavement roughness is a very useful long-term tool. When multiple records of the same pavement segments measured at different times are available then you have strong data to undertake a pavement performance prediction model.

If assessed visually the pavement roughness is intended as a means of supporting the overall pavement condition. If there were no pavement failures within a segment and no other poor pavement conditions then a high roughness condition would indicate the reason for a high overall pavement condition. If mechanical measurement is undertaken then the 0 - 10 condition could be linked to NASRA counts or the counts themselves could be placed into the field.

Alternatively you can now set the data validation range for a number of condition factors including this one. See the notes relating to the “Validation Parameters” sheet above. Thus the range of this field if set for NASRA roughness counts could be 0 – 300.

There could be a relationship developed between the NASRA count and the 0 - 10 visual roughness scale as a starting point the following guide is provided.

This is a very important condition factor for sealed roads as it is often the one that drives the Program pavement condition via the formulae used for that variable.

Moloney Condition Rating	Correlation with NASRA roughness Counts	Description of driving conditions at 100 km / hr in a car with standard suspension
0	0 – 20	No discernible roughness at all
1	20 - 40	Roughness very difficult to discern
2	40 - 50	Just at the threshold of discernible roughness
3	50 - 70	Roughness now felt but not causing any problems or discomfort
4	70 - 80	Roughness becoming obvious but still not the cause of any concern
5	80 - 90	Roughness would be quite apparent and being felt in the vehicle but it would not be a real problem to the driver.
6	90 - 110	Roughness would be quite apparent to the driver and it would be beginning to be a little uncomfortable.
7	110 - 140	The road would be rough and quite uncomfortable in the car.
8	140 - 170	Roughness here would be at the point where the roads would need to be rehabilitated because of roughness alone.
9	170 - 200	Roughness would be extreme and driving very uncomfortable. It would be difficult to reach the 100-km/hr speed limit.

10	200 +	Extreme roughness and dangerous to drive upon at speed.

4.3.71 Column EP Pavement Rutting.

This can also be a simple visual assessment or it could be derived from a mechanical means of measurement. Rutting while very important on heavily trafficked roads is not often a problem encountered on local roads & streets. The factor is however very useful as a means of allocating priority to a resurfacing or reconstruction program.

As a guide to the selection of the rutting condition rating the following details are provided. Rutting occurs in the wheel path of traffic lanes and is caused by underlying deformation resulting from heavy applied traffic loads. It is suggested that a simple way to measure the extent of rutting is to place a 1,200 mm straight edge across the traffic wheel path and to then measure the maximum deformation along the straight edge. As a guide the following correlation between deformation and condition rating is provided.

Deformation in traffic path along a 1200 mm long straight edge in mm	Suggested Rutting Condition Rating
Up to 10	0
10 to 15	1
15 to 20	2
20 to 30	3
30 to 40	4
40 to 50	5
50 to 60	6
60 to 100	7
100 to 150	8
150 to 200	9
Greater than 200	10

4.3.72 Column EQ Pavement Profile.

The shape or profile of the pavement across its horizontal cross-section is a very useful factor in the assessment of the overall pavement condition. There are available some laser measuring devices that can provide you with a very detailed profile of the road surface.

The visual roughness, rutting and profile along with cracking in the sealed surface are the failure fields that come together to provide supporting detail for a given overall pavement condition. They can also be used to assist with the development of proposed pavement rehabilitation treatments.

Bad profile condition could occur without roughness and rutting. It may be that the pavement has sunk at its centre and is holding water. Profile is also very useful as an unsealed pavement condition to describe a pavement that requires heavy grading or reshaping.

Profile probably does not require a 0 – 10 condition scale but for the sake of consistency this is what shall be used. Profile is all about the shedding of water from the pavement area When we talk about the retention of water you should neglect the longitudinal grade of the road and think in terms of the expulsion of water across the road cross section.

This is the third of the pavement shape parameters that is picked up. Roughness can be seen as the roads longitudinal shape. Rutting is directly related to wheel path deformation and profile can be seen as the cross sectional pavement shape. If rutting were extreme then profile would also be poor. However you could have a very low rutting score and a high profile where the pavement was generally sunken but not necessarily within the wheel path. Profile condition is very difficult to describe but poor condition profiles will be obvious. The descriptions below could be used as a general guide to the selection of the profile condition rating.

Description of road Cross Sectional Profile	Suggested Profile Condition Rating
A well shaped road profile that would very quickly disperse rain water from the road surface leaving little or no ponding	0 to 2
A reasonably shaped road profile that would generally disperse rain water but may leave some isolated ponding areas with depths up to around 6 mm	3 to 4
A pavement profile that does not disperse rainwater efficiently. There would be extensive ponding following rain with depths up to 12 mm	5 to 6

A very poorly shaped road cross-section with extensive pavement movement. Water would be retained over a large portion of the profile to depths up to around 50 mm	7 to 8
An extremely badly shaped pavement cross section with massive pavement movement and retention of rain water in excess on 50 mm depth	9 to 10

4.3.73 Column ER User definable Pavement condition factor

This condition location is provided as a user definable condition factor, which could be used to assist in the development of the "Program Condition". It was formally the maintenance grading condition but that was superseded by the introduction of the 3 shape characteristics some years back.

4.3.74 Column ES Existing Pavement depth

This factor is designed to record the average existing pavement depth on unsealed roads at the time of the survey. To some extent it is a check on the choice of pavement condition for unsealed roads. You could derive the unsealed pavement condition from this figure within the office following the completion of data entry. It is not intended that the sealed pavements be measured in the field but unsealed pavements should be dipped at around 500 metre intervals or otherwise as necessary to achieve an average segment depth.

4.3.75 Column ET Pavement material Code

This factor is designed to be used for the assessment of unsealed pavements. The intention is to identify the type of pavement material with a standard code or reference. For example CR may be used to represent crushed rock and G may be used to represent gravel.

The codes can also be combined and within the example in the figure above the code CR3/G indicates that there was 30mm of crushed rock overlying gravel layer of 50 mm. The 50 mm depth being derived by taking the 30 mm from the total depth of the pavement of 80 mm in column ES.

You may create the codes that best suite your needs and store them on the "Codes Sheet" in Table C11. The "Invalid Entries" report sheet will report on the validity of the codes in this field for up to 3 code types, provided you separate the codes with a / as indicated in the example above. The data validation process will also strip off any numeric value that is places after the code. In this way if the materials are in distinct layers you can record the depth of each layer after the material code.

4.3.76 Column EU - EW Sub Soil Type and Materials

These columns are provided as a means of recording information relating to the sub soil and pavement material. There is no recommended approach to their use and you may use them as required.

4.3.77 Column EX Pavement Area

The pavement area is calculated within the program and recorded here. It is used in the calculation of asset valuations in the sub asset reports.

4.3.78 Column EY Percentage Residual Value

Unlike other sub assets, when a road pavement is rehabilitated it often has a considerable residual value. For example a pavement may have failed because of its shape loss. The next treatment may be a pavement overlay. The original pavement had say 300 mm of pavement material and the planned overlay is 100 mm depth.

The residual value in the pavement may be within the range 20 to 50 percent of the full replacement value of a new 300mm deep pavement. This entry allows you to nominate a residual percentage of the pavement value, which in turn feeds into the written down value, and the annual depreciation of the pavement within the pavement valuation report of the Pave2 File.

In effect the program only depreciates that portion of the pavement valuation that is non-residual. This is a very important concept and meeds to be fully understood before it is adopted as it can have a big impact on asset valuations.

The WDV also carries the residual component of the pavement at its full value for the life of the pavement. The concept of residual value came about because of the accounting requirement in at least one state to value the pavement assets at new greenfields costing. The next capital treatment following the original

greenfields construction can often be achieved at far lower unit rates than the original, hence the residual value.

EZ	FA	FB	FC	FD	FE	FF	FG	FH
Pavement Construction History								
Treatment 1			Treatment 1			Treatment 1		
Code	Depth mm	Const Date	Code	Depth mm	Const Date	Code	Depth mm	Const Date
G/M	100	Jan-50	GS/H	150	Jan-75	CR/A	200	Jan-06

Fig. 14 Road Pavement Make up Detail

4.3.79 Column EZ - FH Pavement Construction History

These Nine columns may be used in any way you wish to record the pavement history. In the example above the nine columns have been grouped into threes allowing for the recording of the last three major pavement treatments with the type of treatment the depth of the pavement layer and the date of construction.

Column EZ contains a code that relates to Natural Gravel from Pit M (eg Molly's Pit). Column FA indicated that the depth of this pavement layer was 100 mm. Column FB indicates that the year of treatment was 1950. This facility is provided as a means of recording the pavement make up. If no historic data were available then it would be very useful to begin the recording process from the present time. In this way your pavement history will build up with time. It could also be very useful to track the performance of pavement materials from different sources.

FI	FJ	FK	FL	FM
Pavement General				
Date of Insp.	Comments Relating To Pavement	Next Treatment		
		Code Type	Width	Add Subt.
Jun-06		CS150	7.20	5

Fig. 15 Road Pavement General Details

4.3.81 Column FI Date of Pavement Inspection

The date of the pavement inspection is recorded here.

4.3.82 Column FJ Comments relating to Pavement

Any Comments that you may wish to record in relation to the pavement are recorded here. These comments are transferred to the pavement file and are generally part of the standard print out of each of the pavement reports.

4.3.83 Column FK - FM Proposed Next Pavement Treatment

The purpose of these three fields is to allow you to record the next proposed pavement treatment. The example within the Figure above indicates that the next treatment for this segment is to be a 150mm deep cement stabilisation process 7.2 metres wide and exceeding the segment length by 5 metres.

Within the pavement files (sealed & unsealed) the costing of the replacement pavement within the condition sheet report will be based upon the details that are placed within the proposed next treatment columns. If no entry is made within these columns then the assumption is that the next treatment will be the same as the existing. The width function also allows you to vary the width of the proposed pavement even if the type of treatment is to remain the same.

It should be noted that the total replacement value of the pavement assets within the valuation report and the condition report of the two pavement files may vary, if you have used this facility. From a management point of view this facility allows you to present the accounting figures based upon the existing pavement

details (recorded within the valuation report) and future liability costs based upon the proposed next treatment (recorded within the condition report).

There two figures can sometimes be very different and with accounting figures often set by very strict external rules there is little freedom of movement to accurately reflect the true future financial liability of the assets. The approach taken here to provide the accounting figures separate to best estimate of future liability may not be perfect. But at least it can satisfy the two, often-conflicting demands.

FN	FO	FP	FQ	FR	FS	FT
Sealed Surface						
O/A	Second Width		Third Width		Various	Add or
Width	Width	Length	Width	Length	sqm	Subt.
m	m	m	m	m		m
3.8	6.2	330.0	5.6	550.0	400.0	-10

Fig. 16 Sealed Surface Dimensions

4.3.84 Column FN - FT Sealed Surface Dimensions

The precise measurement of the sealed surface area is very important if you intend to use the data contained here within your resurfacing program. Provision has been made for three different widths within the one segment and also an opportunity to place an additional area of sealed surface to cover odd shapes (within column FS).

In the example above the basic width of the segment is 3.8 m. However there is a 330 meter length with a width of 6.2 m and a 550 metre length with a width of 5.6 m. The program will calculate the overall area of seal based upon a 3.8m width for the full section less 550 m at 5.6m width and 330 m at 6.2 m width. In addition to this an area of 400 square metres will be added to the total area (Which may be to cover intersections that will be treated at the same time as the main road). Finally, there is a further consideration for the total segment length adjustment of –10 in column FT. This process allows you to be very accurate with the final total area of seal.

You may choose to simply use the various square metres to add in all of your extra widths and intersections at the one time but this would not be as traceable for future reference. The add or subtract feature in column FT is the same as for footpaths and kerbs above and allows you to extend or shorten the seal length beyond the designated Segment length. In this case the seal has fallen short of the segment length by 10 metres.

FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI
Sealed Surface Details														
Prog	Ck	Ck	St	Bit	Pat	Tex	Saf	Edg	Usr	Usr	Usr	Usr	Usr	Seal
Cond	Ext	Sev	Strp	Ox				Brk	Def	Def	Def	Def	Def	Area
0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	Fld	Fld	Fld	Fld	Fld	
6.06	4	3	1	**3.5**	4	2	0	4						2,728

Fig. 17 Sealed Surface Condition Factors

4.3.85 Column FU Seal Program Condition.

This 0 -10 condition figure is generated via a formula that acts upon the other seal condition factors. The program gives a four times weighting to “oxidation” and a 2 times weighting to texture. However, texture does not impact on the formulae until it reached condition 3. Texture only kicks in when there is a bitumen deficiency present that will impact of the service life of the seal.

The formula is contained within cell FU11on the Master Sheet and can be amended to meet specific needs. But we are not aware of any users that have amended the formulae.

The seal distress factors that come together to make up the program condition are all rated on a 0 – 5 scale. This is closely related to the Vic Roads standard and the individual details for each parameter are detailed below.

4.3.86 Column FV Seal Cracking Extent.

Pavement and seal cracking is an important factor in the overall health of both the pavement and the sealed surface. The extent of cracking is a measure of the extent of the cracking problem over the whole of the seal segment the following is a guide to the assessment of the 0-5 factor.

- Condition 0 No cracking visible over the segment
- Condition 1 Cracking evident in isolated location or very small number of locations.
- Condition 2 Cracking evident over say 10-30% of the segment
- Condition 3 Cracking evident over 30-50% of the segment
- Condition 4 Cracking evident over 50 - 70% of the segment area
- Condition 5 Cracking or block cracking evident over more than 70% of the segment area.

4.3.87 Column FW Seal Cracking Severity

This factor is a measure of how severe or wide the cracking is. For example a very fine system of cracking over the whole of the seal may not be as bad as a very severe cracking over only 40% of the area. The following details are provided as a guide to the selection of cracking severity condition.

- Condition 0 If no cracking visible over the segment
- Condition 1 Fine cracking less than 0.5 mm in width
- Condition 2 Fine cracking up to 1.0 mm in width
- Condition 3 Cracking between 1.0 - 5.0mm
- Condition 4 Cracking Between 5.0 & 10.0 mm
- Condition 5 Severe cracking Greater than 10mm in width.

4.3.88 Column FX Seal Stripping.

The stripping or stone loss of the sealed surface includes not only the classic loss of aggregate from a chip seal but also includes the loss of aggregate and other finer material from an asphalt surface. Below is a guide to the assessment of the Stripping condition.

