



the ukpms user manual
Volume 1 – UKPMS Fundamentals
Chapter 2 – Beginner’s Guide to UKPMS

Document Information

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| Title (Sub Title) | The UKPMS User Manual Volume 1 – UKPMS Fundamentals Chapter 2 – Beginner’s Guide to UKPMS |
| Product Number | UKPMS Manual_01_02 |
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| Description | This Chapter is intended to provide a brief overview of UKPMS and is aimed at senior managers or other decision makers within organisations who wish to know more about UKPMS or who may be considering investing in a pavement management system within the wider context of an asset management regime. |

Document History

| Version No | Status | Author | Date | Changes from Previous Version |
|-------------------|---------------|---------------|-------------|--|
| 01 | Draft | CCS | 10.12.2004 | First release for internal review |
| 02 | Draft | CCS | 17.12.2004 | Minor amendments made, cross-references to other parts of the UKPMS User Manual inserted |
| 03 | Issued | CCS | 11.03.2005 | Comments from UKPMS Steering Group Reviewers incorporated. New document style applied. Cross-references updated. |

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0. Preamble

This Chapter is intended to provide a brief overview of UKPMS and is aimed at senior managers or other decision makers within organisations who wish to know more about UKPMS or who may be considering investing in a pavement management system within the wider context of an asset management regime.

1. Why is Pavement Management Important?

Pavement Management is a business-like approach to the management of paved highway assets, including roads, kerbs, footways and cycle-tracks. The overall aim of pavement management is to maintain and improve the paved highway asset to support its current and future use in an efficient and safe manner, through the systematic assessment of condition and the identification and prioritisation of maintenance need.

As paved assets comprise by far the largest part of the highway network, efficient pavement management forms a vital component of any successful Transport Asset Management regime and it is essential for Local Authorities to be able to demonstrate effective pavement management processes within their Highway and Transport Asset Management Plans.

In addition, effective pavement management delivers real benefits in the form of financial and economic savings resulting from more appropriate and more timely maintenance treatments. The adoption of a systematic approach to pavement management is therefore considered to be good practice and is endorsed in *Delivering Best Value: A Code of Practice for Highway Maintenance (IHT, 2001)*. More detailed information about the benefits of UKPMS and about how UKPMS fits into a wider context of Asset Management is provided in Volume 1, Chapter 3 “Implementation Guide” and Volume 5, Chapter 2 “Best Practice” and Chapter 3 “Asset Management” of this User Manual respectively.

2. What is UKPMS?

The UK Pavement Management System (UKPMS) is the national standard for management systems for the assessment of local road network conditions and for the planning of investment and maintenance on paved areas of roads, kerbs, footways and cycle-tracks on local roads within the UK.

In general, all pavement management systems consist of a representation of a road network divided into uniquely referenced road lengths. Against this network, it is possible to locate other data including condition data collected by visual or machine surveys and inventory such as construction details and width information. By applying rules to the condition data held against each section it is possible to identify potential maintenance treatments and these treatments can be prioritised by condition or in an order that will give best value for money in the long term.



the ukpms user manual

Volume I – UKPMS Fundamentals

Chapter 2 – Beginner's Guide to UKPMS

Pavement Management Systems that have been fully accredited to the UKPMS standard have successfully demonstrated a wide range of highway maintenance management functionality, including the following:

- Location and referencing of highways, including footways and cycle-tracks
- Recording of an inventory of maintainable assets within the highway
- Recording of condition data collected from various visual and machine surveys
- Projection of future condition based on historic deterioration, and on engineering models of deterioration for given construction types and pavement life profiles¹
- Selection of options and requirements for remedial works
- Costing of potential works
- Management of budgets
- Analysis of budgetary and maintenance needs for highway networks
- Prioritisation of potential works on a condition basis
- Prioritisation of potential schemes of work using econometric principles

The primary use of UKPMS is to assist Local Authorities in the planning of maintenance on the local road network through the systematic collection and analysis of condition data. As described above, this is recommended as good practice and is a vital component of an effective Highway Asset Management regime. UKPMS supports Local Authorities' maintenance management objectives by providing facilities to:

- Identify lengths of paved asset in need of maintenance, including treatment options and costs
- Prioritise maintenance schemes to give best value for money
- Identify network trends

The other area where UKPMS plays a vital part is in supporting the Best Value regime. Because the UKPMS approach ensured consistency between the different pavement management systems operated by different Local Authorities, the Department for Transport made it a requirement for UKPMS to be used for the production of the following Best Value Performance Indicators relating to the condition of local roads and footways:

- BV96 Condition of Principal Roads
- BV97 Condition of Non-principal Roads
- BV186 Roads not needing major repair
- BV187 Condition of footways

Current, detailed requirements for these BVPIs are available from the DfT website (<http://www.dft.gov.uk>) and in Volume 4, Chapter 5 "BVPIs" of

¹ Concerns have been expressed about the accuracy of condition projection within UKPMS, particularly when applied to longer future periods. Research is currently underway that will attempt to resolve this issue; until this research is complete, authorities should be cautious when interpreting the outputs from condition projection.



the ukpms user manual

Volume I – UKPMS Fundamentals

Chapter 2 – Beginner’s Guide to UKPMS

this User Manual. In Scotland, UKPMS is used to produce Scottish Performance Indicators (SPIs) and National Assembly for Wales Performance Indicators (NAWPIs) are also produced. More detailed information about BVPIs is provided in Volume 5, Chapter 4 “Guidance on BVPIs for Elected Members and District Auditors” in this User Manual.

