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WELCOME

The Structures Asset Valuation and Investment Tool, known as SAVI, supports asset owners, operators and managers with the management of their structure stock.

The Department for Transport through the UK Road Liaison Group commissioned the development of a structures decision support tool to assist local authorities and asset operators across the United Kingdom manage their structures stock.

The UK Bridges Board is the owner of SAVI.

SAVI is a multi-functional, condition-based decision support tool. It can be used to:

- carry out valuation of structures stock,
- develop prioritised short-term programmes of work, and
- develop long-term asset management plans

This user guide has been endorsed by the following organisations:



UK BRIDGES BOARD



ACKNOWLEDGEMENTS

SAVI has been developed as a next generation publicly available decision support tool.

SAVI builds on the methodology from the previous publicly available Structures Asset Management Planning Toolkit. It introduces new features and controls for asset management planning and has been redesigned to include the recommendations from industry consultations in relation to improving its overall usability.

SAVI has been developed by Arup, overseen by a Steering Group.

SAVI STEERING GROUP

Chris Allen-Smith (Chair)	Hertfordshire County Council
Keith Harwood	Hertfordshire County Council
Tom Lambert	Hertfordshire County Council
Satbir Gill	Hounslow Highways
Dr Vicky Vassou	Arup
Michael Smith	Arup

SAVI PROJECT TEAM

Keith Harwood	Hertfordshire County Council
Dr Vicky Vassou	Arup
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USING SAVI

In its simplest form, SAVI is a multi-functional, condition-based decision support tool which:

1

Requires the **input** of asset data (inventory, condition and works data) and user parameters (funding level, priorities).

2

Uses established **references** to perform a series of functions.



3

Runs three separate **analysis** functions:
i) valuation
ii) short-term asset management planning and
iii) long-term asset management planning;



4



Produces a series of **outputs** in the form of dashboards and detailed reports.

SAVI has been designed to assist local authorities in the United Kingdom to manage their structures stock, ensuring there is an accessible and consistent national approach. SAVI uses the inventory hierarchy and element level condition scoring system of the County Surveyors Society Inspection Process, as described in Appendix G of the Inspection Manual for Highway Structures (2007). SAVI evaluates Condition Performance Indicators based on the approach described in Guidance Document for Performance Measurement of Highway Structures, Part B1 (2007).

Using SAVI, users can develop long term asset management plans (up to 120 years), determine long-term intervention strategies, model variable budget scenarios against performance and whole life cost, develop tactical short term (5-year) programmes of work and carry out both gross and depreciated valuation of their structures stock.

USING THIS GUIDE

This User Guide offers a practical step-by-step guide to SAVI.

This document is a User Guide for the Structures Asset Valuation and Investment Tool. This User Guide steps through the process of using SAVI to yield meaningful results. Through the following sections of this User Guide, users will learn to:



At any time, a user can choose to return to the start of the User Guide by clicking on the SAVI logo. Users can navigate the User Guide utilising the navigation panel located on the left of each page.

This version of the User Guide has been designed for use on desktop as an interactive guide.



Throughout this User Guide, additional commentary and tips have been added which aim to provide helpful suggestions when using SAVI. These tips are denoted by the time saving icon.

Throughout this guide, definitions and further reading may be accessed by clicking the  icon.

ACCESSING SAVI

It is recommended that users always access and use the latest version of SAVI.

The latest version of SAVI can be accessed electronically, and is available for download with supporting documentation from the UKRLG website, at www.ukroadsliaisongroup.org/savi.

It is recommended that SAVI is downloaded and saved to the user's desired folder before it is opened and used. This will simplify the management of input and output files, particularly as export files generated using SAVI are automatically saved to the same folder location that SAVI itself is saved in.

Based on widespread consultation with Local Authorities, SAVI has been developed in Microsoft Excel. SAVI was developed using the Office 365 suite and as such runs most optimally in this environment, though it is compatible with versions of the programme dating back to Microsoft Excel 2010. Microsoft indicated that Office 2010 (including Microsoft Excel) will reach the end of its support lifecycle on 13 October 2020 and Microsoft recommends that if you are using Office 2010, you should start to plan to move to Office 365 or upgrade to a supported version of Office (Office 2013, Office 2016, or Office 2019), as appropriate.

Macros must be enabled to allow SAVI to run.



For optimal performance, it is recommended that SAVI is the only Microsoft Excel file open during analysis. Having other applications open will limit resources available for SAVI to run, especially applications which belong to the Microsoft Office suite.

REFERENCES

The following references have informed the development of SAVI.

Inspection Manual for Highway Structures (Highways Agency, 2007)

Guidance Document for Performance Measurement of Highway Structures, Part B1 (Highways Agency, CSS Bridges Group, 2007)

Code of Practice on the Highways Network Asset (CIPFA, 2016)

Code of Practice on the Highways Network Asset Guidance Notes (CIPFA, 2016)

Structures Asset Management Planning Toolkit Part A: Methodology (UK Bridges Board, 2015)

Structures Asset Management Planning Toolkit Part B: Functional Specification (UK Bridges Board, 2014)

Structures Asset Management Planning Toolkit Part C: Supporting Information (UK Bridges Board, 2015)

Structures Asset Management Planning Toolkit User Guide to the Computerised Model (UK Bridges Board, 2015)

Creating Consistent Element Inventories for Highway Structures (LoBEG, 2011)

SAVI INTERFACE

Before using SAVI for the first time, users should be aware of the user interface

SAVI relies on three key interfaces to operate:

1. the **SAVI Main Page**, where key parameters are entered,
2. the **SAVI Ribbon** where the tool functionality is controlled, and,
3. the **SAVI Modes**, which distinguish whether a user can input and edit data or run analysis and examine outputs.


Understanding the interface features will allow users to utilise SAVI to its full extent.

Throughout SAVI, colour coding has been applied to individual cells, column headings and tabs. The colour coding differentiates inputs, references, analysis and outputs, assisting the user to navigate and operate SAVI. For instance, cells, columns and tabs which require input are distinguished by salmon shading throughout SAVI, indicating the field or attribute may be reviewed and/or edited. Colour coding used throughout SAVI is as follows:





SAVI MAIN PAGE

The Main Page introduces SAVI, summarises inputs, and requires the user to enter key data and parameters.

Click on the individual tiles on the Main Page for more information.



Structures Asset Valuation and Investment (SAVI) Tool
Version 1.00

SAVI is currently in Analysis Mode. To input or make any changes to data or parameters, please switch to Edit Data Mode via the SAVI Ribbon.

What is the SAVI Tool?
The Structures Asset Valuation and Investment (SAVI) Tool is a decision support tool enabling asset owners, operators and managers to understand the current state and value of their structures stock and plan associated management activities.

The Tool has three functions:
i) Valuation of structures stock
ii) Short-term asset management planning (SAMP)
iii) Long-term asset management planning (LAMP)

Organisation Details


What is the name of your organisation? Hertfordshire County Council - Bridge Team

What is the type of Authority? Local Authority

Stock Summary

Number of structures in the model 1629

Number of elements in the model 20633



Data validation

Structure inventory	Valid
Element inventory	Valid
Element condition	Valid
Planned maintenance	Valid
Routine maintenance	Valid

Valuation
The valuation of structure stock for purposes of Whole of Government Accounts (WGA) returns.

Valuation Date (of the last run) 16/02/2020

Input Date (of valid inputs) 03/07/2019

To value the structure stock, click Valuation on the SAVI ribbon

Short-term Asset Management Planning
Develop a short-term asset management plan, including prioritisation and financial planning, for the structure stock.

The short-term asset management plan considers a 5 year budget

What is your annual budget? £13,000,000

Are there any specific priorities/strategies for asset management planning?

Priority Factors	Structures	Elements
Heritage factors	3.00	1.00
(Priority Adjustment Factor 2)	1.00	1.00
(Priority Adjustment Factor 3)	1.00	1.00
(Priority Adjustment Factor 4)	1.00	1.00
(Priority Adjustment Factor 5)	1.00	1.00
(Priority Adjustment Factor 6)	1.00	1.00

To develop a short-term asset management plan, click Short-term AMP on the SAVI ribbon

Long-term Asset Management Planning
Develop a long-term asset management plan, including prioritisation and financial planning, for the structure stock.

How many years to analyse? (max.120yrs) 5

What is the annual budget?	From Yr	To Yr	Annual Budget
1	2	£	13,000,000
3	5	£	15,000,000

When to intervene: Early intervention (condition 2C-3C)

Consider extra priority for:

V. poor condition, EC55	High importance EImt	Yes
Med or Low Imp EImt	No	
Poor condition, EC54	High importance EImt	Yes
Med or Low Imp EImt	No	

To develop a long-term asset management plan, click Long-term AMP on the SAVI ribbon

Annual Inflation Indexation

Please select price base year 2016/19

ROCOS index

Multiplier - Maintenance	1.213	Manually defined:	1.3
Multiplier - New builds	1.201	Manually defined:	1.3

Deterioration
To analyse scenarios where deterioration rates are accelerated / decelerated, the mean time to failure may be adjusted by applying factors, either:

- apply a global factor to all component/material types
- apply factors selectively in column "V" in Ref03604_i

[Go to: Ref03604_i](#)

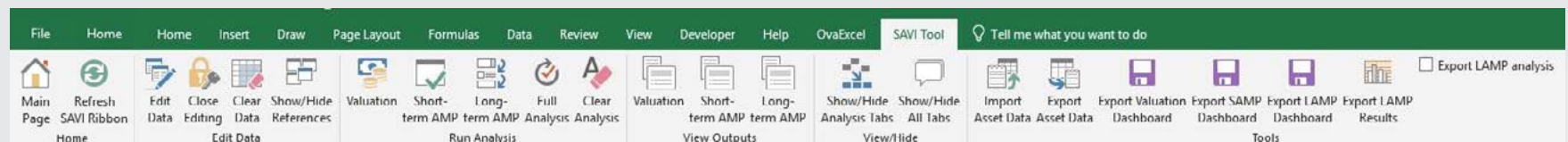
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SAVI RIBBON

When SAVI is opened the SAVI Ribbon is displayed as the default menu across the top of the Excel workbook.