- Condition 0 - No stripping or stone loss visible over the segment
- Condition 1 - Only very minor stripping evident in isolated locations
- Condition 2 - If isolated stripping evident at several locations throughout the segment or major stripping in an isolated area. Also if there is a general but very light loss of some of the fine material from an asphalt surface.
- Condition 3 - If stripping evident to a light degree over the whole of the segment or major stripping in multiple isolated areas. For asphalt surfaces the loss of material would be general and would be greater than the fine material and would be beginning to include a small portion of the largest nominal sized aggregate in the mix.
- Condition 4- The loss of aggregate in chip seals would be general and severe while for asphalt the loss of material would include a large portion of the largest nominal sized aggregate within the upper portion of the asphalt surface.
- Condition 5 - Aggregate loss in both asphalt and chip seals would be general across the segment and extreme.

4.3.89 Column FY Bitumen Oxidation.

This is the most important of the surface condition factors and is perhaps the most difficult to deal with. The bitumen that holds the aggregate in place within a bituminous chip or spray seal oxidises and becomes brittle with age. There is no substitute for experience in this area. Many years of looking at sealed surfaces

and particularly at the same surfaces year after year and knowing their age and having your own previous notes and ratings provides the best background. Oxidation is linked to age and so if you have age records for a seal then these should be consulted. However, age alone is not the best measure of oxidation

After many years of undertaking these tests we have come up with what we consider to be a good and consistent approach.

4.3.89.1 Bitumen Oxidation Preheat Method for spray seals

Preheat a small area of the surface to around 60 degrees and check the temperature with a non-contact infrared thermometer. With a chisel or screwdriver and hammer dig out a piece of the seal and examine the bitumen around the top layer of stone only. Allocate an oxidation condition based upon your own experience, or use the following descriptions as a guide

- Condition 0 - Bitumen strings for at least 100 mm and is extremely sticky to touch and is difficult to remove from the fingers.
- Condition 1 - Bitumen strings for up to 75 mm and is extremely sticky to touch and is difficult to remove from the fingers.
- Condition 2 - Bitumen strings for around 25 to 50 mm and is tacky to touch
- Condition 3. - Bitumen draws into points about 5 - 10 mm long away from the stone and is still black and smooth in appearance.
- Condition 4. - Bitumen will not draw from the stone for more than a few millimetres.
- Condition 5 - Bitumen appears dull and has no shine or stickiness and does not draw from the stone at all.

4.3.89.2 Bitumen Oxidation Cold test Method – Not Recommended

A screwdriver or similar device that is capable of plucking out a stone from the seal is very useful in assessing the level of oxidation of a chip seal. The extent of lively bitumen that is associated with the seal profile is a good indication of the remaining life of a seal. For Asphalt surfaces the loss of surface material and aggregate is the best indicator of badly oxidised surfaces.

The testing of bitumen oxidation should not be undertaken in very cold weather. If at all possible this test should be done through the warmer months and at the same time of the year for each successive survey. The following is provided as a guide to the selection of bitumen oxidation in the field. Note that the program will accept fractions for this condition rating and in some instances you may wish to use 0.5 increments between the whole number condition factors.

Because of the temperature sensitive nature of the oxidation test it is recommended that these tests be undertaken within a consistent ambient temperature range of 10 degrees and commencing no lower than around 18 degrees Celsius.

- Condition 0-1. A new seal with full depth of lively bitumen in the screwdriver test. Typically it is a seal up to 3 years of age. Asphalt surfaces in this condition would look new and still have a relatively black overall appearance with no loss of surface material they would also generally be under 3 years of age.
- Condition 2 A seal that is showing only limited signs of age and has up to about 30% of its full depth crystallised in the screwdriver test. Asphalt surfaces would not have lost any material other than some very fine particles and would not appear as black in appearance as the condition 0-1 segments. Surfaces would be expected to be up to 5 years old.
- Condition 3. A seal in condition 3 would be showing some signs of distress. There would be up to 60% of the full depth of bitumen crystallised. Asphalt surfaces would be showing signs of the loss of fine material from the surface but this would not be extending down to include the large size aggregate accept in perhaps very isolated locations. A seal could be up to 7 years old, while asphalt could be up to 10 -15 years old.

- Condition 4. A seal that is generally over 7 years of age and is beginning to show obvious signs of distress by way of stone loss and small holes particularly on initial seals. Up to 80 % of full depth of bitumen crystallised. Asphalt surfaces would be exhibiting a high degree of loss of surface material including the loss of some of the largest nominal size aggregate in the mix over a high percentage of the full pavement area. Sealed and asphalt surfaces in condition 4 should be scheduled for resurfacing in the immediate future.
- Condition 5. At condition 5 the bitumen is close to fully oxidised and the surface is well past the time when it should have been retreated. Chip seals would be in great distress with a high level of stone loss and or patching. Asphalt surfaces would have lost a great amount of their surface material and there would be bad pitting over a large portion of the surface and perhaps a high level of surface patching. Good seal management practices should avoid a surface reaching this level of condition.

4.3.89.2 Bitumen Oxidation - Asphalt Oxidation

With asphalt surfaces the key to oxidation is the upper surface of the asphalt as once this has oxidised the surface will become progressively rougher as the fine material is lost. Once the loss of the larger nominal size stone within the upper surface of the asphalt is wide spread then oxidation has been allowed to progress beyond the desirable intervention point for surface retreatment.

The assessment of the oxidation or binder condition for a chip seal is a task that requires some experience. To some extent the rating system that you adopt is not important provided you are consistent. The preheat method is far superior to the cold method and should be used where ever possible. In all cases access to good historic seal records will greatly enhance the quality of the outcome.

4.3.90 Column FZ Surface Patching.

Assessed here is the degree of patching that has been undertaken as well as that which needs to be undertaken. The degree of seal surface patching that is present or needed to be undertaken is used as one of the means of establishing the overall seal condition. It is a seal condition distress indicator and hence both the extent of patches to the top seal as well as patches that are needed both contribute to this factor.

Patching that has been undertaken prior to the most recent reseal is ignored.

- Condition 0 No patching evident over the whole of the segment.
- Condition 1 Very little patching evident. (Even as low as one patch)
- Condition 2 Heavy isolated patching in one or two locations or light patching scattered at isolated locations over the segment.
- Condition 3 Heavy isolated patching in several locations or light patching spread out but extending over most of the segment.
- Condition 4 Heavy patching at frequent intervals over most of the segment or light patching at close (under 4m) intervals over the majority of the segment.
- Condition 5 Extensive heavy patching over most of the segment or light patching at very close intervals (under 1 m) over the whole or majority of the segment.

4.3.91 Column GA Surface Texture.

This item has been included as a means of recording the height of the existing bitumen level within a chip or spray sealed surface. There are a number of variations on the use of this factor by different authorities but the one that is recommended here is a measure of the level of the bitumen up the depth of the stone aggregate. The following is a brief explanation of the recommended rating for this factor. This condition primarily relates to a chip sealed surface. However it is also recorded for asphalt but here it tends to be closely related to the stripping or stone loss factor.

Texture is a very important factor for spray seals as it is a measure of the amount of bitumen present in the seal. It is often a trade off between getting the most bitumen on the ground and avoiding flushing problems. There is also a very important difference between the texture requirements for a highly trafficked highway and that of a lightly trafficked local road. High texture levels (low texture rating) is desirable on the lighter trafficked local roads while this may cause future flushing problems on high traffic roads.

For the lightly trafficked local road the more bitumen you can get onto the road without causing flushing problems the better. Total seal life will be greatly enhanced with high bitumen levels on local roads and the

ideal texture is within the range 1 – 2 while on highways it may be 3. Detailed below is a guide to the selection of texture condition for spray seals.

- Condition 0 A Flush surface condition with bitumen right up to or very close to the surface.
- Condition 1 A surface with an over supply of bitumen such that the level is generally 70% – 80% up the full depth of the Aggregate.
- Condition 2 A surface that is still bitumen rich with the level at or around 50-60% of the Full depth of the aggregate. This is the ideal texture for lightly trafficked local roads
- Condition 3 A seal with bitumen level of around 30-40% of the full depth of the aggregate. Ideal for highly trafficked roads.
- Condition 4 A seal with a low bitumen level of around 20% of the full depth of the aggregate. Some stone stripping would generally be evident because of the low bitumen level.
- Condition 5 A seal with a very low bitumen level of around 10% or less of the full depth of the aggregate. Extensive stone stripping would generally be evident because of the low bitumen level.

You may find that the assessment of texture on local roads is compounded by a vast variation across the road cross section. The seal may be flushed within the traffic wheel path and very low at the centre and edges of the road where little traffic movement is experienced. In such cases you need to bear in mind that the texture level is often used to assist in the selection of the stone size for the next seal treatment. High texture condition on a large stone would normally result in a small stone for the next treatment. Low texture condition would support the selection of a larger stone. Sometimes your call on the texture condition will be influenced by what size stone you think would best suite the next proposed treatment.

4.3.92 Column GB Safety.

This item has been included in order to identify locations such as intersection areas where the retreatment of a segment would be undertaken on the basis of safety rather than seal condition. For example a fully flushed seal at an intersection may be in a sound engineering condition but needs to be retreated to provide better skid resistance in the wet.

To some extent safety either is or is not an issue. The recommended condition scale is as follows.

- **Condition Factor 1** Safety not a real consideration within this segment.
- **Condition Factor 3** Safety a minor consideration within this segment.
- **Condition Factor 5** Safety a major consideration within this segment.

4.3.93 Column GC Edge Condition.

The extent of seal edge break is assessed on a 0 to 5 scale. This will normally be associated with non-retained seal edges. However in some cases edges can be lost against an existing kerb particularly if the overall condition of the seal surface has been allowed to oxidise to an excessive level. This variable does not contribute to the overall seal condition and has been included as a means of identifying and scheduling maintenance works.

In some cases the actual length on edge break in metres has been recorded here rather than a condition factor. If the edge condition factor is used the following table may be used as a guide to the selection of the condition factor.

- Condition 0 No edge breaks present
- Condition 1 Very minimal edge breaks present – under 1% of total length.
- Condition 2 Minor edge breaks under 5% of total length.
- Condition 3 Moderate edge breaks up to 10% of total length
- Condition 4 Extensive edge breaks over 10% of total length or severe breaks in terms of distance into the seal width over a lesser extent
- Condition 5 Extreme edge breaks in terms of both % of length affected and severity of seal width affected.

4.3.94 Column GD – GH User defined Seal Condition Factors

Provision has been made for the inclusion of other Seal surface condition factors here to meet particular requirements. If not wanted they may be hidden and ignored.

4.3.95 Column GI Seal Area

This field is calculated by the program and may be updated via the use of the "Update shaded cells containing formulae" program on the "Roads" drop down menu. The seal area is used in the calculation of valuation figures within the seal_2 file.

GJ	GK	GL	GM	GN	GO
Sealed Surface Treatments					
Last Treat.		Prop. Treat.			
Code	Const Date	Code	Prop Date	Width	Add Subt.
IS10	Jan-81	R7	Jan-07	6.20	10

Fig. 18 Sealed Surface Last & Proposed Treatment

4.3.96 Column GJ - GK Last treatment.

The last sealed surface treatment and the year that it was undertaken is recorded here. In the figure above the IS10 code represents an initial treatment prime and seal with a 10mm aggregate done in 1981. The detail placed within these cells is used to cost the replacement value of the existing seal for accounting valuation purposes and to assist with the selection of the next proposed treatment.

You may create any code that you want to use to describe a seal treatment and enter it within Table C3 of the Codes sheet. Once present within the codes sheet you may use the code within the master sheet.

4.3.97 Column GL - GO Proposed Next treatment.

The assessor is required to nominate the next proposed seal treatment and the year that the seal should be placed. The R7 Code in the table above indicates that the next proposed treatment is a 7mm Reseal to be undertaken in 2007. The seal condition report costing will be based upon the proposed seal and not the existing treatment.

If column GL is left empty the previous treatment in column GJ is assumed to be the next treatment. The next treatment may not be the same as the previous, but this assumption is considered to be the best available option.

You may also amend the width of the seal by placing your new proposed width within column GN. The add or subtract facility is the same as for other assets. That is if the proposed next seal falls short or goes past the segment definition points then you may amend the length here.

GP	GQ	GR
Seal General		
Date of Insp.	Comments Relating To Seal	GENERAL COMMENTS
Dec-97	Seal Flushed in Wheel Tracks	Consider placing K&C Through Cutting

Fig. 19 Seal General Comments

4.3.98 Column GP - GR Seal General Comments.

The date of the seal inspection is recorded in column GP. This item will become increasingly important as successive surveys are undertaken. The degradation of the assets will be logged against time allowing the development of unique asset degradation curves.

Column GQ is used to record any matters directly relating to the seal while Column GR is used for matters of an overall road nature.

GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB
GIS No.	Joint Wks Cap Prop	Rural or Town	Sealed or Un Sealed	DISTRICT LOCATION	Township Name Blanks are Rural	Road Status No.1	Traffic Count Details		
							COUNT	Percent Heavy Vehicles	Location or Other Description
	1.00	T	S		Newstead	TS	400	5	B5
	1.00	T	S		Newstead	TS	150	2	C1

Fig. 20 General Matters

4.3.99 Column GS GIS Number - ID

Reserves for the recording of unique GIS number for the segment. MS-Excel can be linked to a GIS system but it is more likely that this will be done within other applications.

4.3.100 Column GT Joint Works Capital Proportion

The default here is 1.0, which means that the whole of the capital liability rests with your municipality. If however you have a road on the municipal boundary then you can factor in your appropriate capital liability. In many cases this will be 0.5 but it could be that you split the road and take half each in which case you would enter a 1.00 for your portion and a 0.00 for the other. This way the whole story of asset liability can be shown and your accounts will accurately reflect the true capital liability.

This factor is only applied to the formation, pavement and sealed surface assets. It is assumed that footpaths and other assets will only be entered into the database if you are responsible for them. For example you would not enter the footpath on the side of the road that was within an adjoining municipality.

4.3.101 Column GU Rural or Township Designation

The R or T designation is placed here by the program following a consideration of the contents of Column GX. If GX is vacant it is assumed that the segment is a rural. If not then a township name would be entered into the GX Cell. The program updates this figure every time that you run the “Update shaded Cells Containing Formulae” Macro on the “Roads” Menu, or when running any operation from the “Run Sheet”.

4.3.102 Column GV Sealed or Unsealed Pavement Designation

This field is also program generated during the formulae update process. The decision is based upon the presence of a seal width within column FN. If there is no entry present it is assumed that the road is an unsealed road. If a width is present then it is assumed to be a sealed road. Additionally if there is no pavement width present in Column EH then the program delivers an “NP” classification in this field indicating that there in no Pavement present.

4.3.103 Column GW District Location

This column is used to designate a district location within the municipality. It could also be used to designate a sub region within a given township.

4.3.104 Column GX Township Name

The Township name is recorded here. Note that if no entry is made here then the program assumes that the segment is within a rural area and will designate it as such within column GU. Also if any entry is made then GU will be designated as Urban.