2.1 UKPMS Accreditation

It is important to note that UKPMS is not a pavement management system, but is a specification for those functions where national consistency and comparability are required. Commercial system suppliers are encouraged to incorporate those key aspects of UKPMS within their systems, and a central testing programme ensures comparability with the UKPMS standard. The aims of UKPMS Comparability Testing are:

- To encourage and obtain the addition of UKPMS functionality to existing highway management systems, in line with user requirements for the prioritisation of structural maintenance works on locally funded highways and on principal roads
- To achieve a logical and manageable sequence of phased development and release by approved suppliers
- To ensure national consistency of systems and data through the application of comparability tests leading to the award of a ‘UKPMS Stamp of Approval’ to successful systems

Testing of UKPMS systems is organised in three ‘Tranches’ of functionality, although accreditation is only gained when tests for all three Tranches have been passed.

Tranche 1 This is the first step required to set up a 'UKPMS' database. It includes all the necessary input and validation routines for the following data

- Road Network Referencing
- Highway Inventory
- Visual Survey Condition Data
- Machine Survey Condition Data

Tranche 2 This stage in UKPMS introduces the functionality to analyse the recorded condition data and produce treatment recommendations, according to the ‘rules’ stored in the system. This process is known as the ‘Automatic Pass’.

A priority for these lengths requiring treatment is assigned according to the simple ‘worst condition first’ basis. The rules applied can be taken from a default (national) set, or locally determined



the ukpms user manual
 Volume I – UKPMS Fundamentals
 Chapter 2 – Beginner’s Guide to UKPMS

- Tranche 3 In this, the third and final stage of building a UKPMS system, additional important functions are added to the Tranche 2 Automatic Pass including:
- Condition Projection
 - Economic Prioritisation - an alternative to the ‘worst condition first’ principle, in which priorities for maintenance are assigned on the basis of best value for money over a two year period
 - Projection and Monitoring of historic and future Network Condition Trends

2.2 Accredited Systems

As of March 2005, the following commercially available pavement management systems are fully UKPMS accredited. An up to date list of accredited systems is published on the UKPMS website (<http://www.ukpms.com>):

| Developer | System | More Information |
|-------------------|----------|--|
| Exor | Highways | www.exor.co.uk |
| FaberMaunsell | MARCHpms | www.marchgroup.demon.co.uk |
| Southbank Systems | Confirm | www.southbanksystems.com |
| Symology | Insight | www.symology.co.uk |
| WDM | WDMpms | www.wdm.co.uk |

Table 1. UKPMS Accredited Systems (as of March 2005)

It is important to be aware that each of these proprietary systems is different and offers different functionality. One of the strengths of the UKPMS approach is that Local Authorities are free to choose a pavement management system that meets their own particular needs, safe in the knowledge that those areas where national consistency is required fully meet the requirements of UKPMS.

Ongoing comparability of UKPMS accredited systems is monitored through an Annual Health Check test (scheduled for introduction in autumn 2005). The Annual Health Check provides ongoing routine assurance that UKPMS systems continue to meet UKPMS requirements including the current rule set and BVPI definitions.

The Annual Health Check is only carried out on fully accredited UKPMS systems and supplements rather than replaces the UKPMS Comparability Tests. Passing the Comparability Test continues to be a requirement for any new systems that wish to become UKPMS Accredited.

2.3 Managing Changes to UKPMS

Central to configuring UKPMS is the ‘Rule Set’, a self-contained set of rules, parameters and data, which allows users to apply either national standard or



the ukpms user manual

Volume I – UKPMS Fundamentals

Chapter 2 – Beginner’s Guide to UKPMS

locally derived rules in the processing of their data. The concept of a national, standard rule set means that any changes can be introduced and managed in a controlled, predictable way without the need for further comparability testing, which is both time-consuming and expensive.

Formal Rule Sets are released by the UKPMS Support Contractor in an annual cycle to meet the needs and timescales for both the production of Best Value Performance Indicators and, eventually, the Annual Health Check. For example, Rule Set RP5.01 will be used for reporting in 2005, RP6.01 in 2006 and so on. Interim Rule Sets may be released during the year but there is no formal requirement for them to be implemented by system developers until the next formal Rule Set is released. More detailed information about Rules and Parameters is provided in Volume 4, Chapter 4 “Rules and Parameters Rationale” in this User Manual.

3. Ownership & Support Arrangements

Funding for the original development work for UKPMS came 50 per cent from DfT and 50 per cent from 91 Local Authority sponsors from England, Scotland, Wales and the DRD Northern Ireland Roads Service. However, the original UKPMS specification was published and copyrighted by the Secretary of State for Transport on behalf of all owners and it can therefore be assumed that legal ownership of UKPMS is vested in the Secretary of State.

