

the ukpms user manual



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Volume 2

Visual Data Collection for
UKPMS
Chapter 3: DCD Software &
Accreditation



Document Information

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1 Data Capture Devices

Electronic Data Capture Devices (DCDs) or handheld computers are now in common use for all forms of highway inspection and survey. It is strongly advised that UKPMS CVI, FNS and DVI surveys are carried out using an appropriate DCD system. There are various suppliers of software for undertaking UKPMS visual surveys and for a list of suppliers who have an accredited version please visit www.pcis.org.uk for the latest information.

The benefits of using DCDs include improved productivity, on-site help messages and online data validation. Data is also output in the standard UKPMS HMDIF file format for direct loading to a UKPMS system.

This Chapter provides information about the format and objectives of the DCD accreditation test.

2 DCD Accreditation

The aim of DCD accreditation is to ensure that DCD systems enable UKPMS data to be collected in a consistent way. Survey data gathered through UKPMS are used in performance reporting, benchmarking and asset valuation. Therefore it is important that the data collection software, provided by different suppliers, give consistent and reliable results. It is important to note that DCD accreditation tests the data collection software and not the data collection process, which is part of the UKPMS Visual Survey Accreditation Scheme.

The DCD accreditation test is witnessed by a PCIS Support Contractor representative. It is a live test and unlike previous tests no test data package is issued.

Test data, in the form of a list of defects with chainages and quantities, will be supplied by the PCIS representative on the day of the test. DCD suppliers are expected to input the test data in front of the PCIS representative and submit the appropriate outputs on completion of the tests.

The specific aspects to be tested are determined by the agreed test objectives and these are targeted at the most important parts of UKPMS data collection, and include ALL the types of defects listed within the UKPMS User Manual. The test objectives do not necessarily provide a complete list of the requirements for data collection; the complete requirements are given in the UKPMS User Manual.

The DCD accreditation test is open to anyone who supplies data collection systems for UKPMS. This includes not just commercial organisations, but also authorities who collect the data using systems developed 'in house'. The DCD supplier is required to test each current commercial version of their software and any pre-

existing versions still in use. If a DCD supplier issues a new version of their data collection software, then they are required to request a new test using the current version of the DCD accreditation. Exceptionally if the change is small and can be shown to have no impact on the test results, then the DCD supplier may apply to extend their existing accreditation to the new version.

The DCD accreditation test may be revised periodically (for example, to reflect changes to the UKPMS User Manual). The most recent major change is the inclusion of the new Footway Network Survey (FNS). The Roads Board agree the new principles and objectives associated with changes which are then reflected in the test package itself. Currently accredited DCD suppliers will be informed whenever the requirements are revised, and will be advised whether re-testing or self certification testing is necessary, depending on the revised requirements.

3 The Accreditation Procedure

The PCIS Support Contractor is currently responsible for the administration of the DCD software accreditation. Full details of the accreditation procedure are available in the document *'DCD Accreditation – Outline of Test Procedure'* available to download from the PCIS website, www.pcis.org.uk.

There are a number of possible valid approaches to UKPMS data collection systems, and the DCD software accreditation test aims to be flexible enough to provide a meaningful test for each of these. To facilitate this, each DCD supplier is expected to provide background information about their system and, depending on this, the accreditation may be qualified (for instance, limited to use with a specific UKPMS system).

4 Certification

The test outputs will be checked against reference output data produced by the PCIS Support Contractor. The exact requirements for accreditation will be established during the pre-test dialogue with the PCIS Support Contractor. The DCD software will be required to collect all the data precisely.

A certificate will be issued for each DCD software version that has been accredited and information on which versions of the software have passed and any qualifications will be posted on the PCIS website.



5 DCD Accreditation Objectives – CVI Data Collection

The objectives are presented in a hierarchical fashion, with a top-level objective followed by more detailed objectives which addresses additional requirements related to the top-level objective.

Data will be collected for all features CW, FW, KB, CT, VG

(Note, although UKPMS classifies longitudinal and transverse joints as features, this is just for inventory purposes. Concrete defects are collected using the CW feature).