4.3.105 Column GY Road Status

This column is program generated during the running of the "Update Shaded Cells Containing Formulae" Macro. The program has 8 road categories that are used to describe the Status of the road assets. Detailed below are those 6 categories.

- TS Sealed Township Streets
- TP Unsealed Township Streets with Formation & Pavement
- TFO Unsealed Township Streets with no pavement Material - Formed only
- TNP Township with no pavement or formation present
- RS Rural Sealed Roads
- RP Rural Roads with Formation & Pavement
- RFO Rural Roads with no pavement Material - Formed only
- RNP Rural with no pavement or formation present

The program uses the results within Columns GU & GV and also requires that all of your pavements with no pavement material present be designated with a **Code Z** within the pavement code column (Column EG). The results within this column are used later to determine the road lengths by class of road within the "Road Lengths" report sheet of the St-Data2 File.

4.3.106 Column GZ - HB Traffic Count Details

These three columns are used to record the traffic count details. At present the information is being stored here for later use. However if you desired to take the information into account when setting priorities for works programs this could be done by altering the formulae that delivers the Weighted Pavement and seal condition factors within Columns EJ & FU. (See the section on the Hidden Copy Block for more information on this matter).

HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM
Road Hierarchy or Status Code	Road Status User Defined	Council Sub Division Area	Strategic or Bus Routs "S" "B"	Null Pave Length	MAP REFERENCE			Road No.		Data Coll. Sheet No.
					Map No.	Grid No.1	Grid No.2	Road No.	Seg. No.	
A1	1	Cas	S	**N**	56	A	2	5001	1	RP19
L2	6	Mal			57	A	3	4002	1	RP19

Fig. 21 General Matters Continued

4.3.107 Column HC Road Hierarchy Code

This is a user-defined field that is linked to table C12 within the "Codes Sheet". You may define as many road classifications as you wish and then assign a weighting to the whole class within the "Codes Sheet". The weighting is used to modify the "Program Condition" within the Condition sheet of the Seal and Pavement sub asset file so that the more important roads get a worse program condition for the same raw condition than the minor roads. It does not affect the condition within the valuation sheet and hence does not have any impact on asset valuations but does set higher priorities for capital works on the more important roads.

This facility enables you to assign desired weighting to the important roads without effecting the raw asset condition information. See "Codes Sheet' section for further details. The weightings are not applied at all within the Master Sheet only within the condition sheet of the sub asset files if so requested.

4.3.108 Column HD Road Status User Defined

This field is provided as a second road status classification for local use.

4.3.109 Column HE Council Sub Division Area

Sometimes it is useful to identify the subdivision of the council area that a road is located within. This can be a ward or a riding or any other sub set of the council district.

4.3.110 Column HF Strategic or Bus Routs

The Victorian grants commission requires certain strategic and bus routs to be identified within their statical returns each year. The embedded form within the “Road Lengths” Sheet of the St-Data2 file required this field to be in place. If all strategic routs are identified with an “S” and all bus route with a “B”(in column HF) then this information together with the traffic volume information within column GZ enabled the automatic generation of the grants commission form.

If you don’t need this facility then the field can become another user-defined field.

4.3.111 Column HG Null Pavement Length

If an “N” is placed within this field then the effect is to deliver a zero pavement length within column G of the Master Sheet. Any assets that are recorded within the active row will be valued and added to the overall database. It is only the pavement length that will be affected.

Total actual pavement length within a municipal district is often required to be quoted. This facility allows a great deal of flexibility with the system and still can deliver the actual overall pavement length. For example you may pick up car park details for valuation purposes but not add their length to the total road length. The pavements will all be valued within the pavement sub asset files but the car park length will not be added to the total pavement length in column G.

Another frequent use is to provide the facility to add in an additional segment to cover extra footpath or kerb details within one segment. Here you duplicate the base segment without the pavement details and enter in the additional other asset details. Then the “N” within column HG will ensure that the extra segment is not added to the total pavement length.

It is also useful in dealing with chainage breaks where the chainage of one road continues for a distance along another road before resuming. A null segment can be inserted into the system to explain the break in chainage without adding to the total pavement length. Similarly the footpath and kerb assets on a main road can be entered into the system without adding the pavement length to the total if the pavement is under the control of a state authority.

4.3.112 Column HH - HJ Map References and Co Ordinates

You may enter the Map reference of a road segment here. Note that all of these general items are copied to most reports although they may be hidden from view within the reports. You would need to use the standard MS-Excel unhide tool to view the details.

4.3.113 Column HK - HL Road and Segment Numbers

A unique road number for each road can be stored here together with a unique segment number for each segment of the total road. Many other databases relating to road assets use these references and it is also often used as a GIS link.

4.3.114 Column HM Data Collection Sheet No

It is a good idea to reference the data collection sheets to the database. If there are any later problems you will be able to quickly access the original data capture sheets.

4.3.115 Column HN & HO Internal Calculation Columns

These two columns are used within the program for the temporary storage of information during the running of the “Update Shaded cells containing formulae” macro and some other sub asset file programs. You should not place additional permanent data that you wish to record against the segment within these cells, as it will be lost during certain program operations.

4.3.116 Column HP & IK Road Register Details

Column HP is populated with the current date when you use the inbuilt program to generate new lines for data entry. It records the date that the record was created. Columns HQ to IK were added to cater for the requirements of the Victorian roads bill and to assist with the transfer of data between this program and the “RoadAsyst” SQL Program. You can use any of the fields from HQ to IF as user defined fields and if not using “RoadAsyst” this can be extended to IK.

4.4 Data Collection General

Before data collection is commenced you should spend some time to determine what outcomes you desire from the system. This can have a big bearing on the nature of the data that needs to be collected. Data collection is an expensive process and while any data item can be useful there is no need to pay for data that you will not be using. Once you have determined the data that you wish to pick up you can sort out a suitable method for collection and storage.

The question of direct electronic collection verses paper is really up to the user. There are advantages and disadvantages to both. We still find paper far quicker in the field and it also gives a final check of the data if data entry is undertaken by a competent operator.

4.4.1 Data Collection Segment Set up

It is recommended that you adopt a unique name for every road or street and a running chainage. The program then has the capacity to check for any chainage inconsistencies.

In order to retain the running chainage on the street segments you may wish to identify any additional segments that have been added to cover extra footpath or kerb assets with an identifier within the Street Name column (Column B). For example you may identify the street in Column B as (Smith St Extra Kerb). When the program sorts the data on the Master Sheet of the St Data2 File into alphabetic order than the extra lines will generally appear at the bottom of the street data if this approach is adopted. Alternatively if you do not change the name of the Street then the additional segment will appear under or above the duplicate segment with the same chainage.

All additional segments that are created to cater for extra sub assets beyond the scope of a single line of data entry should be identified within Column HG with an "N" to avoid their length being added to the total pavement length. (See the note on Column HG for more details).

The choice of segment boundary should be consistent and well defined. There are a number of choices here. Within the Urban area you could adopt property line to property line with the intersection area being assessed as a separate segment. Alternatively you could start at the property line and then go to the centre of the next intersecting street continuing this process until the last segment where you end at the property line again. A third method would be to start at the kerb line or edge of seal and to end at the edge of seal in place of the building line adopted in method two.

If you adopt a method that creates segment breaks at the centreline of intersecting streets it may be necessary to alter this set up and to create a special intersection segment from property line to property line to cover situations such as roundabouts. If a substantial asset such as a roundabout is contained within an intersection then this should be dealt with within a separate segment. You may choose to adopt either the property line or the median kerb end as the segment boundary. You would then record the chainage through the intersection in the normal manor and the Street Name from and to would be the same name.

We have found in urban areas that starting at property lines and using centre of intersecting streets then finishing at property lines is a sound practice. We include separate intersection segments if the treatment there is different to the remainder of the segment (eg a roundabout)

Whatever system you adopt it is important to maintain consistency to assist future assessors. However no system will cover all situations that you are likely to encounter and so there will be a need for exceptions. As long as you note these in the comments column there should be no future problems.

Within Urban areas it is recommended that you start the assessment at a property line and break the intermediate segments at the centreline of the intersecting street and end the Street at the property line. Special features within an intersection such, as a roundabout would be handled by the creation of a separate intersection segment as described above. This will provide a consistent approach that caters for most situations and is repeatable.

Within Rural areas it is recommended that you start and finish the chainage at the edge of the intersecting road pavement or seal. Your segment changes will be dictated by the changes in the Seal and the Pavement rather than the intersecting Roads. However, you should reference as many intersecting roads as possible in order to assist with later locations.

4.4.2 Data Collection Recording of segment details:

Each segment has a from point chainage a from point description as well as an end point chainage and end point description. The start point details for the next continuous segment will generally be the endpoint of the

preceding segment and as such does not need to be recorded. The “Master Sheet” is programmed to copy the end point data of the line above to the start point of the next segment. It is recommended within the urban area that the name reference for the start and end points of the segments be adopted as the intersecting streets. If you are duplicating a segment in order to add in additional sub asset data then it will be necessary to type in the starting point of the second segment as the program will have copied the end point details from the segment above into these cells.

A	B	C	D	E	F	G
Seg I.D. No.	ROAD OR STREET NAME	SEGMENT DETAIL				
		From		To		Total Pavement Length m
		Street Name or Description	Dist. m	Street Name or Description	Dist. m	
2050	Acacia Street	Lampard Street	0	Phillips Street	81	87
2051	Acacia Street	Phillips Street	81	Adam Way	199	275
2052	Acacia Street	Adam Way	199	Forest Street	288	106
2053	Acacia Street	Forest Street	288	Bend Left	420	101
2054	Acacia Street	Bend Left	420	Bright Street	516	30
2055	Acacia Street Extra Kerb	Phillips Street	81	Adam Way	199	0

Fig. 22 Example of Township Segment Set Up

The segment set up for Acacia St above is based upon a Block-by-Block system. Lampard Street at 00 would be the property line of Lampard Street within Acacia St. The First Segment ends at Chainage 81 m at the centre of Phillips St. Note that the Segment length is 87m and not 81. This is because there has been 6m added to the Add or Subtract distance within Column EI for the Pavement length. The reference chainage commenced at the property line but the pavement commenced 7 metres prior to the start of the property line.

The segments continue to be taken to the centres of the intersecting streets of Adam Way & Forest St then to a bend in the road before terminating at the property line at Bright Street. An additional segment with the name Acacia Street Extra Kerb has been created to accommodate some additional kerb information that would not fit within a single line of data entry. Note here that the Segment length for the additional segment is recorded as 0. This is achieved by placing an “N” within column HG on that same line.

A	B	C	D	E	F	G
Seg I.D. No.	ROAD OR STREET NAME	SEGMENT DETAIL				
		From		To		Total Pavement Length m
		Street Name or Description	Dist. m	Street Name or Description	Dist. m	
1200	Baley Road	00 at Ireland Road	0	Bend Right	1,540	1,540
1201	Baley Road	00 at Ireland Road	1,540	Pavement Change	2,400	860
1202	Baley Road	00 at Ireland Road	2,400	Araluen Road	3,920	1,520
1203	Baley Road	00 at Ireland Road	3,920	Seal Change	4,850	930
1204	Baley Road	00 at Ireland Road	4,850	5.88 Joel Road	6,010	1,160
1205	Baley Road	00 at Ireland Road	6,010	Back Creek Road	7,880	1,870

Fig. 23 Example of Rural Segment Set Up

Within the Rural area it is recommended that you start your chainage at the intersection of the two seals or pavements. Thus in the example above the 00 chainage would be where Ireland Rd and Bayley Rd pavements intersected. Note also that the street from description is “00 at Ireland Road”. The reason for this is that within the rural area some of the Segment descriptions will simply be “Seal Change” or “Pavement Change” and it may be difficult to know what the start reference was. You can enter the data in the normal way with the start reference the same as the above end reference and then convert the start reference to the “00 at” format for the rural areas from the “Roads Drop down Menu.

You will also note a small recording technique that has proved very useful in the past. Within the “street name to” at chainage 6,010m the description is “5.88 Joel Rd”. What this designates is that while the segment change occurred at chainage 6,010 from Ireland Rd there is a chainage reference of 5.88 Joel Rd. This technique avoids the creation of additional unwanted segments simply to record the chainage of an intersecting Road. Note also that the Chainage is placed first and then the Road name. This is because if the road name is long it may obscure the Chainage in a print out of the data and if the long road name is truncated then later users will still generally manage to identify the road.

4.4.3 Data Collection - Sheet:

There are four standard data capture sheets that can be used or modified to suite. It is recommended that you only place columns on the data capture sheet that you intend to use. Columns that are not being used will add confusion to the data capture process. You may need to modify the forms provided to suite your particular needs.

The one caution is that you ensure that the data capture sheet is in the same order as the data entry columns on the Master Sheet of the St-Data2 File.

It is likely that the assessor for the engineering assets will not be the same assessor as for the Street trees. Each user may also vary the items that are to be collected thus the creation of the Data Collection Sheet is to a large extent an individual process. If you require any assistance with this process please do not hesitate to contact the undersigned.

For the Second and subsequent data collection survey the **DATA RECOLLECT** Sheet within the **St-Data2** file has been provided so that you may view the old data as you undertake the update survey.

You may like to try a data logger or PC in the field but experience has shown that the extent of the data capture makes this process difficult to manage and the creation of new segments is quite complex.

4.5 St-Data2 File - The “Roads” Drop Down Menu

The St-Data2 File has its own unique drop down menu that enables access to the 75 program functions within the file. The Menu is located as follows:

Excel 2003 and earlier - Top of sheet next to Help Menu

Excel 2007 and Later – On the Add ins Ribbon

There are 5 levels to the drop Down Menu starting at Level 1 with the main menu titled “Roads”. Below that are 4 further sub levels. The diagram below is in 2 parts and illustrates the program functions that are available off the menu. There is an explanation below for each of the 77 Menu Item Numbers.