3.1 UKPMS Steering Group

Current administrative arrangements for UKPMS are shown in Figure 1. These arrangements have been put in place by DfT to provide more secure funding for the ongoing management, support and development of UKPMS. A UKPMS Steering Group (USG) operates under the remit of the Roads Board, which in turn reports to the Roads Liaison Group. The Chair of the USG is appointed by the Roads Board and its membership consists of Local Authority users, system suppliers, survey contractors and the DfT. Day-to-day management of UKPMS is provided by a UKPMS Support Contractor working under contract to DfT.

3.2 UKPMS Owners Forum

As well as reporting to the Roads Board, the strategic direction of the USG is steered by the Owners Forum. The role of the Owners Forum is to provide an independent voice to users and developers of UKPMS as well as to data providers and other stakeholders. The Owners Forum is a way of ensuring that:

- Members can influence the future direction of UKPMS
- Members have access to additional functionality on the UKPMS web site
- Members can participate in Owners Forum events
- Members are kept informed of UKPMS events and developments



the ukpms user manual

Volume I – UKPMS Fundamentals

Chapter 2 – Beginner’s Guide to UKPMS

Membership of the Forum is open to all, and is taken up by payment of a small annually renewable fee.

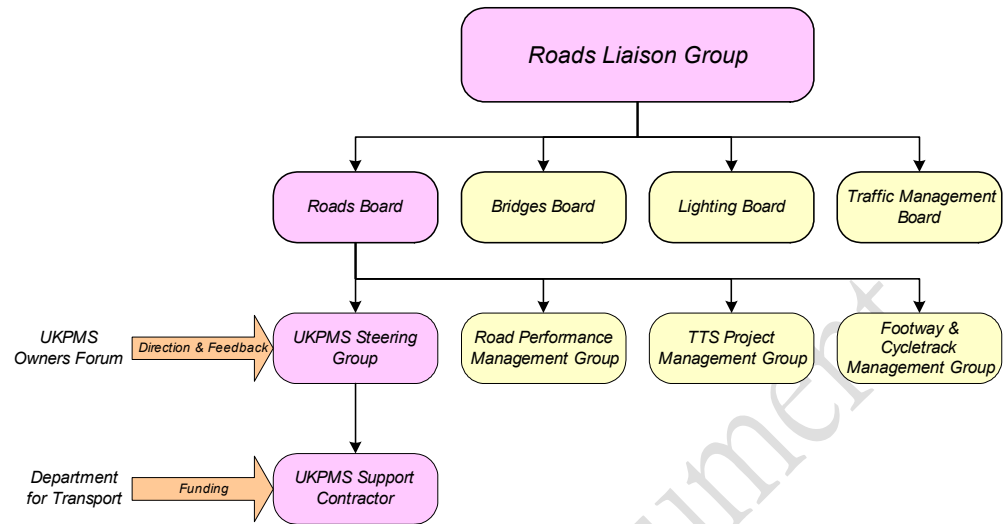


Figure 1. Administrative Arrangements for UKPMS

3.3 UKPMS Support Contractor

As described above, ongoing development of UKPMS and day-to-day support to users and developers is provided by the UKPMS Support Contractor. The scope of work of the UKPMS Support Contractor is as follows:

- Manage the comparability testing and accreditation regime
- Develop and extend the functionality of UKPMS to meet changing requirements and support system suppliers in the delivery of this functionality to users
- Undertake or manage research into UKPMS-related issues
- Actively promote the beneficial use of UKPMS
- Provide support to UKPMS users through the management of a telephone support service and website (<http://www.ukpms.com>)
- Liaise with other related groups and initiatives

The UKPMS Support Contractor can be contacted by email at support@ukpms.com.



4. Implementation Considerations

In planning for the implementation of UKPMS, a Local Authority should firstly establish their expectations in terms of benefit and value from the system. The choice of system, and the data requirements, will be very different between an organisation that is merely expecting UKPMS to provide Best Value Performance Indicators, and one that is looking for UKPMS to form an integral part of their highway asset management regime.

The next issue that is at least as important as the choice of an appropriate system is the establishment of a suitable data regime. Any organisation contemplating the use of UKPMS should be considering three interacting topics early in their deliberations:

- How they will reference their road networks
- The extent and accuracy of the Item Inventory they wish to establish
- The scope and composition of their Condition Survey regime

UKPMS is not prescriptive about any of these and allows considerable flexibility in order that an organisation may use the system in a way that best matches its particular requirements, capabilities and resources.

UKPMS also allows the user considerable flexibility in the types of data that are collected to support the operation of the system, and in the frequency and the level of detail at which those data are collected. Again, an organisation must consider what data they need collect to meet their particular needs and other issues, not least of which are the availability of funds and other resources. More specific guidance about implementing UKPMS, including guidance on making a business case for investment in UKPMS and the collection of UKPMS data is provided in Volume 1, Chapter 3 “Implementation Guide” in this User Manual.

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