UK Pavement Management System

Technical Note 46 – Part 2

Financial Information to support Asset Management
Guidance notes for UKPMS Developers
Footways & Cycletracks

Version Number 3.00 - Issue

February 2021

Document Information

Title (Sub Title)	Technical Note 46 – Part 2 Financial Information to support Asset Management Guidance notes for UKPMS Developers Footways & Cycletracks
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Description	This Technical Note provides guidance for UKPMS Developers to produce footway and cycletrack information required by HAMFIG.

Document History

Version No	***Status***	***Author***	***Date***	***Changes from Previous Version***
0.01	Draft	RAC	18.06.13	First draft based on 2012/13 version but revised to remove date specific references so that the Technical Note applies to any year from 2013/14 onwards until further notice.
0.02	Draft	RAC	05.07.13	Transferred to new template.
0.03	Draft	RAC	31.07.13	Reviewed by JMG
1.00	Issue	RAC	21.08.13	Ratified by HAMFIG at their meeting on 19-Aug-13
1.01	Draft	RAC	14.01.19	The website references have been updated
1.02	Draft	RAC	18.01.19	Reviewed by CCS
1.03	Draft	RAC	12.03.19	References to CIPFA documentation have been updated
2.00	Issue	RAC	18.03.19	Ratified by Chris Allen-Smith for HAMFIG
2.01	Draft	RAC	02.02.21	Draft based on version 2.00 but revised as follows: ▪ Website references updated ▪ References to archive documents removed
2.02	Draft	RAC	10.02.21	Reviewed by CCS
3.00	Issue	RAC	17.02.21	Ratified by Chris Allen-Smith for HAMFIG

Document Owner

The owner of this document is the Highway Asset Management Financial Information Group (HAMFIG).

Document Support

Support for this document is provided by Linhay Consultancy Ltd and Hyperion Infrastructure Consultancy Ltd who can be contacted via ukpms@hyperion-uk.com. These organisations have been appointed as the UKPMS system accreditors by the UK Roads Board.

This document can be found online on the RCMG website.

Introduction

This Technical Note provides guidance for UKPMS Developers to allow them to produce various reports for financial information to support asset management as requested by the Highways Asset Management Financial Information Group (HAMFIG).

Part 1 of the Technical Note gives the requirements for carriageways.
Part 2 of the Technical Note (this document) gives the requirements for footways and cycletracks (and paved verges where these are differentiated from footways).

This document provides:

- **Changes since the last version**
- **Background Information** on data requirements
- **Accumulated Depreciation** requirements for footways, cycletracks and paved verges
- **Annual Depreciation** requirements for footways, cycletracks and paved verges
- **Inventory Reporting Requirements** for the contribution to the calculation of the gross replacement cost (GRC) for footways, cycletracks and paved verges

Changes since last version

The website references have been updated and references to archived documents have been removed.

Background Information

The purpose of the HAMFIG reports is to assist with the provision of financial information to support asset management for footways and cycletracks (and paved verges where these are differentiated from footways). The requirements are based on inventory data and on FNS, CVI and DVI condition data. The data are processed using the Automatic Pass.

The Highways Network Asset Code describes an approach which relies on separating footways out into three categories, namely bituminous, concrete modular and other. To use this approach it is therefore important that the data collected provide sufficient information to distinguish between these categories:

- For CVI and DVI the UKPMS pavement type is collected as part of the survey.
- For FNS there are two alternatives:
    - The data may be collected using a 'known' pavement type (as for CVI and DVI)
    - The data may be collected using the 'unknown' pavement type; if so, the pavement type must be available from elsewhere. Typically this will be from inventory data but it may be from other sources of information.

The categories used in the Code do not correspond exactly to the existing UKPMS pavement types (block paved, bituminous, concrete, flagged and unknown). The most appropriate mapping from the UKPMS pavement types to the categories given in the Code will depend on the types of materials used locally and the way in which the UKPMS pavement types have been implemented locally. A typical mapping might be:

HAMFIG	***UKPMS***
Bituminous	Bituminous
Concrete modular	Block paved
	Flagged
Other	Concrete
	Unknown

However, authorities should be able to adapt this to suit local practice.