Item No	Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5
	Roads				
		1.Master Sheet			
1			*1. Add First new Line for Data Entry (Ctrl "a")*		
2			*2. Add subsequent Lines of data entry (Ctrl "z")*		
3			*3. Remove shaded blank lines between roads after data entry*		
4			*4. Update Shaded cells generated by Formulae*		
5			*5. Remove Highlighted row ro Deleted Segments Sheet*		
6			*6. Reverse the Chainage of the highlighted Road*		
			7. Formatting		
7				1. View Pavement and Seal Data	
8				2. View Footpath Date	
9				3. View Kerb Data	
10				4. View Tree Data	
11				5. View Street Furniture Data	
12				6. View All Columns (Ctrl Shift D)	
13				7. Set All Rows to Standard row 11 format	
14				8. Highlight Joint works segments in Column G	
15				9. Place field comments on Row 18	
16				10. Set Heavy lines between Roads and Asset types	
17				11. Set From Description in Column C to 00 at Format	
18				12. Set From Description in Column C to Standars Format	
			8. Validate Data on Entry		
19				1. Set up Data Entry Validation	
20				2. Remove Data Entry Validation	
			9. Sorting		
21				1. Alphabetic Road Name	
22				2. Town Name Then Alphabetic Road Name	
23				3. Road Status Then Alphabetic Road Name	
24				4. Descending Segment ID No.	
25				5. Select all data for a manual Sort (Ctrl x)	
			10. Road Hierarachy Weightings		
26				1. Apply weightings to seal and pavement	
27				2. Apply weightings to Seal Only	
28				3. Apply weightings to Pavement Only	
29				4. Remove weightings	
		2. RunSheet Update Sub asset Files			
30			*1. Run all Reports Nominated with "Y" in table 1*		
		3. Reports within this file			
31			*1. Road Lengths Sheet Update*		
32			*2. Road Register Sheet Update*		
33			*3. Road Register Segment Details Sheet Update*		
34			*4. Class Valuation Sheet Update*		
35			*5. Road Condition Sheet Update*		
36			*6. Clear all reports from File (Not Master and Codes Sheets)*		

Figure 24 Roads Drop Down Menu Set up Part 1

Item No	Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5
		4. Post Data Entry Validation			
37			*1. Test All Fields*		
38			*2. Test all Codes and Numbers*		
39			*3. Test Footpath Fields*		
40			*4. Test Kerb Fields*		
41			*5. Test Pavement and Formation Fields*		
42			*6. Test Sealed Surface Fields*		
43			*7. Test Street Furniture Fields*		
44			*8. Test Segment Dimension and General Fields*		
45			*9. Test Asset Register Fields*		
		5. Oter Data Tests			
46			*1. Test Column Value 0 - 10*		
47			*2. Test Column Value 0 - 5*		
48			*3. Test Column Value 0 - 3*		
49			*4. Test Column Value > Zero*		
50			*5. Find Next Blank Cell in Column*		
51			*6. Find Duplicate Road Names (Column B)*		
52			*7. Check for Duplicate ID 'No (Column A)*		
53			*8. Find Non Continuous Chainages*		
		6. Data Recollection			
54			*1. Set up Initial Data Recollection Sheet*		
55			*2. Format Sheet with Large Row Spacing*		
56			*3. Format Sheet with Small Row Spacing*		
57			*4. Format for Footpath Collection*		
58			*5. Format for Kerb Collection*		
59			*6. Format for Street Tree Collection*		
60			*7. Format for Street Furniture Collection*		
61			*8. Format for Pavement Collection*		
62			*9. Format for Sealed Surface Collection*		
63			*10. Format for Seal and Pavement Collection Collection*		
64			*11. Clear all Data From Sheet*		
		7. Common Functions			
			1. Active Sheet		
				1. Autofilters on and Off	
65					On (Ctrl e)
66					Off (Ctrl r)
				2. Freeze Panes	
67					On (Ctrl Shift E)
68					Off (Ctrl Shift R)
				3. Protection	
69					No (Ctrl Shift P)
70					Off (Ctrl Shift U)
71					4. Select All Data for a Manual Sort (Ctrl x)
72					5. View All Columns on Master Sheet (Ctrl Shift D)
73					6. Paste Special Values Only after a Copy (Ctrl q)
			2. Master Sheet		
				Hidden Copy Block	
74					Show (Ctrl Shift H)
75					Hide (Ctrl h)
		8. Backup			
76			1. Copy All Unique Data to Backup File		
77			2. Replace Unique Data From Backup File		

Figure 25 Roads Drop Down Menu Set up Part 2

4.5.1 Drop Down Menu Detailed Explanation of Menu Items

Within the two tables above are the details of the 77 individual Program functions that can be accessed from the unique drop down menu within the file. Some commonly used items have short cut key operations and these have been identified within the table in brackets at the end of the program command. For example put of the Autofilters (ctrl e).

Each menu operation has been allocated an item number in the above 2 tables (the number will not appear on the menu it is simply there to identify the explanation of the program function below).

Item No	Explanation
1	Adds the first line of new data for a new road or street entry
2	Adds the second and subsequent lines of blank data for a new road. You repeat this operation till you have enough blank rows for the road you wish to enter
3	Each new road that is created with the above 2 commands is separated by a shaded and protected blank row so that assists in keeping the new data entry away from the main body of the existing data set. When you have completed the data entry for the new road this operation will remove the blank line and then sort the new road into alphabetic order within the data set
4	We do not keep any active formulae within the main database on the Master Sheet. This program applies the formulae (stored in the Hidden Copy Block at row 11) and then saves the results as values only.
5	It is recommended that you do not simple delete a row of data on the Master sheet if you no longer require it there. This operation transfers the row of data to the “Deleted Segments” Sheet where it is no longer part of the asset base but the old details can be assessed. Provided you have any cell within the segment active that is the row that will be deleted
6	This function reverses the chainage of any road. You activate it with the active cell in any part of the road to be reversed and it will reverse the chainage of all segments within that road. In addition to this it also switches the side for the footpath and kerb assets and sorts out the to and from references including the fixing of the recording of the km distance reference with the to and from descriptors.
7	Formats the master Sheet so that only the base data within the columns relating to Pavement and seal are visible.
8	Formats the master Sheet so that only the base data within the columns relating to Footpath are visible.
9	Formats the master Sheet so that only the base data within the columns relating to Kerb are visible.
10	Formats the master Sheet so that only the base data within the columns relating to Street Trees are visible.
11	Formats the master Sheet so that only the base data within the columns relating to Street Furniture are visible.
12	Un hides all columns on the Master Sheet or any other active sheet
13	This function copies the formatting of the “Hidden Copy Block” in row 11 and pastes it to whole of the Master Sheet. You can amend the formatting in Row 11 to suite your needs and then use this function to apply it to the whole Sheet below row 21
14	Within Column GT of the Master Sheet is a field that allows you to allocate a proportion of the pavement and seal value that is less than 100%. The default is 1.0 which allocates 100% to you but you could place a 0.5 here and it would allocate only 50% to you.
15	Located within the “Invalid Entries Sheet on Row 17 are a series of Excel comments for every field on the Master Sheet. This operation brings then to the Master Sheet. They will be removed when you put on the filters on the Master Sheet. The comments are designed to provide a strong

	background of information that should avoid the need to go to the manual in many cases.
16	This operation amends the formatting of the Master Sheet so that it mirrors the “Data Recollection” Sheet. The idea being that clear separation between different roads and logical parts of the sheet will greatly assist data entry. This function then sets the Master sheet formatting to the same as the Data recollection sheet which greatly assists data entry from fiend sheets in the same format.
17	This function sets up the Start reference description in Column C to describe the 00 Start point for the road for all segments. It does it only in the rural area and can be very helpful in some situations
18	This function sets up the Start reference description in Column C back to standard and reverses the above function.
19	Sets up the Data validation to check for errors on entry. Note that Excel can only validate to a list of the same worksheet so with the checking of all of the Codes a copy of the codes is brought to the Master Sheet form the codes sheet as this process is set up. Thus if you ass a new code after set up it won’t be validated. Note also that Validation on entry cannot check for missing data. This can be achieved with items 37 – 45 below once data entry is complete.
20	Removes the validation of data at the point of data entry
21	Sorts the Master Sheet data into straight alphabetic order in Column B followed by chainage in Column D
22	Sorts the Master Sheet data first by Town name in Column GX then by straight alphabetic order in Column B followed by chainage in Column D
23	Sorts the Master Sheet data first by Road Status in Column GY then by straight alphabetic order in Column B followed by chainage in Column D
24	Sorts the Master Sheet data in Descending ID Number in Column A and allows you to see the highest ID No.
25	Selects all data on the master Sheet ready for a Manual Sort
26	Applies the road hierarchy weightings that you have applied within Table C12 of the codes sheet to both the pavement and seal program conditions in Columns EJ and FT of the Master Sheet. The process allows you to put a weighting on the more important roads. This facility is also available within the pavement and seal sub asset files and is more likely to be applied there. Applying the weightings here will NOT carry them through to the sub asset files as the program updated all cells generated by formula on the Master Sheet in the normal way before sub asset files are run.
27	Applies 26 to Seal assets only
28	Applies 26 to Pavement assets only
29	Removes the road hierarchy weightings
30	This command runs all of the programs you have nominated with a “Y” within table R1 of the Run Sheet. It is where the Sub asset files are updated from the source date within the St-Data2 file.
31	Updates the Road Lengths report sheet in St-Data2 from the Master Sheet
32	Updates the Road Register report sheet in St-Data2 from the Master Sheet. The road register provides a single line record of each road (irrespective of how many segments it is made up of).
33	Updates the Road Register Segment Details report sheet in St-Data2 from the Master Sheet. This report provides a summary of the full segmentation detail within the Master Sheet.
34	Updates the “Class Valuation” Sheet. This sheet provides a summary of all asset valuations grouped by sub asset type and then Code type within each sub asset.

35	Updates the “Road Condition” Sheet. This sheet provides a graph of the condition change for all assets along the full length of a single road. With an active cell selected anywhere within a given road on the Master Sheet this program will produce the report for that road.
36	Clears all reports within the St-Data2 file. But does not affect any unique data within the “Master Sheet” or “Codes” Sheet
37	Tests all fields on the Master Sheet for errors and reports the results within the “Invalid Entries” Sheet. Errors are reported on with cell location as well as the nature of the error. On the “Invalid Entries” Sheet there is a legend between A8 and A10 that explains the relative importance of the reported errors. Some MUST be fixed, others should be fixed as they will have an impact but wont stop the program and others are information fields only and it is up to you if you deal with them.
38	Validates data as per 37 above but tests all Code and numeric Fields only.
39	Validates data as per 37 above but tests only the Footpath related fields. Very useful if you have only amended footpath details in the Master Sheet.
40	Validates data as per 37 above but tests only the Kerb related fields.
41	Validates data as per 37 above but tests only the Pavement and Formations related fields.
42	Validates data as per 37 above but tests only the Sealed Surfaces related fields.
43	Validates data as per 37 above but tests only the Street Furniture related fields.
44	Validates data as per 37 above but tests General Fields and Dimensions only
45	Validates data as per 37 above but tests only the Asset Register fields
46	Tests a single column starting at Row 22 for a value 0 – 10. Place the active cell at row 22 in the desired column and then activate the program. It will stop at an error or the bottom of the data set
47	Tests a single column starting at Row 22 for a value 0 – 5. Place the active cell at row 22 in the desired column and then activate the program. It will stop at an error or the bottom of the data set
48	Tests a single column starting at Row 22 for a value 0 – 3. Place the active cell at row 22 in the desired column and then activate the program. It will stop at an error or the bottom of the data set
49	Tests a single column starting at Row 22 for a value > 0. Place the active cell at row 22 in the desired column and then activate the program. It will stop at an error or the bottom of the data set
50	Tests a single column starting at Row 22 for a Blank Cells Place the active cell at row 22 in the desired column and then activate the program. It will stop at a blank cell or the bottom of the data set
51	This program will find and shade any duplicated road names. It is recommended that you maintain a unique road name for every different road. In this way the check within Item 53 for non-continuous chainages can be undertaken.
52	Checks for Duplicate ID Numbers in Column A of the master Sheet. These should all be unique.
53	Checks for non-continuous chainages in each road. That is the to chainage should equal the from chainage for the next segment in the same road. Chainage breaks can be a problem or an error and this test will identify them for you and allow you to sort them out.
54	This program sets up the “Data Recollection” Sheet. The sheet formats the “Master Sheet” data in a way that is both printer friendly and formatted for ease of field data collection. It is used on a second or subsequent condition assessment of the assets and can be easily formatted for a single sub asset set. The order within the sheet will be the same as the “Master Sheet” so ensure that it is in the order you want before activating the program.
55	Formats the “Data Recollection” Sheet with large line spacings
56	Formats the “Data Recollection” Sheet with small line spacings

57	Formats the “Data Recollection” Sheet for Footpath Sub Asset collection
58	Formats the “Data Recollection” Sheet for Kerb Sub Asset collection
59	Formats the “Data Recollection” Sheet for Street Tree Sub Asset collection
60	Formats the “Data Recollection” Sheet for Street Furniture Sub Asset collection
61	Formats the “Data Recollection” Sheet for Pavement Sub Asset collection
62	Formats the “Data Recollection” Sheet for Sealed Surface Sub Asset collection
63	Formats the “Data Recollection” Sheet for Sealed Surface and Pavement Sub Asset collection
64	Clears all data from the “Data Recollection” Sheet. This minimises the file size and should be done if it is no longer needed.
65	The first of several commonly used standard Excel functions that has been programmed in for easy access. This one sets up the Autofilters at row 22 on the active sheet (any sheet any file) Short Cut (Ctrl e)
66	Removes Filter Short Cut (Ctrl e) – or (Ctrl e)
67	Freezes the panes in any excel sheet to show the title rows 14 – 21 and the first 4 columns Short Cut (Ctrl Shift E)
68	Removes the Freeze Paves Short Cut (Ctrl Shift R)
69	Protects the Active sheet – Short Cut (Ctrl Shift P)
70	Removes Protection from the Active sheet – Short Cut (Ctrl Shift U)
71	Selects all data below row 22 on any sheet ready for a manual sort Short Cut (Ctrl x)
72	Displays all columns on the Active Sheet (un hides the hidden ones) Short Cut (Ctrl Shift D)
73	Activated the “Paste Special Values Only” Excel Function after a copy command Short Cut (Ctrl q)
74	Displays the “Hidden Copy Block” The Hidden Copy Block is located within the hidden row 11 and contains all of the cell formulae and cell formatting for the data within the Master Sheet. You can amend formatting and or cell formulae within this row and pass it onto all data within the Master Sheet from the two Command Numbers 4 and 13. See above for details. Short Cut (Ctrl Shift H)
75	Hides the “Hidden Copy Block in Row 11 of Master Sheet Short Cut (Ctrl h)
76	Copies all unique data within the St-Data2 file to the backup file. This covers; Master Sheet, Codes Sheet, Deleted Segments Sheet and User defined Notes Sheet.
77	First clears all unique data from St-Data2 and then replaces it with corresponding data from the Backup File. Used for two purposes. First to act as a backup system for your St-Data2 file and Secondly to enable the population of an updated empty program file. This

4.5.1.1 Summary of Menu Items with Short Cut key Access

The following is a summary of the St-Data2 Program menu items that can also be accessed via short cut key operations.