The SAVI Ribbon has been designed as the primary control interface for operating SAVI. Through the SAVI Ribbon, users can edit and import asset data and parameters, run each of the analysis functions, navigate and view the various output, analysis and reference tabs and export the calculated dashboards and outputs.

Click on the individual buttons on the SAVI Ribbon below for more information.



SAVI MODES

SAVI operates in two modes, Edit Data Mode and Analysis Mode.

In Edit Data Mode, the user is required to ensure all inputs have been entered in the correct format so that the tool is ready to run. In Analysis Mode, the user can run the various functions and interrogate the resultant outputs.

Structuring SAVI in this way ensures that data errors during input are corrected before analysis is run, minimising the risk of corrupting the analysis.

Click on the Main Page below, as it appears for each mode for more information.

EDIT DATA MODE

ANALYSIS MODE

SAVI MODES – EDIT DATA MODE

When in Edit Data Mode, a user may manually input or import asset data, review and modify references and input or select parameters on the Main Page.

The intent of Edit Data Mode is to ensure all necessary inputs have been correctly entered and reviewed prior to running an analysis.

The Main Page format indicates when SAVI is in Edit Data Mode. The orange banner on the Main Page reads “SAVI is currently in Edit Data Mode. Input and changes to data or parameters are permitted. To run Analysis, please close Edit Data Mode via the SAVI Tool Ribbon.” All cells are shaded in blue on the Main Page, and edits are not permitted on the Main Page, on any of the four input tabs *Structures*, *Elements*, *Planned* and *Routine*, or in the Reference tabs.

To enter Edit Data Mode, a user must click the *Edit Data* button on the SAVI Ribbon.

When in Edit Data Mode, the four input tabs *Structures*, *Elements*, *Planned* and *Routine*, are displayed. A user is required to input asset data across the four tabs, as described in the Inputs section of this User Guide.

To view references, a user must click the *Show/Hide References* button on the SAVI Ribbon. A user may review and modify references, as described in the References section of this User Guide.

To exit Edit Data Mode, a user must click the *Close Editing* button on the SAVI Ribbon. SAVI will then prepare the data for analysis, running a series of checks to ensure the asset data entered is in the correct format to be able to run analysis.

If the data preparation is successful, SAVI will revert to Analysis Mode, ready to run the analysis functions.

If the data preparation is unsuccessful, SAVI will prompt the user to review the input data. Errors will be highlighted on the Data Validation tile on the Main Page, directing the user to the specific input tab where

the errors exist.

The user will be **unable to exit Edit Data Mode without first correcting data errors**, as SAVI is unable to run with data errors present. Identifying and correcting errors is described in the Inputs section of this User Guide.



Accessing Edit Data Mode invalidates any previously run analysis. **Each time a user enters Edit Data Mode, all previous calculations and results are cleared from SAVI**, regardless of whether any of the input data or parameters have been modified or not. A user will therefore have to run the analysis again.

SAVI MODES - ANALYSIS MODE

When in Analysis Mode, a user may run the analysis functions, examine the outputs and calculations and export results.

The intent of the Analysis Mode is to allow the user to run, examine and export the long-term asset management planning, short-term asset management planning and valuation outputs, with the confidence that the asset data and parameters have already been entered correctly in SAVI.

The Main Page format indicates when SAVI is in Analysis Mode. The blue banner on the Main Page reads “SAVI is currently in Analysis Mode. To input or make any changes to data or parameters, please switch to Edit Data Mode via the SAVI Tool Ribbon.” All cells are shaded in blue on the Main Page, and edits are not permitted on the Main Page or any of the four input tabs *Structures*, *Elements*, *Planned* and *Routine*.

A user can run four different analysis functions in SAVI, by clicking on one of the analysis buttons on the SAVI Ribbon.

To run valuation, a user must click the *Valuation* button on the SAVI Ribbon.

To run short-term asset management planning, a user must click the *Short-term AMP* button on the SAVI Ribbon.

To run long-term asset management planning, a user must click the *Long-term AMP* button on the SAVI Ribbon.

To run valuation, short-term asset management planning and long-term asset management planning, a user must click the *Full Analysis* button on the SAVI Ribbon. This will instruct SAVI to carry out in sequence all three functions.

For more information on the individual analysis functions, refer to the Analysis section of this User Guide.



For large datasets (with over 1,000 structures and 10,000 elements) the *Full Analysis* function may be useful to perform all calculations in one run, allowing the user to leave SAVI running uninterrupted, for hours, if necessary.

Once analysis has been run, the various outputs are automatically displayed.

When valuation has been successfully run, the *Valuation Dashboard* and *Valuation Certificate* will appear within SAVI.

When short-term asset management planning has been successfully run, the *Short-term Asset Management Planning (SAMP) Dashboard*, *Project List* and *Element List* will appear within SAVI.

When long-term asset management planning has been successfully run, the *Long-term Asset Management Planning (LAMP) Dashboard*, *LAMP Results* and *ECS Profile* will appear within SAVI.

When long-term asset management planning has been successfully run, the *Long-term Asset Management Planning (LAMP) Dashboard*, *LAMP Results* and *Element Condition Score Profile (ECS Profile)* will appear within SAVI.



Once an analysis function has been run, it cannot be re-run. For instance, if valuation has been run, pressing the *Valuation* button on the SAVI Ribbon will not re-run the function again, instead it will alert the user that Valuation has already been run.

Once the analysis has been successfully run, select outputs may be exported. Outputs may be exported as a separate Excel file using the SAVI Ribbon and the buttons *Export Value Dashboard*, *Export SAMP Dashboard*, *Export LAMP Dashboard* and *LAMP*.

For more information on the individual outputs, refer to the Outputs section of this User Guide.

1 INPUTS

To successfully run SAVI, the user is required to input asset data and parameters.

There are five groups of input data and parameters required in SAVI:

1. The input of key valuation and investment parameters. This is facilitated on the Main Page and is mandatory.
2. The input of structure level asset data (inventory). This is facilitated on the Structures tab and is mandatory.
3. The input of element level asset data (inventory and condition). This is facilitated on the Elements tab and is mandatory.
4. The input of defined and planned programmes of work. This is facilitated on the Planned tab and is optional.
5. The input of maintenance, inspection and assessment expenditure. This is facilitated on the Routine tab and is optional.

Asset data input into SAVI must reflect the current, baseline position of the structure stock.

Throughout SAVI, cells, columns and tabs which require the user to input data and parameters are indicated by salmon shading.

DATA PREPARATION

Users should first prepare the asset data to ensure all required attributes are available and in a format compatible with SAVI.

The recommended steps for data preparation are:

1. Review the attributes required by SAVI to ensure the required data is available. Note that most attributes are mandatory and must be entered for SAVI to operate.
2. For required data which is not available, capture or otherwise derive this data. For instance, if location data (whether a structure is located in a rural, urban or marine environment) is not available within the Structures Management System or Database, the user must derive this data in order to use SAVI.
3. Review the format of the attributes required by SAVI, to ensure the data available is in the correct format.
4. If required, cleanse the asset data to ensure it aligns with the format specified by SAVI. For instance, element names should match the naming classification used within SAVI.



It is likely that data entered for the first time in SAVI will contain errors that must be corrected. However, preparing data following the recommended steps above will ensure that errors are kept to a minimum, saving time and effort.

ENTERING DATA

Once data has been prepared, it can be entered into SAVI.

To enter data and parameters, SAVI must be in Edit Data Mode. To enter Edit Data Mode, refer to the SAVI Modes section of this User Guide.

Once in Edit Data Mode, a user has three means of entering data in SAVI:


APPROACH	RECOMMENDED FOR	GUIDANCE
Copy and paste values from separate Microsoft Excel file/s	First-time users of SAVI. Those who have prepared their data in a separate Excel file, looking to copy and paste this data directly into SAVI.	When using copy and paste functions, ONLY use the Copy and Paste Special – Values functionality. It is recommended that users replicate an identical SAVI column layout in their separate Excel files, to ensure attributes are pasted in the correct column in SAVI.
Importing asset data from a previous SAVI file, a SAVI export file, or a previous SAMPT file	Users who have run SAVI or SAMPT previously, who would like to import asset data into a new/clear version of SAVI.	Importing from a previous SAVI file, a SAVI export file, or a previous SAMPT file will NOT populate parameters which are required on the Main Page. It will only populate data on the Structures, Elements, Planned and Routine input tabs.
Manually inputting data, using the drop-down options where available	First-time users of SAVI with a small structure stock, or users making specific changes to asset data previously copied and pasted or imported into SAVI	Manually inputting data is a time-consuming exercise and not recommended in most instances.