Accumulated Depreciation

It is recognised that many authorities will not yet have built up full inventory and condition information for all footways (cycletracks and paved verges). UKPMS is, therefore, required to provide generic reports giving coverage (inventory and survey), inventory quantities and treatment quantities. This information may be provided in a single report or via multiple reports which together give the required outputs. These results can then be extracted by the local authority and used in the way which best reflects their local practice.

Processing

The data are processed using an Automatic Pass with RP10.01 or later. The Automatic Pass will typically be required to use data from several years; the dates are entered by the user to allow flexibility with the survey timetable. The Automatic Pass merge method and parameters are set by the user to best reflect their asset management practices.

Running the report

User Input

To run the report the user selects:

- The Automatic Pass(es) to use

Report Contents

Footways

The report contents for footways are as follows:

Ref	***Description***
1	Local Authority name
2	Report run time
3	UKPMS system
4	UKPMS system version
5	For each Automatic Pass included:

Ref	Description
	a. Run identifier b. Rule Set identifier c. Run date d. Date range for survey data e. Automatic Pass run parameters
6	For each section footway hierarchy: a. Network Sections (number, 0dp) b. Network Length (km, 3dp) c. Inventory Coverage – number of sections (number, 0dp) d. Inventory Coverage - length of sections (km, 3dp) e. Survey Coverage - number of sections (number, 0dp) f. Survey Coverage – length of sections (km, 3dp)
7	For each feature hierarchy and construction type: a. Inventory Length (km, 3dp) b. Inventory Area (m^2, 0dp)
8	For each feature hierarchy, pavement type and generic treatment: a. Treatment Length (km, 3dp) b. Treatment Area (m^2, 0dp)

Notes:

1. Network Length (Ref 6b) is the sum of the section lengths for all sections in the group
2. Inventory Coverage (Ref 6c and 6d) is the number of sections in the group which have any footway inventory records, and the sum of the sections lengths for those sections.
3. Survey Coverage (Ref 6e & 6f) is based on those sections which have footway survey data for the Automatic Pass(es) included. It is expressed as a number of sections and as the sum of the section lengths for those sections.
4. Inventory Length (Ref 7a) is defined as:
   $$\sum(I_E - I_S)$$
   Where:
   I_E the Inventory End Chainage,
   I_S is the Inventory Start Chainage
   and the sum is performed over all footway inventory records in the group
5. Inventory Area (Ref 7b) is defined as:
   $$\sum 0.5*(I_E - I_S)*(W_E + W_S)$$
   Where:
   W_E is the Inventory End Width,
   W_S is the Inventory Start Width
   and the sum is performed over all footway inventory records in the group
6. Treatment Length (Ref 8a) is defined as:
   $$\sum(L_E - L_S)$$
   Where:
   L_E the Defect Length End Chainage,
   L_S is the Defect Length Start Chainage
   and the sum is performed over all footway defect lengths in the group

7. Treatment Area (Ref 8b) is defined as:

$$\sum(A)$$

Where:

A the quantity of treatment for the defect length

and the sum is performed over all footway defect lengths in the group

8. UKPMS contains two attributes connected with footway hierarchy. The first is the 'footway hierarchy' attribute which stored at the section level. This provides a default footway hierarchy used if no hierarchy information is available from the footway inventory. This attribute is used for the network figures (Ref 6) because these figures include sections without footway inventory. For the Inventory Length and Inventory Area (Ref 7) the more detailed inventory attribute 'feature hierarchy' is available and is used to define the groups. And similarly, for the Treatment Length and Treatment Area (Ref 8) the defect length attribute 'feature hierarchy' is used to define the groups. This attribute is populated using the inventory attribute 'feature hierarchy' where available; where this isn't available then the section 'footway hierarchy' is assigned to the defect length 'feature hierarchy' as a default.
9. Some treatment rules in UKPMS trigger multiple generic treatments. For example, in RP10.01 there is a treatment rule for bituminous footways which triggers a treatment of 'Surface Improvement' plus 'Localised Treatment'. It is recognised that each UKPMS system may handle this situation differently. For some systems the defect length will contribute to the treatment length and treatment area just once i.e. to one of these generic treatment groups (or perhaps to a composite generic treatment heading); while for other systems the defect length will contribute to both generic treatment groups. Either approach is acceptable, but the report must indicate clearly which approach is being used so that the user can interpret the results appropriately.