1. Protect Active Sheet (Ctrl Shift P)
2. Remove Protection from active sheet (Ctrl Shift U)
3. Set up AutoFilters (Ctrl e)
4. Remove AutoFilters (Ctrl r)

5. Freeze Panes to View Data (Ctrl Shift E)
6. Remove freeze panes (Ctrl Shift R)
7. Select all data for a Manual Sort (Ctrl x)
8. Display Hidden copy Block on Row 11 (Ctrl Shift H)
9. Hide Hidden copy Block on Row 11 (Ctrl h)
10. View All Columns on Master Sheet (Ctrl Shift D)

The hidden copy block is located on row 11 of the Master Sheet and is the template from which new rows for data entry are created. It can also be used to update formatting from that row to the whole of the data set.

4.6 Data Entry

This section will deal with the basics of the data entry process.

4.6.1 Generating the Data Entry Block for new roads

All Data entry other than amendments to codes and unit rates is undertaken within the "**Master Sheet**" of the "**ST-DATA2** " File. Open the ST-DATA2 File and go to the "Master Sheet". From the **"Roads"** drop down menu use reference items 1 and 2 (See Figure 24A and section 5.5.1 above for more details) and create an empty data entry block for your new road. Note that there are short cut keys (Ctrl a and Ctrl z) for this action.

Then work your way across the spreadsheet entering the data for the road as appropriate. While the roads remain in this segmented form with the blank lines between newly entered roads the shaded cells that are generated by formulae will retain with active formula. Once you activate the program that removes the blank lines then the formulae will be replaced with the resulting values only.

Tip: Hide the columns you are not using and set the Master Sheet to same format as data collection Sheet

4.6.2 Removing Blanks B/W Roads

Upon the completion of the data entry process or at other intervals as desired you will need to remove the blank spaces between the road & street segments. This is done from the program from the "Roads" drop down menu. Item 3 above.

The purpose of the space between the street segments is to assist with data entry. This is particularly useful when entering data for a Street with many segments. Once the Remove Blanks Program has been run the active formulae within the data set of the Master Sheet are removed and replaced with values only. To update the formulae again see Drop Down Menu Command No 4.

Formulas are removed because there is no guarantee that an active formula is correct and working. It also helps to minimise the file size and assists with program speed.

4.6.3 The Run Sheet and Updating the Sub Asset Files

The Run Sheet is the location within the St-Data2 file from where the sub asset file programs are updated.

The program was amended in August 2016 to allow for the written down value of assets based on their age. Up until this time all asset valuations were undertaken based on condition. If asset condition has been accurately assessed then it is felt that valuations based on condition will deliver the best results. However, asset valuations based on the age of the assets could prove simpler to understand and to manage.

Also, as asset valuations based on the international accounting standards are virtually meaningless in terms of the ongoing financial management of the assets it will possibly be simpler in the future to adopt age based valuations for accounting purposes as there will be a need to run separate financial reporting that is linked to the actual ongoing future liability associated with the assets.

Thus in Table R1 below, the first decision will be, are the asset valuations to be based on age or condition. "Yes" on column O (second from Right in table below) will set for age based valuations "No" will set to condition based valuations.

Table R1	Last	Reports to be Run		Valuation Date	Adj. WDV for Time since Insp.	Set Ann Dep to 0 if WDV = 0	Set WDV Based on Age	Date Run for Age based WDV
Prog. Run Options	Update	Place a "Y" in Column "I" against the Report options that you want to run		30/06/2016	No	Yes	Description of options 1 - 9 in Column I	
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				

Fig. 26 Table R1 on Run Sheet

Once the valuation methodology is decided you nominate within Table R1 the programs that you want to run with a “Y” in the green shaded cells (I4 to I12) as illustrated above. Then from the “Roads” drop down menu activate Item 30 (See section 4.5 above) to run all of the nominated sub asset reports.

At the top of the table are 3 green shaded cells that provide some additional program functionality if you are using the condition based valuation methodology. The two green shaded cells on the left of the table allow for asset annual depreciation since the time of the last condition survey to be taken from the WDV. You MUST have dates of inspection for all assets and sub assets entered into the Master Sheet in Excel Date format and the required valuation date MUST be later than the condition inspection date.

Important Note: At the top of Table R1 are 2 green shaded cells that enable you to allow for annual depreciation since the time of the last inspection to be accounted for.

Place a "No" in cell L2 if you don’t want to calculate the addition depreciation since the time of the survey. This action will deliver a snapshot of the asset valuations as at the date of the condition assessment.

"Yes" in Cell L2 will allow for any additional annual depreciation between the data of the condition assessment and the required valuation date in Cell J2 (30/6/2016 in the above table). Note that cell J2 is also used as the valuation date it you are establishing the WDV based in asset age.

Cell N2 on the right of the table required a "Yes or No". If the asset is fully depreciated with a zero present or written down value then "Yes" will deliver a zero annual depreciation and "No" will deliver the normal annual depreciation based on Replacement value / Life in years. For accounting purposes it would be normal to have this as "Yes".

Results are stored and saved within the sub asset files with the key overall valuations being returned in summary form to the Run Sheet. Asset valuations and condition reports are all undertaken within the sub asset files and changes made within the St-Data2 file will not be transferred to the sub asset files until those reports have been run from the Run Sheet as detailed above.

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	55,027	Lin. Met	74,815	sqm	3.661	5,373,104	68.5	2,562,127	2,810,977	81,106	81,106	12-Aug-16	25-Jun-16	1,110
Kerb	79,092	Lin. Met			3.768	8,484,220	78.8	4,487,172	3,997,048	107,222	107,222	12-Aug-16	25-Jun-16	1,468
Sealed Pavements	177,220	Lin. Met	1,278,248	sqm	3.594	48,443,039	76.0	26,641,601	21,801,437	677,786	677,786	12-Aug-16	25-Jun-16	73,119
Unsealed Pavement	96,193	Lin Met	422,138	sqm	1.059	4,942,185	20.0	4,284,632	657,553	244,919	244,919	12-Aug-16	25-Jun-16	3,353
Sealed Surface	177,220	Lin. Met	1,120,205	sqm	3.451	9,832,679	22.1	5,306,393	4,526,286	430,780	405,170	12-Aug-16	25-Jun-16	5,897
Sealed Rd Formation	177,220	Lin. Met	1,547,148	sqm	0.000	5,905,320	100.0	5,905,176	144	2,953		12-Aug-16	25-Jun-16	144
U/S Rd Formation	96,193	Lin. Met	692,533	sqm	0.000	5,135,536	100.0	5,135,501	35	2,568		12-Aug-16	25-Jun-16	35
Street Furniture	22	No			2.407	7,500	22.5	5,334	2,166	360	360	12-Aug-16		381
TOTAL VALUATIONS						88,123,582		54,327,936	33,795,647	1,547,693	1,516,563			85,486

Fig. 26 Table R2 on Run Sheet – Summary of Asset Overall Valuations

Figure 26 above shows the valuation summary that comes back to the Run sheet after the running of the sub asset files from that sheet. In this case we are reporting WDV based in condition and we have asked for the additional annual depreciation since the time of the condition survey to be calculated (and added to the

accumulated depreciation). Note that for reference purposes the extent of the additional annual depreciation is stored in the far right column. With the date of inspection being only 5 days from the required valuation date the additional annual depreciation in the last column is quite small.

The inspection dates in figure 26 do not all need to be the same they were set that way for ease of understanding of the process. Within the one sub asset set you may have many different inspection dates. The program calculates the additional depreciation for each individual asset and hence takes into account the actual date for each individual asset. The date reported in Table R2 is simply the average of all of the dates.

4.6.4 Sub asset file Reporting of Valuations

If you have selected to base the asset valuations on the age of the assets within the "RUN" sheet, then within the sub asset files there will be two sets of valuations. The valuations based on condition will still be there and then at the extreme right of the "Valuation" sheet within each of the sub asset files you will find the last four columns dealing with the valuations based on age.

546		48,443,039	**76**	26,714,720	21,728,319	677,786	**36.70**	**39.27**	21,823,583	681,189

$48,443,039

Valuation Date 30/06/2016

Seg I.D. No.	ROAD OR STREET NAME	Pavement Valuations					Age Based Valuations			
		Replace Value $	Asset Life Years	Written Down Value	Accum. Dep.	Annual Dep.	Asset Age in Years	Rem Life Years	Age Based WDV	Annual Deprec.
127	Adams St	25,155	80	15,722	9,433	314	47.58	32.42	10,195	314
781	Adams St	49,140	80	30,713	18,428	614	47.58	32.42	19,915	614
657	Adams St	8,483	80	8,483	0	106	47.58	32.42	3,438	106
394	Bellingham Rd	201,000	60	74,747	126,253	3,350	50.58	9.42	31,560	3,350
395	Bellingham Rd	201,000	60	47,903	153,097	3,350	50.58	9.42	31,560	3,350

Fig. 26A Sample of the two reported valuations in Sub Asset Files

Figure 26A provides a sample of the valuation reporting within the "Pave_2" file for the sealed road pavements. Under the sub heading "Pavement Valuations" are the valuations based on asset condition. Under the "Age based Valuations" heading, are the details of the figures relating to WDV based on age.

The age of the asset is simply the recorded date of construction taken from the required date of valuation (see green shaded cell above and as entered into Cell J2 on the “Run” Sheet). The remaining life is derived by taking the age from the adopted asset total life as recorded against each asset code in the "Codes" Sheet. In this case the top three pavement segments are town streets with a service life of 80-years, while the bottom two are rural pavements with a life of 60-years.

The WDV based on age is then calculated as the ratio of the remaining life to the total asset life. Annual depreciation is also reported under the "Age Based Valuations" because it can vary from the annual depreciation based on condition. For example an asset might be assessed as being in condition 7 and as such still be subject to annual depreciation based on condition, while the same asset has no remaining life based simply on age, because it is already older than the adopted service life and hence has no further annual depreciation.

In summary when we amended the software to enable the valuations to be based on age we did it as an add on. That is, we left the existing valuation results based in condition in place and if valuations based on age were nominated within Table R1 on the “Run” Sheet, the results are added to the "Valuation" sheet within each of the sub asset files and updated Table R2 on the "Run" sheet with the age based valuations.

4.7 St-Data2 file Reports: Road Cond Sheet

There are a number of inbuilt reports within the St-Data2 file as illustrated within the Drop Down menu section 4.5 above. Detailed below is a summary of the reports.

4.7.1 The Road Lengths Report Sheet

This report sheet contains a summary of the road lengths in the 6 basic road classifications that are used within the program. These categories are based on the rural urban split and then the sealed, unsealed and formed only (no added pavement material) groups as used within the grants commission reporting.

Detailed below is a sample of the table covering the road lengths report. The sheet also contains a table in the format required by the Victorian grants commission for road length reporting. Note that if you adopt our convention of naming service roads with an S/R somewhere within the road name in Column B and Parking Bays with a P/B, then the report will tally these lengths up as well.

Moloney Asset Management System

Road Length - Status Report

Table RL 1

Sheet Note

To show the Roadside Parking Bays and Service Rd lengths you must designate the name within Column B of the master sheet with a **P/B** and a **S/R**

The location of this text within the name does not matter as long as it is present

Table Last Updated 11/04/2012

Road Status or Description	Identification Code	Total Rd Length Within Class	Total Parking Bay Length	Total Service Rd Length
Township Sealed	TS	147,350	194	429
Township Unsealed	TP	106,574	0	791
Township Formed Only (No Pavement)	TFO	3,834	0	0
Total Township		**257,758**	**194**	**1,220**
Rural Sealed	RS	370,379	0	1,425
Rural Unsealed	RP	668,735	0	0
Rural Formed only (No Pavement)	RFO	5,236	0	0
Total Rural		**1,044,350**	**0**	**1,425**
	Total All Road Classes	**1,302,108**	**194**	**2,645**

Fig. 27 Road Lengths Report Sheet Details

4.7.2 The Road Register Report Sheet

The road register report (See Fig 28 below) provides a summary of all roads within the district. It the road is all contained within the one road register class then the report will have a single row for that road detailing the start and end and total length. If it contains more than one road register class as illustrated below for Acacia Rd then the road will be reported upon within its separate road register classes.

Seg I.D. No.	ROAD OR STREET NAME	SEGMENT DETAIL					Township Name Blanks are Rural		
		FROM		TO		Total		Public Rd "Y" Yes "N" No	Road Register Class
		Street Name or Description	Dist. m	Street Name or Description	Dist. m	Pavement Length			
3324	Acacia Rd	Creswick Newstead Rd	0	McMillans Rd	916	916	Broomfield	Y	LA
3	Acacia Rd	McMillans Rd	916	Driveway (140 Acacia Rd)	1,316	400		N	NM
3145	Acacia Rd	Driveway (140 Acacia Rd)	1,316	Frenchmans Rd	1,642	326		Y	LA
2820	Adcock Rd	Back Glenlyon Rd	0	Gate	160	160	Glenlyon	N	NM
3031	Adekate Camp Rd	Creswick Dean Rd	0	Camp Gate	570	570		Y	LA
4	Ajax Rd	Raglan St	0	Bald Hill Rd	3,560	3,565	Daylesford	Y	LA

Fig. 28 Road Register Report Sheet – Part only

4.7.3 The Road Register Segment Details Sheet

The road register segment details sheet provides a full report of every segment within the database. Note that Ajax Rd has 4 segments to Chainage 675 m while in 28 above it had only one for its full length of 3560. This is a very useful report when trying to locate segments in the field as it contains all of the references and chainages to assist you.

Seg I.D. No.	ROAD OR STREET NAME	SEGMENT DETAIL						Township Name Blanks are Rural		
		FROM		TO		Total	Pave		Public Rd	Road
		Street Name or Description	Dist. m	Street Name or Description	Dist. m	Pavement Length	Wid m		"Y" Yes "N" No	Register Class
3324	Acacia Rd	Creswick Newstead Rd	0	Change	300	300	3.0	Broomfield	Y	LA
2	Acacia Rd	Change	300	McMillans Rd	916	616	3.0	Broomfield	Y	LA
3	Acacia Rd	McMillans Rd	916	Driveway (140 Acacia Rd)	1,316	400	4.0		N	NM
3145	Acacia Rd	Driveway (140 Acacia Rd)	1,316	Start of seal	1,368	52	4.4		Y	LA
3146	Acacia Rd	Start of seal	1,368	End of seal	1,484	116	4.6		Y	LA
3147	Acacia Rd	End of seal	1,484	Frenchmans Rd	1,642	158	4.0		Y	LA
2820	Adcock Rd	Back Glenlyon Rd	0	Gate	160	160	3.0	Glenlyon	N	NM
3031	Adekate Camp Rd	Creswick Dean Rd	0	Camp Gate	570	570	4.0		Y	LA
4	Ajax Rd	Raglan St	0	Langdon Ct	120	125	7.2	Daylesford	Y	LA
5	Ajax Rd	Langdon Ct	120	Service Exit	210	90	7.2	Daylesford	Y	LA
6	Ajax Rd	Service Exit	210	Ranch Rd	350	140	7.2	Daylesford	Y	LA
7	Ajax Rd	Ranch Rd	350	End of seal	675	325	7.0	Daylesford	Y	LA

Fig. 29 Road Register Segment Detail Report Sheet – Part only

4.7.4 The Class Valuation report Sheet

This sheet splits the sub assets up into their various code types and then reports on the valuation and condition of each type within the sub asset group. Figure 30 below covers only the Footpath assets but all sub assets are reported upon within the sheet.