MAIN PAGE





The Main Page requires the user to define key parameters

This includes budgets, specific priorities, intervention triggers, changes to default deterioration rates and indexation factors.

Click on the Main Page salmon input cells below for more information.



Structures Asset Valuation and Investment (SAVI) Tool
Version 1.00

SAVI is currently in Edit Data Mode. Input and changes to data or parameters are permitted. To run Analysis, please close Edit Data Mode via the SAVI Ribbon.

What is the SAVI Tool?
The Structures Asset Valuation and Investment (SAVI) Tool is a decision support tool, enabling asset owners, operators and managers to understand the current state and value of their structures stock and plan associated management activities.

The Tool has three functions:
i) Valuation of structures stock
ii) Short-term asset management planning (SAMP)
iii) Long-term asset management planning (LAMP)

Organisation Details


What is the name of your organisation? Hertfordshire County Council - Bridge Team

What is the type of Authority? Local Authority

Stock Summary

Number of structures in the model: 1629

Number of elements in the model: 20633



- Bridges
- Retaining Walls
- Culverts
- Sign/Signal Gantries
- High Mast Lighting
- Tunnels and Vehicular LUP
- Other

Data validation

Structure inventory	Valid
Element inventory	Valid
Element condition	Valid
Planned maintenance	Valid
Routine maintenance	Valid

Valuation
The valuation of structure stock for purposes of Whole of Government Accounts (WGA) returns.

Valuation Date (of the last run) 00/01/1900

Input Date (of valid inputs) 03/07/2019

To value the structure stock, click **Valuation** on the SAVI ribbon

Annual Inflation Indexation
Please select price base year 2018/19 ROCOS Index

Multiplier - Maintenance	1.213	Manually defined:	1.3
Multiplier - New builds	1.201	Manually defined:	1.3

Short-term Asset Management Planning
Develop a short-term asset management plan, including prioritisation and financial planning, for the structure stock.

The short-term asset management plan considers a 5 year budget.

What is your annual budget? £13,000,000

To develop a short-term asset management plan, click **Short-term AMP** on the SAVI ribbon

Are there any specific priorities/strategies for asset management planning?

Priority Factors	Structures	Elements
Heritage factors	3.00	1.00
(Priority Adjustment Factor 2)	1.00	1.00
(Priority Adjustment Factor 3)	1.00	1.00
(Priority Adjustment Factor 4)	1.00	1.00
(Priority Adjustment Factor 5)	1.00	1.00
(Priority Adjustment Factor 6)	1.00	1.00

When to intervene: Early Intervention (condition 2C-3C)

Consider extra priority for:

V poor condition, EC55	High Importance Elmt	Yes
Med or Low Imp Elmt	Yes	No
Poor condition, EC54	High Importance Elmt	Yes
Med or Low Imp Elmt	Yes	No

Long-term Asset Management Planning
Develop a long-term asset management plan, including prioritisation and financial planning, for the structure stock.

How many years to analyse? (max. 120yrs) 5

What is the annual budget?


From Yr	To Yr	Annual Budget
1	2	£ 13,000,000
3	5	£ 15,000,000

To develop a long-term asset management plan, click **Long-term AMP** on the SAVI ribbon

Deterioration
To analyse scenarios where deterioration rates are accelerated / decelerated, the mean time to failure may be adjusted by applying factors, either:

1. apply a global factor to all component/material types
2. apply factors selectively in column 'V' in Ref03504_i

[Go to: Ref03504_i](#)



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STRUCTURES

The Structures tab requires users to input structure level inventory data.

Structures can be entered in SAVI as either individual structures, or groups of structures. For detailed prioritisation and asset management planning it is recommended that assets are entered individually where possible. Most of the data is used for both valuation and prioritisation. Where this is not the case, a note is included in the attribute guidance.

Additional guidance is provided in SAVI, please refer to the comments annotated in the column headings.

For each structure or groups of structures one row of data is entered on the Structures tab. Users are required to input data for 17 attributes on the Structures tab, two attributes have multiple input columns. Click on each attribute for more information.

ELEMENTS

The Elements tab requires users to input element level inventory and condition data.

Each structure comprises several individual elements. Complex structures such as a bridge may consist of multiple elements while simple structures such as a mast may only comprise one element.



A user must define **at least one element for each structure** that has been defined on the Structures tab.

Additional guidance is provided in SAVI, please refer to the comments annotated in the column headings.

For each element, users are required to input 7 attributes on the Elements tab, one attribute has multiple inputs. Click on each attribute for more information.

PLANNED

The Planned tab requires users to input defined and planned programmes of work.

The planned works tab allows the user to enter pre-defined and planned works, which will be reflected in the short-term and long-term lifecycle planning outputs. Planned works must be entered at element level describing what maintenance action will be completed, which year it will take place, the cost and the resultant element condition.



Planned works is an optional input feature of SAVI. SAVI can operate without defining any planned works.

If entering planned works, users are required to input 5 attributes on the Planned tab. Click on each attribute for more information.

ROUTINE

The Routine tab requires users to input routine maintenance, inspection and assessment expenditure.

This tab allows the user to enter routine expenditure for routine/regular maintenance, inspection and assessment programmes. This allows the user to include additional costs which within SAVI are not necessary to be assigned against individual structures or elements.

For each year of the long-term asset management plan, the sum of the routine works is deducted from the defined annual budget.

For the short-term asset management plan, the sum of the routine works in the first five year is removed from the available five-year budget.



Routine works is an optional input feature in SAVI. SAVI can operate without routine works.

Users may input expenditure against 5 activities on the Routine tab for each year. Click on each activity for more information.

PREPARING SAVI FOR ANALYSIS

Once data has been entered in SAVI, it must be prepared for analysis

When satisfied that all input data has been entered correctly, SAVI prepares the data for analysis, triggered by the user exiting Edit Data Mode.

As mentioned in the SAVI Modes section of this User Guide, to exit Edit Data Mode a user must click the *Close Editing* button on the SAVI Ribbon. SAVI will then prepare the data for analysis, running a series of checks to ensure the asset data entered is in the correct format to be able to run the analysis.

If the data has been entered correctly, data preparation will run successfully, and SAVI will return to Analysis Mode, ready to run the analysis functions.

If there are errors, data preparation will be unsuccessful, and SAVI will prompt the user to review the input data. Errors will be highlighted on the Data Validation tile on the Main Page, directing the user to the specific input tab where the errors exist.

To the far right of each input tab (e.g. Structures and Elements tabs) are a series of check columns. The checks are carried out as part of the data preparation once the *Close Editing* button on the SAVI Ribbon is pressed. Users may use these check columns (and the filtering options which are activated) to quickly identify errors within their input data.

Once data has been corrected, the user is required to click the *Close Editing* button again on the SAVI Ribbon which will then prepare the data for analysis and re-run the checks to ensure the asset data entered is in the correct format. A user is required to repeat this process of identifying and correcting data errors, until all errors are eliminated, and SAVI returns to Analysis Mode ready to run analysis



Remember that the user will be **unable to exit Edit Data Mode without first correcting data errors**, as SAVI is unable to run with data errors present.

2

REFERENCES

References provide the baseline data and assumptions upon which SAVI operates.

The references in SAVI hold the essential background information, which in combination with the data and parameters input by the user, allow the valuation, short-term asset management and long-term asset management functions to run.

When SAVI is in Edit Data Mode, References may be viewed by clicking the *Show/Hide References* button on the SAVI Ribbon. References are numbered in such a way to largely follow the calculation sequence within SAVI, and to avoid confusion have remained as in the original SAMPT.

SAVI References are divided into two groups, reflecting recommended review and where necessary amendments by users. These are:

- Updates optional – the user may review but should think carefully before updating. Only advanced users with an understanding of the methodology and how it is directly applied in SAVI should make updates. For instance, updating the deterioration profiles for particular components or materials.
- Updates not advisable – for instance, changing the element names which are currently aligned with the nomenclature / classification in the County Surveyors' Society Inspection Process, contained in Appendix G of the Inspection Manual for Highway Structures (2007).



In general, references should not be updated unless the user clearly understands the ensuing implications and is aware of the relationships between the reference tables. Updating references may introduce bugs into SAVI preventing it from running as expected.

REFERENCE DEFINITIONS

SAVI References are divided into two groups, reflecting whether user update is considered appropriate.

Click on each reference for more information.