Cycletracks (and paved verges)

Similar reports are required for cycletracks (and paved verges) but here the requirements are somewhat simpler as there is no requirement to subdivide by hierarchy. The report contents for cycletracks (and paved verges) are:

Ref	***Description***
1	Local Authority name
2	Report run time
3	UKPMS system
4	UKPMS system version
5	For each Automatic Pass included: a. Run identifier b. Rule Set identifier c. Run date d. Date range for survey data e. Automatic Pass run parameters

Ref	*Description*
6	For the whole network: a. Network sections (number, 0dp) b. Network Length (km, 3dp) c. Inventory Coverage – number of sections (number, 0dp) d. Inventory Coverage - length of sections (km, 3dp) e. Survey Coverage - number of sections (number, 0dp) f. Survey Coverage – length of sections (km, 3dp)
7	For each construction type: a. Inventory Length (km, 3dp) b. Inventory Area (m^2, 0dp)
8	For each pavement type and generic treatment a. Treatment Length (km, 3dp) b. Treatment Area (m^2, 0dp)

Annual Depreciation

Report Calculations

For bituminous footways the calculation of annual depreciation is based on a life cycle approach. Currently UKPMS does not contain functionality to support this but this may be developed in the future.

For modular footways the annual depreciation is evaluated by considering the area of footway needing treatment at the previous reporting date and comparing this with the area needing treatment at the current reporting date. The difference in area is then multiplied by the current cost rate. The report described above in **Accumulated Depreciation** also provides the information required for this calculation. By processing the condition data using appropriate date ranges the area requiring treatment can be obtained first for the previous reporting date and then for the current reporting date.

Inventory Reporting Requirements (GRC)

The HAMFIG requirement is for reports based on inventory data. This information may then be copied to an external spreadsheet (published as supporting material to the Highways Network Asset Code) and used to calculate the Gross Replacement Cost (GRC) for footways and cycletracks.

Separate reports are required for footways, cycletracks and paved verges.

Network Grouping

The inventory results are split into groups. The user must be able to define the groups interactively when running each report, using up to three of the following attributes:

- **Section**
  - Road hierarchy
  - Urban or Rural

  - Speed Limit
  - Road Type
  - DfT Classification

- **Inventory**
  - Feature hierarchy (footways only)
  - Construction Type

Some examples of typical group definitions are:

- **Footways:** Feature hierarchy split by rural/urban and construction type (block paved, bituminous, concrete, flagged, unknown).
- **Cycletracks & Paved Verges:** Split by rural/urban and construction type (block paved, bituminous, concrete, flagged, unknown).

The number of nesting levels required by UKPMS systems has been limited to three in order to facilitate the design of readable reports. It is anticipated that if more detailed discrimination is required in the future this will be part of a more sophisticated model, beyond the scope of the simple GRC model described here.

Report Contents

The inventory information provided for each group is:

- Total Inventory Length, defined as:

  $$\sum (I_E - I_S)$$

  Where:

  I_E the Inventory End Chainage,
  I_S is the Inventory Start Chainage
  and the sum is performed over all footway, cycletrack or verge inventory records in the group
- Total Inventory Area, defined as:

  $$\sum 0.5 * (I_E - I_S) * (W_E + W_S)$$

  Where:

  W_E is the Inventory End Width,
  W_S is the Inventory Start Width
  and the sum is performed over all footway, cycletrack or verge inventory records in the group
- Calculated average width (i.e. Total Inventory Area divided by Total Inventory Length for the group)