							Sheet Total and Average Figures	4.14	170,600,417	45.88	102,755,383	67,845,034	3,646,056
		Sheet Last Run 19/08/2011											
Sub Asset Group	ASSET DESCRIPTION	ASSET CODE	Measurement 1		Measurement 2		Average Cond.	Replace. Value $	Asset Life in Years	Written Down Value $	Accumul. Deprec. $	Annual Deprec. $
			Total Quantity	Units	Total Quantity	Units						
Footpath	Asphalt	AS	5,109	Lin. Metres	12,595	sqm	3.47	503,782	30	304,100	199,682	16,349
Footpath	Clay Brick Paving	BP	109	Lin. Metres	673	sqm	2.80	50,489	50	33,862	16,626	1,010
Footpath	Concrete 75mm	C75	25,109	Lin. Metres	39,013	sqm	3.70	2,340,754	50	1,479,626	861,128	46,815
Footpath	Concrete Pavers	CP	264	Lin. Metres	794	sqm	3.57	63,520	50	41,589	21,931	1,270
Footpath	Con. Paving Slabs	CPS	23	Lin. Metres	85	sqm	5.00	6,808	50	3,404	3,404	136
Footpath	Crushed Rock	CR	161	Lin. Metres	363	sqm	4.33	1,817	50	959	858	36
Footpath	Gravel	G	516	Lin. Metres	544	sqm	4.25	2,176	50	1,112	1,065	44
Footpath	Gravel	GR	245	Lin. Metres	326	sqm	6.00	1,305	50	533	772	26
Footpath	Pattern Concrete	PC	154	Lin. Metres	258	sqm	2.63	16,769	50	13,240	3,529	335
Footpath	Bitumenous Seal	S	842	Lin. Metres	1,526	sqm	3.63	53,396	50	35,458	17,938	1,068
Footpath	Stone Paveing	SP	47	Lin. Metres	389	sqm	2.00	54,460	50	43,568	10,892	1,089
Total Fig. For	**Footpath**		32,579		56,566		3.76	3,095,275	48	1,957,450	1,137,825	68,179

Fig. 30 Class Valuation Report Sheet – Part only

4.7.5 The Class Valuation report Sheet

This program has provision to supply an asset condition bar graph for all of the sub assets within a nominated road or street. To access this facility click into any cell on the master sheet within the road you wish to display. Then form the “Roads” Menu select Item 35 (Ref Sec 4.5).

Detailed below in Fig 31 is a plot of pavement condition along a 22 km long road. The end chainage and the pavement condition is reported upon for all segments within the road. There are graphs available for Pavement, Seal, Footpath left and right and Kerb left and right.

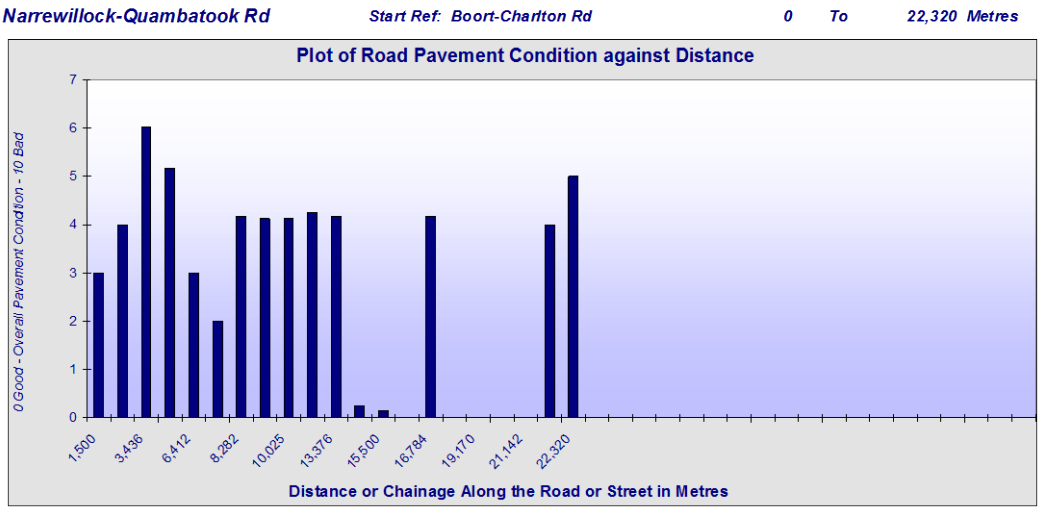


Fig. 31 Example of Road Condition Report Format

4.7.6 Clear All Reports within the Dt-Data2 File

The final function on the menu item that delivers the above 5 reports is one that will clear them from the file. This operation will not affect any base data it will remove the 5 reports that were generated from data within the Master Sheet.

4.8 St-Data2 file General Matters

There are a number of other matters associated with the use of the St-Data2 File that are worth mentioning as detailed below.

4.8.1 St-Data2 File - General Matters - Sheet Protection

Following the generation of new lines of data entry the program will automatically protect those parts of the sheet that do not involve immediate data entry. This is a protection mechanism that will assist you with data entry. For example all of the formulae generated cells will be protected so that you do not accidentally loose the formula. If you need to remove the protection to say hide a column or change the font size within a cell. You can use the Standard MS-Excel tools or the program provided on the drop down menu and also available via the short cut keystrokes as detailed below.

To Protect or Remove Protection on any sheet within any Road File.

Press **Ctrl Shift P** to add Protection.

Press **Ctrl Shift U** to remove Protection

These Protection and Removal of Protection Short cut Keys are common to all of the programs within the Roads and Streets Files.

4.8.2 St-Data2 File - General Matters - Amending the Hidden Copy Block

Each Time that you generate a new line for data entry the program copies the base data from the **"Hidden Copy Block"** and inserts it into a new line on line No.22. The Hidden Copy Block is located on line No.11 and is generally kept hidden from view along with Lines No.10 & 12.

The Hidden Copy Block is where the formulae that act upon the grey shaded cells of the data entry area are located. It is also the place that you would set up any default format settings that you wished to be copied to all lines of data entry. You may place any entry within the non shaded cells of the "Hidden Copy Block" and it will be repeated every time that you generate a new line of data entry. This function can save a lot of time in the data entry process by always placing an entry that is repeated often within each new data entry line.

For example you may be in an area where most of the streets have a C75 Code footpath on both sides that is 1.5 m wide. If you enter this data into the Hidden Copy Block then you will only have to remove the exceptions, as the program will generate new data rows with these fields completed.

The formulae contained within the hidden copy block are user definable and you may amend for example the formulae that delivers the Program condition for pavements if you have some more specific requirements than are covered by the default formulae. To access row 11 see Item 75 in Sec 4.5 above. Once amended you will need to update the formulae results in the rows below 22 (See Item 4 in Sec 4.5).

4.8.3 St-Data2 File - General Matters - Hiding Columns and Rows

It is often good practice to hide Columns of data on the Master Sheet that you are not currently using. This will cut down on confusion and minimise the accidental placement of data within the wrong column. You can also hide rows, however hiding rows can present a problem if you forget that they are hidden at some time. Thus apart from the Hidden Copy Block on Row 11 you should be cautious about hiding rows of data on the Master Sheet. Use the filters to temporarily hide rows then it will be obvious what has been done.

Often there will be columns within the Master Sheet that you will not be using or do not need to be visible during the Data entry process. It is a good idea to format the column sequence to replicate the Data entry sheet as closely as possible. This can be done by hiding the columns that are not required.

4.8.4 St-Data2 File - General Matters - Master Sheet Total Figures

Row No. 14 of the Master Sheet has a series of total and average figures that act upon the whole of the data set to give overall asset total and average figures. These figures are based upon MS-Excel Subtotal Formulae and as such will operate with the Autofilter to provide subtotal figures for the displayed data only.

This feature is common to all Sub Asset Files and is one of the most useful functions within the program. If you are not familiar with the Autofilter function then it is strongly recommended that you spend some time to acquaint yourself with its use.

If the subtotal figures are lost or damaged they can be restored via the “Roads” Drop Down Menu (See Sec 4.5 Item 4)

5.0 Sub Asset Files – Sealed Pavement as the example

The Sealed Pavement file is one of seven sub asset files that use the data within the “St-Data2” File to produce accounting and asset management reports specifically relating to a particular single sub asset set. The format of the seven files is very similar in nature but with specific variations to meet the needs of the particular sub asset under consideration.

To avoid unnecessary duplication the sealed road pavements shall be explained more fully than the remaining 6. With the unique differences within the other files dealt with in the sections that follow. The 7 Sub assets and their respective file names are as detailed below.

Sub Asset Set	File Name
Sealed Road Pavement	Pave_2
Un sealed Rd Pavement	UsPave_2
Sealed Surface	Seal_2
Footpath	Footph_2
Kerb	Kerb_ 2
Street Furniture	StFurn_2
Trees	Trees_2

5.1 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

5.2 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.

5.3 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 relevant codes 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.

5.4 Sealed Road Pavement - VALUATION Sheet

There is a detailed document titled "Road Asset Valuations August 2016" that covers all of the variables and adjustments that can be made within the Roads Module in relation to asset valuations. You are refered to that document for a more detailed explanation of the valuation methodology within the Moloney Roads Module.

The Sealed Road Pavement valuation sheet is initially generated by copying the required data from the St-Data2 file. The Sealed Road Pavement Codes Sheet is also transferred to the Sealed Road Pavement file during the running of the valuation report. The sealed road segments are separated from the unsealed and non-paved segments within the Master Sheet by testing for a width within column FN (Seale width field) of the master sheet. There must also be at least 2 sealed road segments for the program to pick up and transfer the data.

The Valuation Report provides full asset valuations for every segment of existing Sealed Road Pavement within the system. There is a separate valuation for each segment within each of the following categories.

- Replacement Value
- Written Down Value
- Accumulated Depreciation
- Annual Depreciation

5.4.1 Replacement Value

The replacement value is based upon the cost per square metre as detailed within the Sealed Road Pavement Code Block multiplied by the area of pavement as measured on site and entered into the master sheet.

5.4.2 Written Down Value

The written down value or present worth of the Sealed Road Pavement is derived by factoring back the replacement value, based upon the observed condition. At condition 0 the W.D. Value equals the Replacement Value and at condition 10 there is a Zero written down value. There is a straight-line link between the written down value and the observed Sealed Road Pavement Condition.

The code block provides the user with the ability to dictate at what condition the WDV will reach zero. Typically if assets were to be rehabilitated at condition 8 then the WDV should be made zero at that condition. This is a user definable feature that if not used will be set to 10, meaning that the WDV will be zero at condition 10. The zero point for the WDV is set within row 8 of the Codes Sheet.

Note that within Table R1 on the "Run" sheet of the "St-Data2" file the WDV can be varied by making allowance for the time between the actual condition assessment and a later required valuation date. See section 4.6.3 above for more detail.

Since August 2016 the program has had the capacity to set the WDV fully based on the age of the asset. A date of construction for all assets is needed. Then this date is taken from the required date of valuation to deliver the age of the asset. The age is then taken from the adopted service life of the asset to deliver a remaining life and the WDV is established by proportioning the remaining life against the total life.

546	**Tot & Av Fig**			Rd Length	48,443,039	**76**	26,714,720	21,728,319	677,786	**36.70**	**39.27**	21,823,583	681,189
	$48,443,039	177,220 m											

Valuation Date 30/06/2016

Seg I.D. No.	ROAD OR STREET NAME	SEGMENT DETAIL				Pavement Valuations					Age Based Valuations			
		FROM		TO		Replace Value $	Asset Life Years	Written Down Value	Accum. Dep.	Annual Dep.	Asset Age in Years	Rem Life Years	Age Based WDV	Annual Deprec.
		Street Name or Description	Dist. m	Street Name or Description	Dist. m									
127	Adams St	Adelaide St	0	Geale St	80	25,155	80	15,722	9,433	314	47.58	32.42	10,195	314
781	Adams St	Geale St	80	Archer Cres	248	49,140	80	30,713	18,428	614	47.58	32.42	19,915	614
657	Adams St	Archers Cres	248	Parry St	277	8,483	80	8,483	0	106	47.58	32.42	3,438	106
656	Adams St	Parry St	277	Andrew St	397	35,100	80	35,100	0	439	47.58	32.42	14,225	439
655	Adams St	Andrew St	397	Victoria St	555	47,385	80	47,045	340	592	47.58	32.42	19,204	592
128	Adelaide St	Ferry Boulevarde	0	Marina way	100	45,000	80	39,375	5,625	563	24.58	55.42	31,174	563
129	Adelaide St	Marina Way	100	Burnett St	211	49,050	80	42,919	6,131	613	24.58	55.42	33,979	613
130	Adelaide St	Burnett St	211	Ewington St	304	34,200	80	21,375	12,825	428	24.58	55.42	23,692	428
780	Adelaide St	Ewington St	304	Andrew St	398	33,840	80	21,150	12,690	423	24.58	55.42	23,442	423
608	Adelaide St	Andrew St	398	Goulburn St	568	61,200	80	30,600	30,600	765	24.58	55.42	42,396	765

Fig. 31A Example of Age based asset valuations

Figure 31A is a snapshot from the "Valuation" sheet of the "Pave_2" file. When the program asks for valuation based on age, the last 4 columns are added to the existing report based on asset condition and the age based overall values are returned to the summary table within the "St-Data2" file. Note that in this instance there is clearly an error in the data for the 3rd and 4th rows where the condition was zero delivering full WDV and the age of the asset was 32.42 years.

5.4.3 Accumulated Depreciation

The Accumulated Depreciation is a measure of the capital asset consumption. Here it is taken as the difference between the replacement value and the written down value of the asset on an individual segment-by-segment basis.

5.4.4 Annual Depreciation

Annual depreciation is the average annual loss or consumption of asset value as a result of the passage of time. Within the program the annual depreciation is taken as straight-line depreciation over the expected asset life. This assumption may not be the best approximation on an individual asset basis but over the whole asset group it is considered to represent a reasonable approximation of the annual capital loss within the Asset Group.

5.4.5 Other Information Columns Generated within this report Sheet

The Total Area of the Sealed Road Pavement segment within Column AP is generated within this report and takes into account all of the dimension variables that are located within columns FO to FT (the sealed surface section) of the master sheet.

5.4.6 Grouping Sealed Road Pavements of the Same Type

The program has a facility within both this report sheet and the Sealed Road Pavement Condition Report Sheet to group all of the Sealed Road Pavement segments of the same type and provide separate total figures for each. For example all of the Concrete Pavements would be grouped together with total figures for the group provided.