Updates Optional

Updates Not Advisable

3

ANALYSIS

Once asset data and parameters have been successfully input, SAVI is ready to carry out analysis

There are three different analysis functions – valuation, short-term asset management planning and long-term asset management planning – that can be run in SAVI and a fourth option – full analysis – that can run all the other three analyses sequentially:

- 1. Valuation:** determines the monetary value of the structures stock. This includes the gross replacement cost of the structures stock (how much it would cost to replace all existing structures with new structures) and the depreciated replacement cost (the remaining value of the structures stock considering current condition, given all but newly built/maintained structures have deteriorated to some degree).
- 2. Short-term asset management planning:** develops a 5-year programme of works, determining which structures and elements should be maintained or replaced in this period. This gives the user a programme of work at both scheme and element level summarising expenditure and resultant stock condition.
- 3. Long-term asset management planning:** models the structure stock for up to 120 years, allowing the user to assess how defined budget, intervention and priority scenarios affect the predicted condition and risk profile of the structures stock. By adjusting these parameters, users can develop their own customised, optimised asset management plans to ultimately secure appropriate levels of funding.
- 4. Full analysis:** runs the sequence of analyses explained above with valuation, short-term asset management planning and long-term asset management planning run in succession. This allows the user to complete an uninterrupted analysis producing all outputs in a single run.

VALUATION

The valuation function determines the current monetary value of the structures stock

This ensures that the substantial value which is tied up in physical structural assets is understood, emphasising the importance of good asset management to maintain value.

SAVI values the structures stock in terms of gross replacement cost and depreciated replacement cost. According to CIPFA Code of Practice for the Highways Network Asset (2016), “gross replacement cost is the total cost of replacing either the whole of an existing highway network or some part of it with a modern equivalent asset. It is the starting point for calculating the net current value of the Highways Network Asset and its components – that is, their value after taking account of physical deterioration and all forms of obsolescence and optimisation.”

Depreciated replacement cost represents the remaining value of a modern equivalent asset, taking into consideration the current condition (age) of the asset which has already been consumed.



Indexation rates – are required to be specified on the Main Page as they directly impact the Price base used for the valuation and all cost related calculations.

VALUATION APPROACH

SAVI adopts the CIPFA/HAMFIG approach to valuation

The valuation approach in SAVI has been accepted by CIPFA through HAMFIG and aligns with CIPFA guidance; any alterations to the valuation calculation or reference tables invalidate the Valuation for WGA purposes.

The Gross Replacement cost is calculated on the basis of a value per square metre dependent on the structure type. The values per square metre are in Ref 12.

Cost of repair is used as a measure of depreciation. The deterioration curves (Ref 03&04ii) are used to determine the effective age of each element from its condition, and thus the proportion of element life that has been consumed. The cost of repair at the 'end of life' of the element (condition 5B) is calculated and proportioned to calculate the depreciation in current condition. Finally, the total of the depreciation values for the individual elements is deducted from the GRC to calculate the GRC.

In more detail, the calculation process is outlined below:

VALUATION IN SAVI

Within SAVI, Valuation is run through the SAVI Ribbon

Click on each step below to step through the user interface when running valuation using SAVI.



SHORT-TERM ASSET MANAGEMENT PLANNING (SAMP)

Short-term asset management planning develops a tactical 5-year asset management plan

The short-term asset management plan identifies and prioritises structures and elements that should be maintained or replaced in the next 5-years. This tactical asset management planning feature allows users to understand and address their immediate demands – what needs to be done in the immediate funding period.

Having identified and prioritised the structures and elements that should be maintained or replaced in the next 5-years, SAVI develops a programme of works. SAVI also develops a list of the individual elements and components that will be maintained or replaced as part of this programme of works.

SAMP APPROACH

The short-term asset management planning approach has been developed for SAVI.

SAVI calculates the cost to repair each element, across the whole stock, where condition is at or below the intervention threshold set by the user. The total cost of the work is considered as the current workbank and is reported in the Long-term Asset Management Plan.

A priority score is calculated for each element and the cost of repairing the elements in priority order is compared to the five-year budget. The repairs falling within the budget form the proposed scheme for each structure. Finally, the schemes are prioritised based on the sum of the individual element priority scores.

This is explained in more detail as follows:

SAMP IN SAVI

Within SAVI, short-term asset management planning is run through the SAVI Ribbon

Click on each step below to step through the user interface when running valuation using SAVI.



LONG-TERM ASSET MANAGEMENT PLANNING (LAMP)

Long-term asset management planning develops a strategic asset management plan up to 120 years

The Long-term Asset Management Plan carries out a similar process to SAMP for each year of the lifecycle of the structure, evaluating the condition and risk profile of the stock after each year.

The LAMP function allows the user to model the structures stock for a duration up to 120 years. A user must first define their key input parameters including annual budgets (for each year of the analysis), intervention thresholds and additional priorities. For each year, SAVI then identifies and prioritises the required maintenance and determines the resultant expenditure, stock condition and risk profile.

By adjusting the key input parameters users are able to develop a number of scenarios which represent i) variable funding options (business as usual, austerity, etc.), ii) different intervention strategies (early or late intervention) and iii) bespoke priorities of the organisation (additional priority for special structures, etc.).

Users can assess the results to develop an optimised strategic asset management plan to ultimately secure appropriate levels of funding.

LAMP APPROACH

The LAMP analysis runs iteratively, for the defined number of years

The long-term asset management planning function follows a similar sequence to the short-term asset management planning process, running iteratively for a defined number of years (up to 120 years).

This is explained as follows:

LAMP IN SAVI

Within SAVI, long-term asset management planning is run through the SAVI Ribbon

Click on each step below to walk through the user interface when running long-term asset management planning using SAVI.



FULL ANALYSIS

To run all analysis functions in sequence, users can utilise the Full Analysis function

Full Analysis runs valuation, short-term asset management planning and long-term asset management planning in succession. This allows the user to complete an uninterrupted analysis producing all outputs in a single run. Note that, for a very large structure stock (i.e. 50,000 elements) this feature can cause an Excel memory error. If this occurs

then the analyses should be run individually, one type of analysis per Excel file.

Click on each step below to walk through the user interface when running Full Analysis using SAVI.



ANALYSIS FEATURES

When running the analysis, there are a few features to be mindful of

When an analysis function has been run in SAVI, the same function cannot be re-run. For instance, once Valuation has been run, the user will not be able to re-run analysis, as the calculations have already been run and the output would be available. Results will not change until the user alters data inputs, which would require switching to *Edit Data Mode*.

To clear the analysis at any point, the user can press the *Clear Analysis* button on the SAVI Ribbon. This will clear all analysis functions that have been run previously. Note that this cannot be undone, and the analysis will have to be re-run.

To view the detailed calculations within SAVI, the user can press the *Show/Hide Analysis Tabs* button on the SAVI Ribbon. This will display / hide the analysis tabs, corresponding to the analysis functions which have been run.

The analysis run time will depend on the individual configuration of the computer running the analysis, however estimated runtimes are as follows:

	VALUATION	SAMP	LAMP (20-YEAR ANALYSIS)	FULL ANALYSIS
Small dataset 60 Structures + 700 Elements	1-2 seconds	1-2 seconds	3-5 seconds	4-8 seconds
Medium dataset 1,500 Structures + 20,000 Elements	1-2 minutes	1-2 minutes	12-25 minutes	15-30 minutes
Large dataset 5,000 Structures + 70,000 Elements	7-15 minutes	30-60 minutes	4-8 hours	Not recommended
For large data sets the user is recommended to run one analysis per file, to avoid issues with Excel memory usage				

4

OUTPUTS

Once the analysis has been run, the results are displayed as a series of outputs

Each analysis function generates a number of predefined outputs, which are automatically displayed once the analysis function has been run.

For valuation

the *Valuation Dashboard* summarises the monetary value of the structures stock (GRC and DRC), and the stock condition.

the *Valuation Certificate* provides a reportable document, summarising total stock GRC, DRC and depreciation.

For short-term AMP

the *SAMP Dashboard* summarises the total expenditure in the next 5 years broken down by structure and element type, and the resultant stock condition.

the *Project List* defines a programme of works (at scheme level) for the next 5 years.

the *Element List* summarises in order of priority the element works in the next 5 years.

For long-term AMP

the *LAMP Dashboard* summarises the spend, risk, condition and key performance indicator (KPI) profile for the structures stock, over the defined number of years

the *LAMP Results* provide a detailed breakdown of spend, risk and condition attributes for each year of the defined number of years

the *ECS Profile* documents the condition score of each element, for each year of the defined number of years.

VALUATION

Once Valuation has been run, the Valuation Dashboard and Valuation Certificate will automatically appear in SAVI

The *Valuation Dashboard* and *Valuation Certificate* will be located adjacent to the input tabs, at the bottom of the Excel screen.



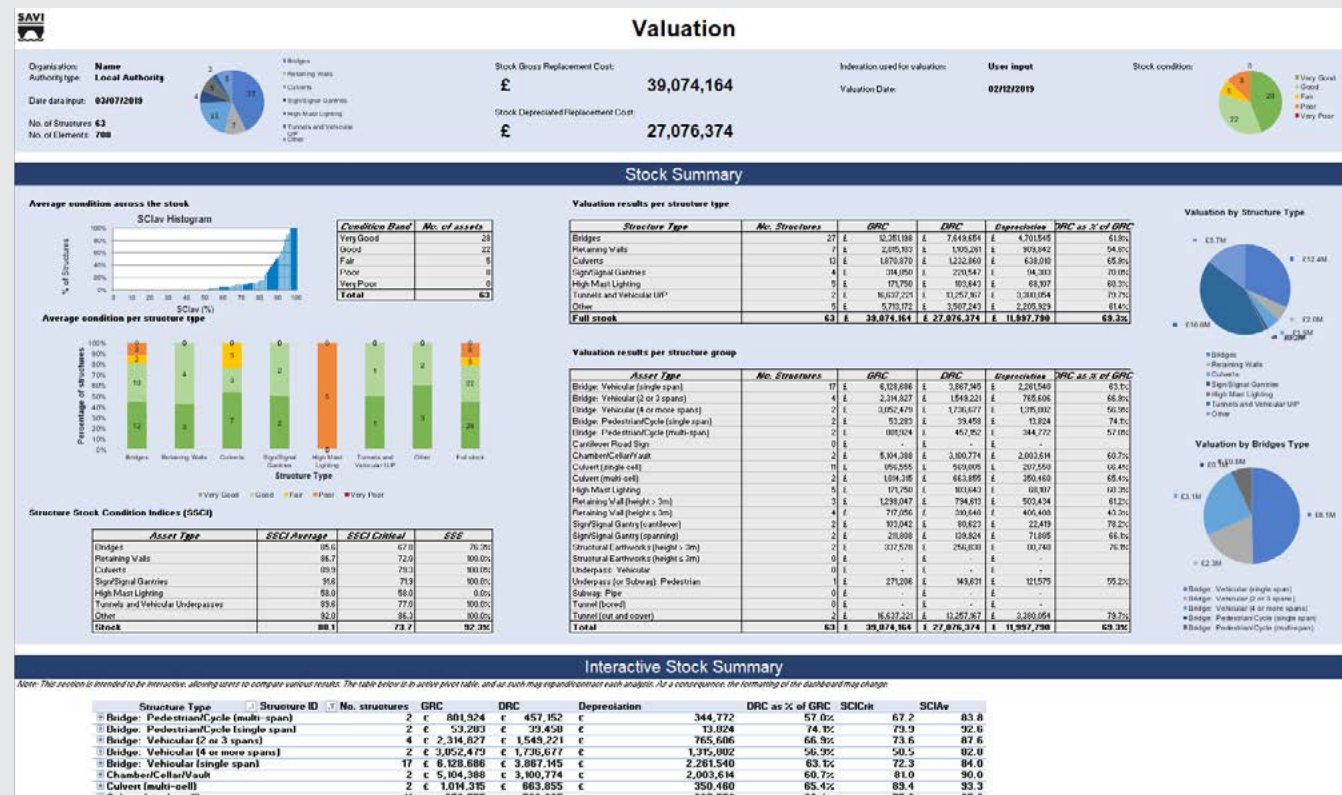
Within the 'View Outputs' group on the SAVI Ribbon, the *Valuation* button will now be active, as there are now results to display. The user can click on this *Valuation* button to move directly to the *Valuation Dashboard*.

VALUATION DASHBOARD

The Valuation Dashboard summarises the monetary value and condition of the structures stock

The *Valuation Dashboard* can be used to study the composition of the stock, in terms of value and condition, and to compare current Valuation with historic figures.

Click on the tiles of the *Valuation Dashboard* for more information.



VALUATION CERTIFICATE

The *Valuation Certificate* provides a reportable document, summarising stock GRC, DRC and depreciation

A user may use the *Valuation Certificate* for official reporting of structures stock value as part of Whole of Government Accounts.


Click on the sections of the *Valuation Certificate* for more information.

Structures Asset Valuation and Investment (SAVI) Tool
Certificate of Valuation for
Structures Team

User Name: michael.smithDate/time: 24/01/2020 12:06

Version: 1.00Inflation Indexation to Year: 2018/19

Workbook Name: SAVI v1.0



Gross Replacement Cost: £36,095,335

Depreciated Replacement Cost: £24,948,604


DRC as % of GRC: 69.12%


Accumulated Depreciation: £11,146,731


Annual Depreciation: £379,747


No. of Structures63


No. of Elements708

Department for Transport

UK BRIDGES BOARD

CIPFAThe Chartered Institute of Public Finance & Accountancy

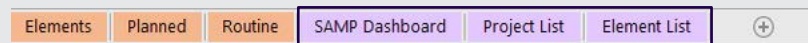
ADEPTASSOCIATION OF DEPARTMENTS OF ENVIRONMENT, ENERGY, PLANNING AND TRANSPORT

ARUP

SHORT-TERM ASSET MANAGEMENT PLANNING

Once Short-term AMP has been run, the SAMP Dashboard, Project List and Element List will automatically appear in SAVI

The *SAMP Dashboard*, *Project List* and *Element List* will be located adjacent to the input tabs (or the *Valuation Certificate*, if valuation has already been run) at the bottom of the Excel screen.

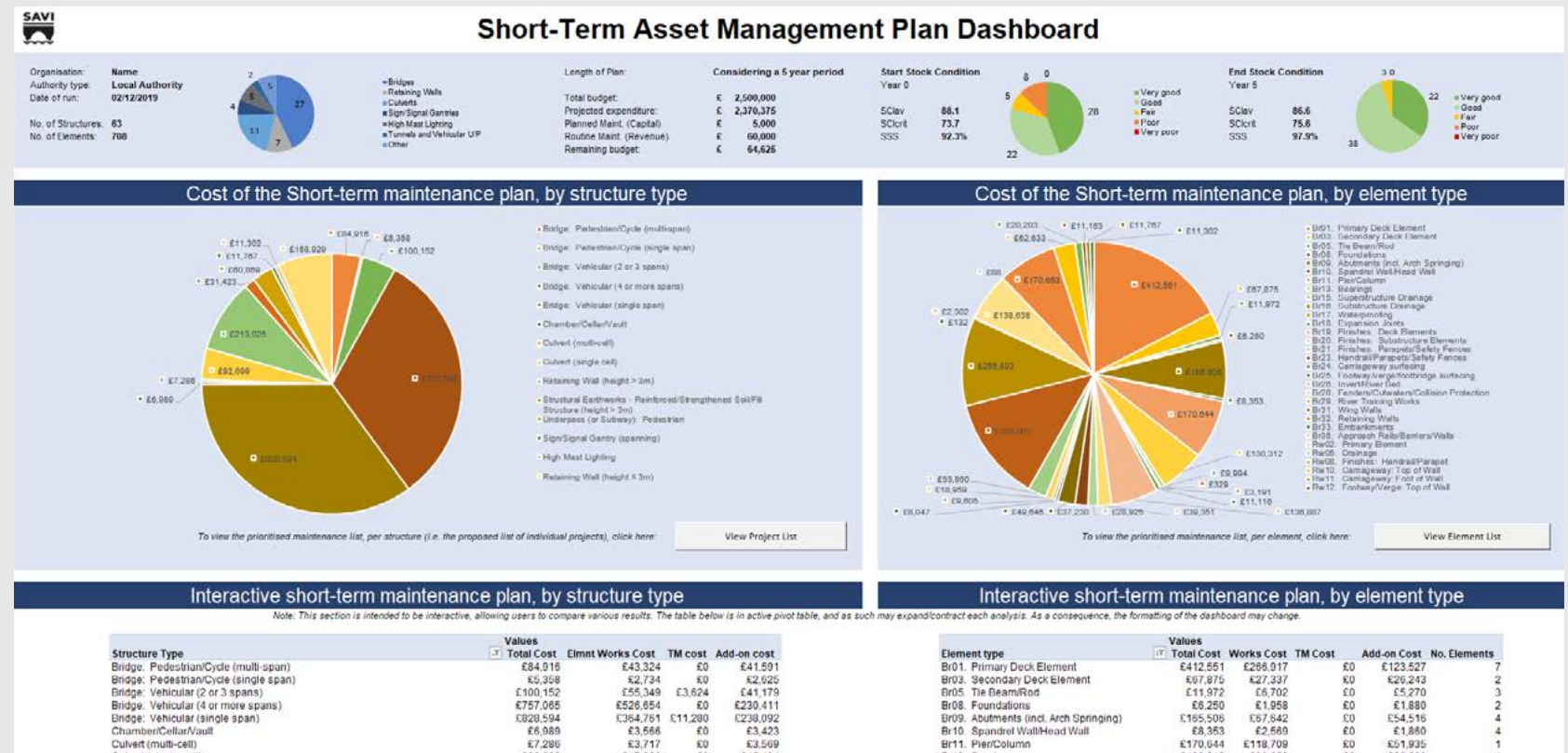


Within the 'View Outputs' group on the SAVI Ribbon, the Short-term AMP button will now be active, as there are now results to display. The user can click on this Short-term AMP button to move directly to the SAMP Dashboard.

SAMP DASHBOARD

The SAMP Dashboard summarises total expenditure in the next 5 years and the resultant stock condition

Click on the tiles of the SAMP Dashboard for more information.



PROJECT LIST

The *Project List* defines a programme of works for the next 5 years

This *Project List* constitutes a short-term asset management plan, with schemes planned sequentially in order of priority over the 5-year period. An asset manager may use the *Project List* as evidence to support their proposed short-term asset management plan.

Click on the sections of the *Project List* for more information.