5.5 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 of 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.

5.5.1 Sealed Road Pavement Hierarchy Weightings

On 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.

5.5.2 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 “Pavement” drop down menu.

5.6 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 survey. Pavement failures are identified in two forms. Immediate, that need to be attended to right now because of risk considerations and potential, 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.

5.7 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 represents the starting point for the modelling process within the Moloney Modelling system.

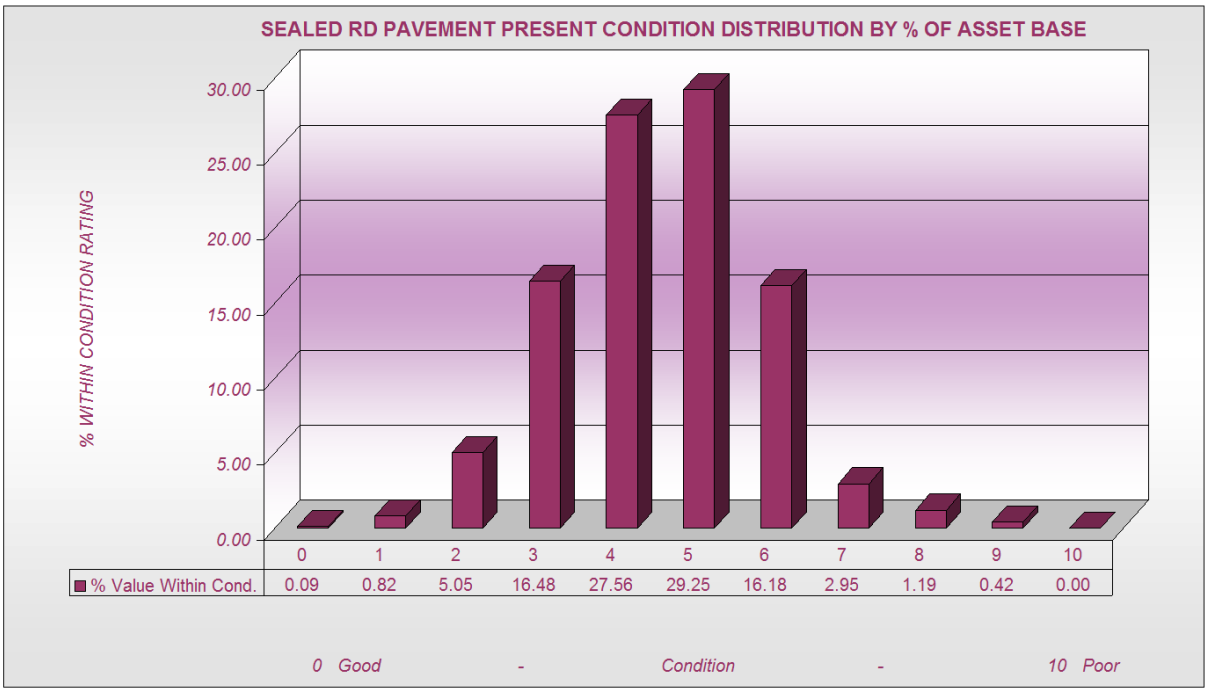


Fig. 32 Condition distribution Graph

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 32 above. If the shape of the graph looks questionable, then you should satisfy yourself that the reasons for your particular shape are correct.

5.8 Sealed Road Pavement - Program Amendments Sheet

This is a new sheet within the files that records the program amendments that have been made to the file.

5.9 Sealed Road Pavement File Drop Down Menu

Item No	Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5
	Pavement				
		1. Valuation Sheet			
1			*1. Run Valuation Sheet Update*		
			2. Sorting		
2				1. Road Name	
3				2. Pavement Type	
4				3. Town Name	
5			*3. Format Sheet for A4 Printing*		
6			*4. Group Pavements by type with separate totals*		
		2. Condition Sheet			
7			*1. Run Condition Sheet Update*		
			2. Sorting		
8				1. Pavement Type then Condition	
9				2. Pavement Weighted Condition	
10			*3. Generate Maintenance Grading Report*		
11			*4. Generate Table Drain Report*		
12			*5. Format Sheet for A4 Printing*		
13			*6. Format to view conservation details*		
14			*7. Group Pavements by type with separate totals*		
15			*8. Update Cumulative total in Column CG*		
16			*9. Modify Program condition to reflect Hierarchy Weightinge*		
		3. Isolated Failure Sheet			
17			*1. Run Isolated Failure Sheet Update*		
			2. Sorting		
18				1. Weighted Pavement Condition	
19				2. Road Name	
20				3. Extent of Failure	
21			*3. Format Sheet for A4 Printing*		
22			*4. Format to view conservation details*		
23			*5. Update Cumulative total in Column CL*		
		4. Clear the file			
24			*1. Clear all reports from this file*		
		5. Common Functions			
			1. Active Sheet		
				1. Autofilters on and Off	
25					On (Ctrl e)
26					Off (Ctrl r)
				2. Freeze Panes	
27					On (Ctrl Shift E)
28					Off (Ctrl Shift R)
				3. Protection	
29					No (Ctrl Shift P)
30					Off (Ctrl Shift U)
31				4. Select All Data for a Manual Sort (Ctrl x)	
32				5. View All Columns on Master Sheet (Ctrl Shift D)	

Fig. 33 Sealed Pavement File Drop Down Menu Layout

There are a number of programs that operate within the Sealed Road Pavement File. The only permanent sheets within the file are the Notes on File, the Program Amendments and the Condition Graph sheet.

Beyond this the file consists of a number of programs that will generate and modify the file reports. The programs are all accessed from the drop down menu titled **"Pavement**" at the top of the Sealed Road Pavement file (Excel 2003 and earlier) and on the Add Ins Ribbon (Excel 2007 and later) and detailed above in Figure 33 is table showing the program layout.

Detailed below in the table is an explanation of all 34 program functions that are attached to the Pavement File Drop Down Menu. The Item No at the left of the table refers to the corresponding Item No in Figure 33 above.

Item No	Explanation
1	Updates the Valuation sheet report by drawing the data from St-Data2
2	Sorts the Valuation Sheet by Road name in Column A followed by Chainage in Column D
3	Sorts the Valuation Sheet by Pavement code type in Column Y then alphabetically
4	Sorts the Valuation Sheet by Township Name in Column BN then alphabetically
5	Format the Valuation Sheet for A4 printing. Note that there are several page widths of additional information within the report that can be accessed but this operation displays the minimum valuation details
6	Group the data within the Valuation sheet by pavement code type with separate sub totals for each type.
7	Run the Condition Sheet update. This is done from data within the Valuation sheet.
8	Sorts the pavement condition sheet by pavement code type in column Y and then program condition in AB
9	Sorts the pavement condition sheet by pavement program condition in column AB and then the extent of isolated failures in AD
10	Delivers a report detailing the maintenance grading condition in Column AJ
11	Delivers a report detailing the table drain condition in Column N
12	Format the Condition Sheet for A4 printing. Note that there are several page widths of additional information within the report that can be accessed but this operation displays the minimum condition details only. For example the seal condition is present on the sheet and may well be used in selection targets for capital works on pavements.
13	This report sets up the Condition sheet to display the conservation values of the road reserve. This would be of great value for works crews when undertaking capital works activities to know where the high conservation road reserves are.
14	Group the data within the Condition sheet by pavement code type with separate sub totals for each type.
15	Updates the cumulative total figures in column CG. These can be lost if you delete a row while creating a works program this action will refresh them.
16	Modifies the Program condition within the Condition Sheet to reflect the weightings you have allocated to the road hierarchy. Effectively gives a higher priority to the more important classes of road.
17	Updates the Isolated failure sheet. This is done by taking data from the Valuation sheet.
18	Sort the Isolated Failure sheet by pavement program condition in Column AB followed by the extent of isolated pavement failure in Column AD
19	Sort the Isolated Failure sheet by Road Name in Column B followed by Chainage in Column D

20	Sort the Isolated Failure sheet by the extent of immediate pavement failures in Column AD followed by the extent of potential pavement failure in Column AE
21	Format the Isolated Failure Sheet for A4 printing. Note that there are several page widths of additional information within the report that can be accessed but this operation displays the minimum isolated failure details only.
22	This report sets up the Isolated Failure sheet to display the conservation values of the road reserve. This would be of great value for works crews when undertaking works activities to know where the high conservation road reserves are.
23	Updates the cumulative total figures in column CL. These can be lost if you delete a row while creating a works program this action will refresh them.
24	Clears all reports from the file to minimise file size. The Valuation, Condition and Isolated Failure Sheets will all be cleared by this action, but can be easily re established as they are all program generated from data within the St-Data2 file.
25	The first of several commonly used standard Excel functions that has been programmed in for easy access. This one sets up the Autofilters at row 22 on the active sheet (any sheet any file) Short Cut (Ctrl e)
26	Removes Filter Short Cut (Ctrl e) – or (Ctrl e)
27	Freezes the panes in any excel sheet to show the title rows 14 – 21 and the first 4 columns Short Cut (Ctrl Shift E)
28	Removes the Freeze Paves Short Cut (Ctrl Shift R)
29	Protects the Active sheet – Short Cut (Ctrl Shift P)
30	Removes Protection from the Active sheet – Short Cut (Ctrl Shift U)
31	Selects all data below row 22 on any sheet ready for a manual sort Short Cut (Ctrl x)
32	Displays all columns on the Active Sheet (un hides the hidden ones) Short Cut (Ctrl Shift D)

5.10 All Sub Asset File - General Matters

This section contains a number of general matters relating to all Sub Asset files

5.10.1 Running Sub Asset Program Reports

The 7 sub asset files can all be run from the one location within the “Run” Sheet of the St-Data2 file. See section 4.6.3 above for more details.

The Valuation sheets within the sub asset files contains all of the information necessary to generate the other reports within the files. Thus the Condition Sheets and the Isolated Failures Sheets can be generated for a second time via the Valuation sheet from within the sub asset files. This is done off the sub asset file menu. The exceptions to this rule are the Condition graph sheets and the Liability sheet within the Kerb file all of which can only be run from the “Run” sheet of the St-Data2 file.

5.10.2 Valuation and Condition Sheet Costing

The costing structure within these two sheets can be different. Within this explanation the pavement sub asset group will be used as an example but the same process applies to the sealed surface and kerb assets. The Valuation sheet is always based upon the unit rates associated with the code for type of pavement that is in place now. That is the unit rate associated with the pavement code in column EG of the Master Sheet of the St-Data2 file. The basic requirement of the Valuation Sheet is to provide accounting valuations relating to the existing assets.

The Condition sheet is used to set and cost future capital renewal and rehabilitation works. The planned works may be quire different in scope to the existing configuration. The costing within the Condition sheet is based upon the planned future treatments, thus the costs here can be quite different to the Valuation Sheet.

Within the Pavement section of the Master Sheet the proposed next treatment information is placed within Columns FK-FM. Different treatments, widths and lengths can be allocated here, the cost of which will all be reflected within the Condition sheet.

If no entry is made within the proposed next treatment section, it is assumed that the next treatment will be the same as the existing and hence that configuration will be used within the condition sheet. This facility is available for sealed and unsealed pavements and sealed surface asset groups. It is also available for kerbs in a slightly different format (see section 6.1.1 for more details).

5.10.3 Sub Asset Report Sheets and A4 Printing

All sub asset reports within the system are formatted for A4 printing. However, many of the reports have far more information than can be displayed within the A4 format. Some have as much as 3 to 4 A4 pages of details with much of the information having to be hidden to reduce down to the A4 printing limitation.

It was felt that it was better to bring in the details and hide them so that they could be used when needed for unique reports. The “Ctrl Shift D” command will display all hidden columns within all reports in the system. It is then possible to create your own unique reports by hiding the unwanted columns. All report sheets have the program facility to reformat back for A4 printing. See the Sub Asset file Menu.

6.0 Kerb File – Kerb_2

The Kerb file accesses data within the “St-Data2” File to produce accounting and Asset Management reports. The format of file is very similar to the sealed road pavement file that has been explained in detail within section 5 above. There is one matter that is unique to the kerb file and is detailed below.

6.1 Kerb File – Liability Sheet

The kerb sub asset file has a unique sheet that no other sub asset file has. It is called the Liability Sheet and it is designed to deliver much the same information as the Condition sheet in the other sub asset files, accept that the figures are all based upon a proposed retreatment rather than a repeat of an existing treatment.

Column BT and BU of the Master Sheet have a location for the placement of next proposed treatments for kerbs. The columns can be used to change the type of existing kerb, add a new kerb where there was none or remove an existing kerb. It is a bit limited in that if you place a Kerb Code in Column BT then the kerb will be allocated to the full length of the segment on both sides. There is however the add and subtract field in column BU which can be used to set the required length of kerb.

The way the report works is that if a proposed kerb code entry is made within Column BT of the Master Sheet than that overrides any kerb data within the main kerb section for the liabilities Sheet report and is reported as the future cost liability within the sheet. If no entry is made then the existing kerb details are carried through to the report or if there was no existing kerb then nothing is carried over to the liability report.

In this way the liability report can be used to predict the future financial demand on the kerb group. New kerbs can be added, unwanted kerbs removed and obsolete kerb types amend to deliver a realistic future liability cost for the asset group. If less than 2 entries are made within column BT of the Master Sheet then the Liability Sheet is not presented within the Kerb file.

The same facility exists within the two pavement and the sealed surface sub asset files but in a different form. Here the next treatment codes relate to one line item only (there are 4 possible kerb items per line) and the process is far simpler. In these files if there is a proposed next treatment recorded then that treatment takes the place of the existing treatment within the Condition sheet report. In this way the Valuation sheet reports on the existing situation while the Condition sheet reports on the proposed

7.0 Unsealed Pavement File –Uspave_2

The only real difference between the unsealed pavement file and the sealed pavement file used as the example within section 5 above is the way in which the program condition is generated. For the sealed

pavements the program condition becomes the worst of the 3 shape characteristics in columns EO – EQ plus an additional allowance for pavement failures (see section 4.3.65 above).

Unsealed pavement program condition is simply the overall condition in column EK with no other adjustments. Thus it is really up to the field assessor to get this right. But the condition could be created after the survey if depth of imported pavement material is recorded in Column ES along with the extent of pavement failures in EL.

8.0 Sealed Surface File – Seal_2

The Seal_2 file deals with the sealed surfaces that sit on top of the sealed road pavements and provide a waterproofing and wearing surface for the pavements. They are treated as a separate sub asset class because their performance and life cycle is very different to that of the sealed road pavements.

8.1 Sealed Surface File – Unique Matters within the File

This section will deal with the unique aspects of the Sealed Surface file that are not covered within the general approach as outlined within the sealed road pavement sub asset group above Section 5.