Year Structure repaired	Structure Priority Score (condition triggered)	Identifier of Structure	Structure Name	Structure Type	Element type	Material / Component Type	Maintenance activity	Element Works Cost	TM Cost	Add-on Cost	Total Cost
1	15041.01	ST38	BRIDGE 23	Bridge: Vehicular (single span)	Br01. Primary Deck Element	Brickwork	Structure replaced				£13,472
					Br03. Secondary Deck Element	Other/Unknown Material	Structure replaced				£14,206
					Br05. Tie Beam/Rod	Cast Iron or Wrought Iron	Structure replaced				
					Br09. Abutments (incl. Arch Springing)	Brickwork	Structure replaced				£37,862
					Br10. Spandrel Wall/Head Wall	Brickwork	Structure replaced				
					Br17. Waterproofing	Other/Unknown Waterproofing	Structure replaced				
					Br23. Handrail/Parapets/Safety Fences	Other/Unknown Handrail/Parapet/Safety	Structure replaced				
					Br24. Carriageway surfacing	Carriageway surfacing	Structure replaced				£408
					Br26. Invert/River Bed	Other/Unknown Invert Material	Structure replaced				
					Br31. Wing Walls	Other/Unknown Material	Structure replaced				
					Br32. Retaining Walls	Other/Unknown Material	Structure replaced				£79,033
					Br01. Primary Deck Element	Brickwork	Structure replaced				£8,635
					Br08. Foundations	Foundation Material	Structure replaced				£2,411
					Br18. Abutments (incl. Arch Springing)	Brickwork	Structure replaced				£5,406
					Br19. Spandrel Wall/Head Wall	Brickwork	Structure replaced				£3,924
2	6246.12	ST37	BRIDGE 22	Bridge: Vehicular (single span)	Br17. Waterproofing	Other/Unknown Waterproofing	Structure replaced				£3,191
					Br21. Finishes: Parapets/Safety Fences	Other/Unknown Finish	Structure replaced				
					Br23. Handrail/Parapets/Safety Fences	Other/Unknown Handrail/Parapet/Safety	Structure replaced				
					Br24. Carriageway surfacing	Carriageway surfacing	Structure replaced				
					Br26. Invert/River Bed	Other/Unknown Invert Material	Structure replaced				
					Br29. River Training Works	Other/Unknown Material	Structure replaced				
					Br31. Wing Walls	Other/Unknown Material	Structure replaced				
					Br33. Embankments	Other/Unknown Embankment Material	Structure replaced				£45,745
					Br01. Primary Deck Element	Brickwork	Masonry repairs	£244,792	£0	£107,597	£351,889
					Br11. Pier/Column	Other/Unknown Material	Maintenance/Repair of Other/Unknown Materials	£118,709	£0	£51,835	£170,644
					Br13. Bearings	Other/Unknown Bearing	Bearings: Replacement	£90,852	£0	£39,860	£130,312
					Br18. Finishes: Deck Elements	Other/Unknown Finish	Finishes: Wet/Dry surface preparation and re-application of finish	£72,501	£0	£31,719	£104,220
					Br01. Primary Deck Element	Brickwork	Masonry repairs	£6,078	£0	£3,402	£9,478
					Br05. Tie Beam/Rod	Cast Iron or Wrought Iron	Metalwork repair	£2,911	£0	£1,630	£4,541
					Br23. Handrail/Parapets/Safety Fences	Other/Unknown Handrail/Parapet/Safety	Parapet: Maintenance (Other)	£2,619	£563	£1,579	£4,761
3	436.1	ST20	BRIDGE 11	Bridge: Vehicular (single span)	Br24. Carriageway surfacing	Carriageway surfacing	Carriageway surfacing: replacement	£5,590	£034	£3,202	£9,733
					Br31. Wing Walls	Other/Unknown Material	Maintenance/Repair of Other/Unknown Materials	£42,791	£0	£23,963	£66,754
					Br21. Finishes: Parapets/Safety Fences	Other/Unknown Finish	Finishes: Wet/Dry surface preparation and re-application of finish	£5,281	£1,352	£3,962	£10,496
					Br23. Handrail/Parapets/Safety Fences	Other/Unknown Handrail/Parapet/Safety	Parapet: Replacement	£12,520	£3,043	£9,122	£24,685
					Br20. Finishes: Substructure Elements	Other/Unknown Finish	Finishes: Wet/Dry surface preparation and re-application of finish	£23,423	£0	£15,926	£39,351
					Br24. Carriageway surfacing	Carriageway surfacing	Carriageway surfacing: replacement	£13,144	£1,958	£7,752	£22,855
					Br31. Wing Walls	Other/Unknown Material	Maintenance/Repair of Other/Unknown Materials	£42,791	£0	£23,963	£66,754
					Br08. Foundations	Foundation Material	Foundations: repair	£1,958	£0	£1,880	£3,838
					Br10. Spandrel Wall/Head Wall	Brickwork	Masonry repairs	£403	£0	£387	£790
					Br24. Carriageway surfacing	Carriageway surfacing	Carriageway surfacing: maintenance	£343	£0	£329	£672
					Br26. Invert/River Bed	Other/Unknown Invert Material	Invert repair	£199	£0	£191	£391
					Br19. Finishes: Deck Elements	Other/Unknown Finish	Finishes: Wet/Dry surface preparation and re-application of finish	£9,543	£0	£5,344	£14,886
					Br26. Footway/verge/footbridge surfacing	Footway surfacing	Footway surfacing: maintenance	£283	£42	£187	£492
					Br32. Retaining Walls	Other/Unknown Material	Maintenance/Repair of Other/Unknown Materials	£103,014	£0	£57,600	£160,702
					Br01. Primary Deck Element	Brickwork	Masonry repairs	£8,498	£0	£5,770	£14,270
4	23.6	ST08	BRIDGE 04	Bridge: Vehicular (single span)	Br09. Abutments (incl. Arch Springing)	Brickwork	Masonry repairs	£37,216	£0	£25,207	£62,522
					Br10. Spandrel Wall/Head Wall	Brickwork	Masonry repairs	£2,166	£0	£1,472	£3,639
					Br21. Finishes: Parapets/Safety Fences	Other/Unknown Finish	Finishes: Wet/Dry surface preparation and re-application of finish	£4,605	£1,670	£5,165	£11,520
					Br25. Footway/verge/footbridge surfacing	Footway surfacing	Footway surfacing: maintenance	£432	£63	£440	£935
					Br26. Invert/River Bed	Other/Unknown Invert Material	Invert repair	£877	£0	£842	£1,719
					Br15. Superstructure Drainage	Other/Unknown Drainage System	Drainage: Replacement	£187	£0	£180	£367

ELEMENT LIST

The *Element List* summarises in order of priority the element works in the next five years

The *Element List* is intended to give asset managers visibility across the types of elements needing work. This highlights any common trends which could trigger a specific programme of works for a specific element type. For example, multiple bearings requiring replacement could initiate a specific programme of bearing replacement to drive economies of scale. An asset manager may use the *Element List* as evidence to support their proposed asset management plan and to develop specific programmes of work based on common defects across the stock.

Click on the sections of the *Element List* for more information.

Element Priority Score (condition triggered)	Identifier of Structure	Structure Name	Structure Type	Element type	Start ECS	Material / Component Type	Maintenance activity	Element Works Cost	TM Cost	Add-on Cost	Total Cost
5086.45	ST37	BRIDGE 22	Bridge: Vehicular (single span)	Br01: Primary Deck Element	5.00	Brickwork	Structure replaced				£8,836
	ST38	BRIDGE 23	Bridge: Vehicular (single span)	Br01: Primary Deck Element	5.00	Brickwork	Structure replaced				£13,472
				Br03: Secondary Deck Element	5.00	Other/Unknown Material	Structure replaced				£14,296
				Br09: Abutments (incl. Arch Springing)	5.00	Brickwork	Structure replaced				£37,862
419.79	ST36	BRIDGE 21	Bridge: Vehicular (4 or more spans)	Br01: Primary Deck Element	4.64	Brickwork	Masonry repairs	£244,792	£0	£107,097	£351,889
419.21	ST36	BRIDGE 21	Bridge: Vehicular (4 or more spans)	Br11: Pier/Column	4.06	Other/Unknown Material	Maintenance/Repair of Other/Unknown Materials	£118,709	£0	£51,905	£170,614
408.62	ST20	BRIDGE 11	Bridge: Vehicular (single span)	Br24: Carriageway surfacing	4.81	Carriageway surfacing	Carriageway surfacing: replacement	£5,598	£834	£3,302	£9,733
408.09	ST22	BRIDGE 13	Bridge: Vehicular (single span)	Br24: Carriageway surfacing	4.43	Carriageway surfacing	Carriageway surfacing: replacement	£13,144	£1,958	£7,752	£22,855
407.92	ST37	BRIDGE 22	Bridge: Vehicular (single span)	Br10: Spandrel/Wallhead Vial	4.61	Brickwork	Structure replaced				£3,824
407.89	ST06	BRIDGE 03	Bridge: Vehicular (single span)	Br23: Handrail/Parapet/Safety Fences	4.14	Other/Unknown Handrail/Parapet/Safety	Parapet: Replacement	£12,520	£3,043	£9,122	£24,686
407.89	ST37	BRIDGE 22	Bridge: Vehicular (single span)	Br08: Foundations	4.48	Foundation Material	Structure replaced				£2,411
407.77	ST37	BRIDGE 22	Bridge: Vehicular (single span)	Br31: Wing Walls	4.37	Other/Unknown Material	Structure replaced				£45,745
11.08	ST36	BRIDGE 21	Bridge: Vehicular (4 or more spans)	Br19: Finishes: Deck Elements	4.94	Other/Unknown Finish	Finishes: WetDry surface preparation and re-application of finish	£72,501	£0	£31,719	£104,220
10.08	ST10	BRIDGE 06	Bridge: Vehicular (2 or 3 spans)	Br15: Superstructure Drainage	5.00	Other/Unknown Drainage System	Drainage: Replacement	£3,065	£2,319	£3,873	£9,260
9.91	ST56	RETAINING WALL 07	Retaining Wall (height > 3m)	Rw08: Finishes: Handrail/Parapet	4.82	Other/Unknown Finish	Finishes: WetDry surface preparation and re-application of finish	£58,837	£65,722	£46,093	£170,653
9.37	ST34	CULVERT 11	Culvert (multi-cell)	Br26: Invert/River Bed	3.45	Other/Unknown Invert Material	Invert repair	£3,717	£0	£3,569	£7,286
9.26	ST36	BRIDGE 21	Bridge: Vehicular (4 or more spans)	Br13: Bearings	3.24	Other/Unknown Bearing	Bearings: Replacement	£39,852	£0	£39,850	£79,702
8.19	ST44	RETAINING WALL 01	Retaining Wall (height > 3m)	Rw12: Footway/Verge: Top of Wall	3.97	Carriageway surfacing	Carriageway surfacing: maintenance	£8,816	£1,112	£5,150	£15,078
8.13	ST46	GANTRY 01	Sign/Signal Gantry (spanning)	Sp06: Finishes: Columns/Supports	5.00	Other/Unknown Finish	Finishes: WetDry surface preparation and re-application of finish	£4,015	£2,783	£4,968	£11,767
8.08	ST09	BRIDGE 05	Bridge: Vehicular (single span)	Br19: Finishes: Deck Elements	5.00	Other/Unknown Finish	Finishes: WetDry surface preparation and re-application of finish	£9,543	£0	£5,344	£14,886
				Br22: Retaining Walls	5.00	Other/Unknown Material	Maintenance/Repair of Other/Unknown Materials	£103,014	£0	£57,888	£160,702
8.06	ST41	RETAINING WALL 01	Retaining Wall (height > 3m)	Rw12: Footway/Verge: Top of Wall	3.91	Footway surfacing	Footway surfacing: maintenance	£4,901	£1,112	£5,150	£11,163
8.05	ST42	RETAINING WALL 02	Retaining Wall (height > 3m)	Rw10: Carriageway: Top of Wall	3.76	Carriageway surfacing	Carriageway surfacing: maintenance	£5,348	£1,349	£5,673	£12,369
8.03	ST06	BRIDGE 03	Bridge: Vehicular (single span)	Br21: Finishes: Parapets/Safety Fences	5.00	Other/Unknown Finish	Finishes: WetDry surface preparation and re-application of finish	£5,281	£1,362	£3,862	£10,496
8.0	ST07	CULVERT 04	Culvert (single cell)	Br15: Superstructure Drainage	4.98	Other/Unknown Drainage System	Drainage: Replacement	£187	£0	£180	£367
8.59	ST55	EARTH RETAINING WALL 02	Structural Earthworks - Reinfor	Br10: Carriageway: Top of Wall	3.99	Carriageway surfacing	Carriageway surfacing: maintenance	£6,793	£1,713	£7,206	£15,712
8.5	ST39	SUBWAY	Underpass (or Subway): Pedes	Br19: Finishes: Deck Elements	5.00	Other/Unknown Finish	Finishes: WetDry surface preparation and re-application of finish	£9,072	£0	£8,709	£17,781
8.45	ST01	CULVERT 01	Culvert (single cell)	Br15: Superstructure Drainage	5.00	Other/Unknown Drainage System	Drainage: Replacement	£187	£0	£180	£367
	ST38	BRIDGE 23	Bridge: Vehicular (single span)	Br32: Retaining Walls	5.00	Other/Unknown Material	Structure replaced				£79,033
7.37	ST29	BRIDGE 18	Bridge: Vehicular (2 or 3 spans)	Br01: Primary Deck Element	3.22	Brickwork	Masonry repairs	£8,498	£0	£5,778	£14,276
8.36	ST25	CULVERT 10	Culvert (single cell)	Br26: Invert/River Bed	4.70	Other/Unknown Invert Material	Invert repair	£107	£0	£103	£209
8.33	ST57	PUMPING STATION	Chamber/Cellar/Vault	Br24: Carriageway surfacing	3.79	Carriageway surfacing	Carriageway surfacing: maintenance	£3,568	£0	£3,423	£6,991
8.3	ST54	EARTH RETAINING WALL 01	Structural Earthworks - Reinfor	Rw19: Carriageway: Top of Wall	3.80	Carriageway surfacing	Carriageway surfacing: maintenance	£8,793	£1,713	£7,206	£15,712
8.26	ST29	BRIDGE 18	Bridge: Vehicular (2 or 3 spans)	Br10: Spandrel/Wallhead Vial	3.26	Brickwork	Masonry repairs	£2,166	£0	£1,473	£3,639
8.19	ST29	BRIDGE 18	Bridge: Vehicular (2 or 3 spans)	Br09: Abutments (incl. Arch Springing)	3.18	Brickwork	Masonry repairs	£37,216	£0	£25,307	£62,523
8.02	ST08	BRIDGE 04	Bridge: Vehicular (single span)	Br21: Finishes: Parapets/Safety Fences	4.02	Other/Unknown Finish	Finishes: WetDry surface preparation and re-application of finish	£4,685	£1,870	£5,185	£11,520
7.97	ST08	BRIDGE 04	Bridge: Vehicular (single span)	Br25: Footway/verge/footbridge surfacing	3.98	Footway surfacing	Footway surfacing: maintenance	£432	£63	£440	£935
7.78	ST33	FOOTBRIDGE 02	Bridge: Pedestrian/Cycle (single span)	Br25: Footway/verge/footbridge surfacing	5.00	Footway surfacing	Footway surfacing: replacement	£2,734	£0	£2,626	£5,360
7.75	ST20	BRIDGE 11	Bridge: Vehicular (single span)	Br05: Tie Beam/Rod	3.92	Cast Iron or Wrought Iron	Metalswork repair	£2,911	£0	£1,830	£4,741
7.74	ST17	BRIDGE 09	Bridge: Vehicular (single span)	Br24: Carriageway surfacing	3.99	Carriageway surfacing	Carriageway surfacing: maintenance	£1,131	£355	£1,228	£2,713

LONG-TERM ASSET MANAGEMENT PLANNING

Once Long-term AMP has been run, the LAMP Dashboard, LAMP Results and ECS Profile will automatically appear in SAVI

*The LAMP Dashboard, LAMP Results and ECS Profile will be located adjacent to the input tabs (or the *Element List*, if short-term AMP has already been run) at the bottom of the Excel screen.*



Within the 'View Outputs' group on the SAVI Ribbon, the *Long-term AMP* button will now be active, as there are now results to display. The user can click on this *Long-term AMP* button to move directly to the *LAMP Dashboard*.

LAMP DASHBOARD

The LAMP Dashboard summarises the expenditure, risk and condition indicator profile for the structures stock, over the defined number of years

An asset manager may use the *LAMP Dashboard* as evidence to support business case development, funding applications, and report predicted condition and risk based on the defined spend. Alternative strategies can be compared in terms of performance and whole-life cost.

Click on the tiles of the *LAMP Dashboard* for more information.



LAMP RESULTS

The *LAMP Results* provide a detailed breakdown of expenditure, risk and condition for each year of the defined number of years

A user may use the data within *LAMP Results* to generate specific graphs and outputs, as evidence to support business case development, funding applications, report predicted condition and risk based on the defined spend.

Click on the sections of the *LAMP Results* for more information.