8.1.1 Isolated Failures and Condition Sheet Variations

There is no dedicated isolated failures sheet within the seal file. The reason for this is that there is no defined way in which a sealed surface fails that can be simply used to produce a meaningful isolated failures report. There are 8 individual distress factors that are picked up for each seal and they represent the means of creating the works programs that would be undertaken within the isolated failures report sheet for the other sub asset groups.

The condition sheet of the Seal file really takes the place of the isolated failures and the condition sheet within the other files. There are a series of reports and sort options on the Seal Surface Drop Down Menu that effectively deliver a variety of major maintenance and isolated failure reports. Detailed below are some of the program options along with an explanation of the reports

Seal Condition Sheet - Menu Item Name	**Description**
Sort by Program Condition	First draft costed reseal program
Crack sealing report	Sorts the data within the file so that the worst cracking condition segments are displayed at the top of the sheet
Seal Stripping Report	Sorts the data within the file so that the worst Stripping condition segments are displayed at the top of the sheet
Seal Oxidation Report	Sorts the data within the file so that the worst Oxidised condition segments are displayed at the top of the sheet
Seal Edge Break Report	Sorts the data within the file so that the worst Edge Break condition segments are displayed at the top of the sheet

8.1.2 Unique adjacent seal segments with the same condition

There is a function within the condition sheet that will unite segments with the same existing and proposed seal treatments and with program conditions within 0.5 of each other. The reason for this is to produce fewer and longer reseal projects and to avoid the situation where a segment is left out of the reseal program because it just fell outside of the condition parameters.

When the program is run any united segments will have the road name in column shaded purple to alert you to the fact that they have been united. The start and end references and the project length will reflect the total reseal project.

8.1.3 Seal Age Graphs Sheet

This sheet is unique to the Sealed Surface File. Most other sub asset sets are unlikely to have the age of construction and proposed year of retreatment present. The proposed year of retreatment is a standard field within the sealed surface area that should be picked up as part of the data capture process. Thus the graphs presented here should normally have data within the system to back them up.

There is a separate menu item within the Sealed Surface menu titled – Seal Age Graph Sheet. There is only one item on the menu and that produces a 20-year plot of the seal age and reseal program year.

9.0 Street Trees File – Trees_2

The Trees_2 file deals with the street trees that can be located within the road reserve and associated with the road assets. The file has been very little used partly because of its limitations. There is provision for recording only one code type for trees on each side of the road reserve. The facility may even be dropped from the program shortly to allow for other areas to be covered to a better extent.

9.1 Street Tree File – Unique Matters within the File

This section will deal with the unique aspects of the Street Tree file that are not covered within the general approach as outlined within the Sealed Road Pavement sub asset group above Section 5.

9.1.1 Isolated Failures and Works Sheet

There is no isolated failures sheet within the trees file but in its place is a Works Sheet. The works sheet was perhaps the reason for the development of the file. It is designed to cost the periodic works activities associated with street trees.

Within the Master Sheet around Columns BZ to CD there is capacity to codify the works activities with a corresponding code in Table C9 of the Codes Sheet. The codes carry a unit works cost as well as a recurrence period. This information is used within the Street Trees file to provide a consolidated list of works in priority order along with total cost and an annualised cost based upon the proposed recurrence interval.

10.0 Street Furniture File – Stfurn_2

The Stfurn_2 file deals with the street furniture items that can be located within the road reserve. The file has been very little used partly because of its limitations. There is provision for recording up to 5 different items of Street Furniture within a given street segment. Further items can be added but this would require the presence of a Nulled out dummy road segment.

10.1 Street Furniture File – Unique Matters within the File

This section will deal with the unique aspects of the Street Furniture file that are not covered within the general approach as outlined within the sealed road pavement sub asset group above Section 5.

10.1.1 Isolated Failures and Works Sheet

There is no isolated failures sheet within the street furniture file but in it's place is a risk items Sheet. The risk items sheet reports on problems that were identified during the inspection of the street furniture assets. Columns DL and DM on the Master Sheet allow you to identify the item of street furniture with the risk and also to allocate a risk factor on a 0 – 3 scale.

The costing within the Risk Items sheet is based upon the replacement of the assets rather than any repair work. This may not be ideal but at least the capacity exists to identify the problem assets and to prioritise them for action.

11.0 Footpath File – Footph_2

The footpath file is very closely allied to the pavement file used in section 5 above as the sub asset file sample.

11.1 Footpath File – Unique Matters within the File

One significant difference relates to the “Isolated Failures” Sheet. Here the actual total length of the failures is recorded against each piece of footpath (instead of calling up a percentage of the area). And instead of immediate and potential failures being recorded separately there is an urgency rating attached to the failures.

The system is not perfect, in that if there were 2 lineal metres of high urgency 3 failure as well as 10 m of low urgency 0 failure on the one footpath section then it would normally be called up as 12 m of failure with the higher single urgency rating of 3. While this is not technically correct it is felt that it is more important to identify all of the higher urgency locations and that while the repair crew are there they will in all likelihood repair all 12 m of the isolated failure within the segment.

The only other point of differentiation is that a single segment within the pavement file contains a single pavement asset. However, for footpaths and Kerbs there can be up to four separate individual assets per road segment. The four separate footpath sections are all taken to the Footpath file and reported upon separately. They are identified as to where they came from within the master in 2 ways. Firstly they are allocated a code descriptor within column T of the Valuation sheet and a subscript to the Segment ID number is added as detailed below.

Location Description within Segment	Location Code in Column T	ID added Subscript Column A
Left side Isolated Segment	L/IS	0.1
Left side Overall Segment	L/OA	0.2
Right side Isolated Segment	R/IS	0.3
Left side Overall Segment	R/OA	0.4

The overall segment description means that the footpath goes for the full segment length plus or minus any recorded (add of subtract distances). The isolated description indicates that the footpath does not go for the full segment length and its actual length is recorded and has no reference to the segment length.

12. Problem Solving - Running Reports:

When errors occur in the running of the sub asset file from the Run sheet, 9 times out of 10 it will be the result of data entry errors. The post data entry validation facility that is built into the St-Data2 file will locate nearly all of these. So if you do have problems then please run the validation check, fix the errors and run again.

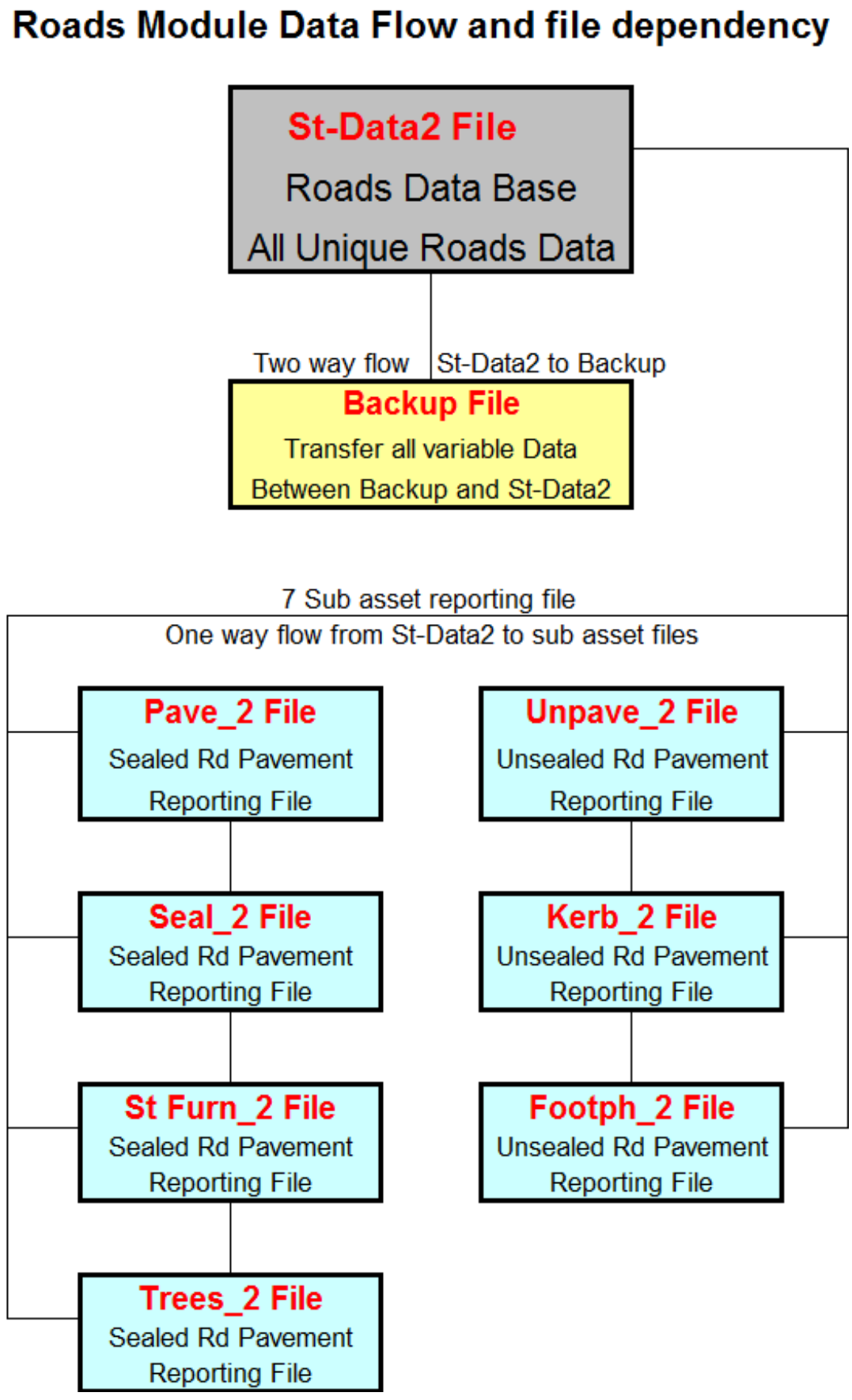
The “Invalid Entries” sheet does have a legend (Cell A7) detailing the errors that MUST be fixed, those that should be fixed and those that will make no difference to the running of the program at all. The MUST fix will generally cause stoppages or obvious valuation errors.

This action will cover most situations but unfortunately there remain some odd errors that are missed within the checking system. If you fix all important errors and still have problems then please check the names of all of the files to see that they are correct, otherwise zip up the St-Data2 file and email it to us and we will check it for you.

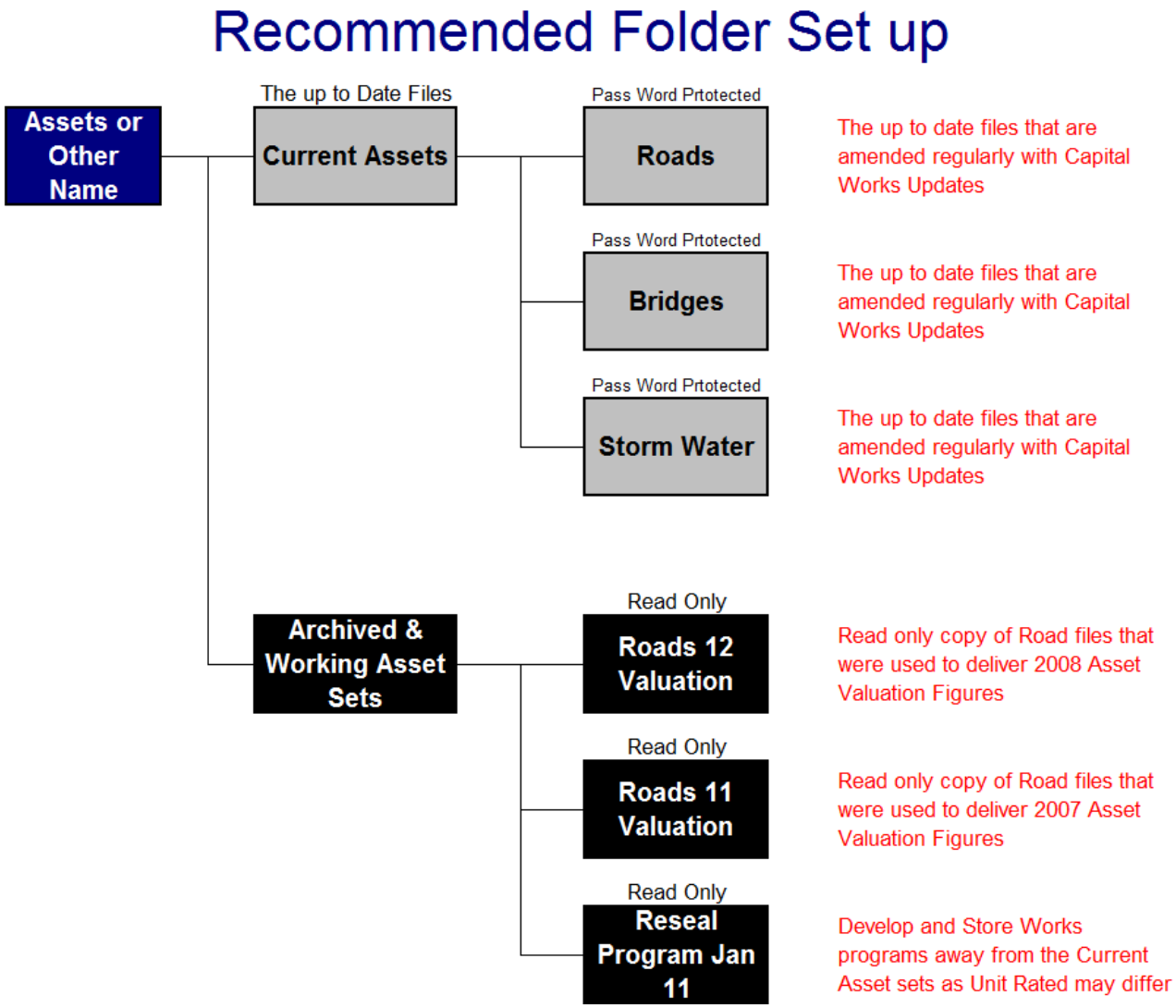
12.2. Accounting Treatments Associated with the Roads Module

This section has now been covered by a new file titled Road Asset Valuations August 2016 and is located on our web site

13.0 Schedule A – File Dependency Flow Chart



14.0 Schedule B – Recommended Directory Set Up



The importance of separating the Current and archived asset sets cannot be overstated for the following basic reasons:

- Updates to the system must be done in the one ongoing current set of files otherwise they could be lost in another copy of the database in another location.
- If you have predicated your asset valuations for end of financial year within the system, a read only copy MUST be held in an Archived area clearly labelled so that it can be retrieved at a later date with the exact figures used to justify the asset valuations.

For further information or any problems that you may have please do not hesitate to contact us as detailed below.

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