SAVI				SSClev					Number of Structures in the condition band					Count of safety and performance risk		
Year of Analysis	Workbank	Expenditure	Discounted Expenditure	Bridges	Retaining Walls	Culverts	Sign/Signal Gantries	High Mast Lighting	Very good	Good	Fair	Poor	Very poor	0-10m	10-20m	20m+
0																
1	£2,336,980	£198,111	£198,111	84.9	85.9	88.4	89.0	55.5	26	25	6	6	0	6.00	0.00	1.00 £
2	£2,542,168	£0	£0	84.0	85.1	88.0	86.2	55.5	25	24	7	7	0	9.00	0.00	1.00 £
3	£2,874,099	£1,232,973	£1,150,994	87.7	84.2	86.9	83.8	55.5	23	27	7	6	0	8.00	0.00	1.00 £
4	£1,918,005	£456,570	£411,800	87.8	83.7	86.3	88.3	50.3	21	32	5	5	0	3.00	0.00	0.00 £
5	£1,862,018	£542,233	£472,524	88.2	83.0	89.1	88.6	50.3	24	29	5	5	0	2.00	0.00	0.00 £
6	£1,813,133	£34,129	£28,736	87.5	82.5	87.4	92.8	50.3	23	30	5	5	0	1.00	0.00	0.00 £
7	£2,228,550	£382,180	£310,903	86.8	81.4	85.9	91.4	50.3	19	34	5	5	0	0.00	0.00	0.00 £
8	£1,926,685	£869,186	£683,173	85.4	83.4	84.4	89.6	50.3	14	40	4	5	0	0.00	0.00	0.00 £
9	£1,389,209	£692,974	£526,253	86.4	82.3	83.1	88.1	50.3	13	41	4	5	0	1.00	0.00	0.00 £
10	£1,359,112	£218,576	£160,378	86.0	84.4	82.0	88.0	50.3	13	38	7	5	0	1.00	0.00	0.00 £
11	£1,519,846	£749,395	£531,260	85.2	86.7	81.4	89.4	50.3	13	35	10	5	0	0.00	0.00	0.00 £
12	£2,793,624	£87,395	£59,861	83.7	87.6	78.6	86.7	39.5	9	34	15	0	5	3.00	0.00	0.00 £
13	£3,002,041	£684,163	£452,768	84.0	86.4	81.3	85.0	39.5	5	35	18	0	5	4.00	0.00	0.00 £
14	£2,678,802	£159,639	£102,074	83.2	85.3	80.5	80.8	39.5	3	36	19	0	5	3.00	1.00	0.00 £
15	£2,903,692	£1,025,847	£633,750	82.4	84.6	78.5	86.1	39.5	5	35	18	0	5	1.00	0.00	0.00 £
16	£2,422,693	£451,165	£269,296	82.9	83.9	77.8	91.4	39.5	7	32	19	0	5	1.00	0.00	0.00 £
17	£2,454,071	£502,811	£289,974	82.4	87.5	82.1	92.3	31.0	9	33	16	0	5	6.00	0.00	0.00 £
18	£2,542,826	£587,929	£327,587	82.8	86.8	80.4	91.2	100.0	11	36	15	1	0	0.00	0.00	0.00 £
19	£2,319,419	£548,286	£295,176	83.0	87.8	82.1	88.6	100.0	13	34	15	1	0	2.00	0.00	0.00 £
20	£2,407,811	£80,075	£41,651	81.8	87.1	81.7	86.8	100.0	13	29	20	1	0	1.00	0.00	0.00 £

The ECS Profile documents the condition score of each element, for each year of the defined number of years

A user may use the ECS Profile to visually assess the condition of individual elements over the duration of the long-term analysis.

A colour grading system is used to identify elements that are approaching condition 5B (i.e. elements approaching the end of their consumable life). At one end of the spectrum, elements in new condition are shaded in green and at the other end elements which are in poor condition are shaded in red. Elements are shaded across this spectrum according to their current condition.

SAVI				Reported ECS at the End of Year...																																	
Element ID (in this model)	ID of Structure or Group of Structures (in this model)	Identifier of Structure or Group of Structures	Full Name of Element	EIF	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
1	1	ST01	B-01. Primary Deck Element	2.0	8.8	8.8	8.8	8.7	2.0	2.0	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.7	8.0	8.0	8.1	8.1	8.8	8.8	8.8	8.8	8.7	8.7	8.7	8.7	8.7	8.7
2	1	ST01	B-05. Tie Beam/Rod	2.0	2.7	2.7	3.0	3.1	3.1	3.3	3.3	3.3	3.7	3.7	4.0	2.0	2.0	2.1	2.1	2.1	2.3	2.3	2.3	2.3	2.7	2.7	3.0	3.1	3.1	3.1	3.3	3.3	3.3	3.7	3.7	3.7	3.7
3	1	ST01	B-08. Foundations	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4	1	ST01	B-09. Abutments (incl. Arch Springing)	1.5	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.7	3.0	3.1	2.0	2.0	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.0	3.1	3.1	3.1	3.1
5	1	ST01	B-10. Spandrel Wall/Head Wall	1.5	2.0	2.0	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7	3.0	3.1	8.1	8.1	8.1	8.1	8.1	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
6	1	ST01	B-15. Superstructure Drainage	1.2	5.0	5.0	5.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.1	2.8	2.8	2.8	2.7	2.7	2.7	3.1	3.1	3.3	3.3	3.3	3.7	3.7	4.0	4.1	4.8	4.8	4.8	4.8
7	1	ST01	B-23. Handrail/Parapets/Safety Fences	1.5	3.0	3.1	3.3	3.7	2.0	2.0	2.1	2.1	2.8	2.8	2.8	2.7	2.7	2.7	3.1	3.3	3.3	3.7	4.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
8	1	ST01	B-24. Carriageway surfacing	1.5	3.7	4.0	4.1	4.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
9	1	ST01	B-26. Invert/River Bed	1.2	2.0	2.1	2.1	2.8	2.8	2.8	2.8	2.7	2.7	3.0	3.1	3.1	3.3	3.3	3.8	3.8	3.7	3.7	3.7	3.7	2.0	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.1
10	2	ST02	B-08. Foundations	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
11	2	ST02	B-09. Abutments (incl. Arch Springing)	1.5	1.0	1.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
12	2	ST02	B-15. Superstructure Drainage	1.2	1.0	1.0	1.0	2.1	2.1	2.8	2.8	2.8	2.7	2.7	3.0	3.1	3.3	3.3	3.3	3.7	3.7	4.1	4.1	4.3	4.3	4.3	4.7	4.7	5.0	5.0	5.0	1.0	1.0	1.0	1.0	1.0	
13	2	ST02	B-17. Waterproofing	1.2	5.0	5.1	5.3	5.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
14	2	ST02	B-23. Handrail/Parapets/Safety Fences	1.5	2.0	2.1	2.1	2.8	2.8	2.8	2.8	2.7	2.7	3.1	3.1	3.8	3.7	4.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
15	2	ST02	B-24. Carriageway surfacing	1.5	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	3.0	3.0	3.1	3.1	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
16	2	ST02	B-25. Footway/verge/footbridge surfacing	1.2	2.7	3.0	3.1	3.3	2.0	2.1	2.1	2.8	2.8	2.8	2.7	2.7	3.0	3.1	2.0	2.1	2.1	2.8	2.8	2.8	2.8	2.8	3.0	3.1	3.3	3.3	3.7	3.7	3.7	3.7	4.0	4.1	
17	2	ST02	B-26. Invert/River Bed	1.2	2.0	2.1	2.1	2.8	2.8	2.8	2.8	2.7	2.7	3.0	3.1	3.1	3.8	3.8	2.0	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
18	2	ST02	B-29. River Training Works	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
19	2	ST02	B-31. Wing Walls	1.5	3.7	3.7	4.1	4.1	2.0	2.0	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
20	2	ST02	B-32. Retaining Walls	1.2	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
21	2	ST02	B-33. Embankments	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
22	3	ST03	B-01. Primary Deck Element	2.0	1.0	1.0	1.0	1.0	1.0	2.0	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.7	2.7	8.0	8.1	8.1	8.1	8.8	8.8	8.8	8.8	8.7	8.7	8.7	8.7	8.7
23	3	ST03	B-08. Foundations	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
24	3	ST03	B-10. Spandrel Wall/Head Wall	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
25	3	ST03	B-24. Carriageway surfacing	1.5	2.7	2.7	2.7	3.0	3.0	3.1	3.1	3.1	3.3	3.3	3.3	3.3	3.7	3.7	3.7	4.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
26	3	ST03	B-25. Footway/verge/footbridge surfacing	1.2	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.1	2.8	2.8	2.8	2.7	2.7	2.7	3.1	3.1	3.3	3.3	3.3	3.3	3.3	2.0	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	
27	3	ST03	B-26. Invert/River Bed	1.2	1.0	1.0	1.0	1.0	1.0	2.0	2.1	2.8	2.8	2.8	2.8	2.7	2.7	2.7	3.0	3.1	8.1	8.1	8.1	8.1	8.1	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	
28	3	ST03	B-33. Embankments	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.8	2.8	2.8	2.8	2.7	2.7	2.7	8.0	8.1	8.8	8.8	8.8	8.7	4.0	4.1	4.8	4.7	4.8	4.7	
29	4	ST04	B-01. Primary Deck Element	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
30	4	ST04	B-08. Foundations	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
31	4	ST04	B-09. Abutments (incl. Arch Springing)	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
32	4	ST04	B-10. Spandrel Wall/Head Wall	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
33	4	ST04	B-17. Waterproofing	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.1	2.1	2.8	2.8	2.8	2.7	2.7	3.0	3.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
34	4	ST04	B-23. Handrail/Parapets/Safety Fences	1.5	2.0	2.1	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7	3.0	3.1	3.1	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	
35	4	ST04	B-24. Carriageway surfacing	1.5	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7	3.0	3.1	3.1	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	
36	4	ST04	B-26. Invert/River Bed	1.2	1.0	2.0	2.1	2.8	2.8	2.8	2.8	2.7	2.7	2.7	3.0	3.1	3.1	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	
37	4	ST04	B-31. Wing Walls	1.5	3.1	3.3	3.3	3.7	3.7	4.0	2.0	2.0	2.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	
38	5	ST05	B-01. Primary Deck Element	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
39	5	ST05	B-02. Transverse Beams	2.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1		
40	5	ST05	B-06. Parapet Beam or Cantilever	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1																							