Data to be collected for the following pavement types:

- CW (Carriageway)
 - BTCC – bituminous surface, unknown construction.
 - BP – block paved.
 - CU – concrete surface, unknown construction.
- FW, CT, VG (Footway, Cycle Track and Verge).
 - BP – block paved.
 - BT – bituminous.
 - FG – flagged.
 - CR – concrete.
- KERB – kerb.

Data should be collected for both full and minimal XSPs including:

- Different XSP levels for on and off carriageway.
- Some temporary lanes using minimal XSPs (to be handled as a widened carriageway).
- Some temporary lanes using full XSPs.

Defects for each type of parameter will be included, that is:

- Length defects.
- Lane length defects.
- Count defects.
- Area defects.
 - Check that the ‘to the nearest’ rule is used for the approximation of quarter/half/three-quarter/full.
 - Check that the ‘Single’ lateral extent is used when appropriate.

Check that edge defects are handled correctly.

- Check that if the defect is within a 0.5m strip and extends as far as the edge then it is booked as an edge defect. It is not booked as a whole carriageway defect in this case.
- Check that if the defect extends to the edge of the carriageway, and beyond 0.5m from the edge then the entire area of defect is booked as a whole



carriageway defect, and the area within the 0.5m strip is booked as an edge defect.

- Check that if the defect lies within a 0.5m strip, but does not extend to the edge of the carriageway then it is booked as a whole carriageway defect only (i.e. not as an edge defect).
- Check that edge can be booked in any full XSP valid for CW.

Check that multiple defects can be entered.

- Ensure that different defects can be entered for the same XSP at the same chainage.

Check “not assessed” is entered where appropriate.

Check survey, and section-within-survey parameters are entered correctly.

- Check measured length is entered correctly.

Check that reverse surveys can be handled correctly.

Check that conversion takes place at an appropriate stage i.e. one of the following:

- On the DCD.
- On downloading from the DCD.
- Using a utility.
- As part of a specified UKPMS system. If this option is used, the DCD software will only be accredited for use in conjunction with this system.

Check the conversion calculation for each type of defect, and corresponding to each extent code:

- Length.
 - Ignore.
 - Local.
 - Partial.
 - General.
- Lane length.
 - Ignore.
 - Local.
 - Partial.
 - General.
- Count.
 - Ignore.
 - Local.
 - Partial.
 - General.
- Area.
 - Ignore.
 - Local.
 - Partial.
 - General.



If the 20m lengths for each defect arising from the conversion have the same extents then it is possible to combine the lengths into longer subsections. It is not compulsory to do this, but because it is advisable (to reduce the amount of data to be stored) the tests will include advice to this effect.

Check that the conversion process handles the end of a section appropriately, as the majority of the final subsections will be less than 20m.

6 DCD Accreditation Objectives - DVI data collection

The objectives are presented in a hierarchical fashion, with a top-level objective followed by more detailed objectives which address additional requirements related to the top-level objective.

Data to be collected for all features CW, FW, KB, CT, VG.

Note, although UKPMS classifies longitudinal and transverse joints as features, this is just for inventory purposes.

Concrete defects are collected using the CW feature, and then rated using joints.

Data to be collected for all pavement types.

- CW (Carriageway).
 - BTCC – bituminous surface, unknown construction.
 - BP – block paved.
 - CU – concrete surface, unknown construction.
- FW, CT, VG (Footway, Cycle Track and Verge).
 - BP – block paved.
 - BT – bituminous.
 - FG – flagged.
 - CR – concrete.
- KERB – kerb.

Data should be collected for both full and minimal XSPs

including:

- Different XSP levels for on and off carriageway.
- Some temporary lanes using minimal XSPs (to be handled as a widened carriageway).
- Some temporary lanes using full XSPs.

Defects for each type of parameter will be included,

that is:

- Length defects.
- Count defects.
- Area defects.



- Depth defects.
- Defects with two parameters: e.g.
 - Length, Severity.
 - Direction, Percentage affected.
 - Length, Number of lanes.

DVI subsection.

- Check that the final subsection can be handled.
- Check that 20m subsection length, and one other subsection length (say 50m) can be handled.
- Check that variable concrete bay length can be handled.

Check that edge defects are handled correctly.

- Check that if the defect is within a 0.5m strip and extends as far as the edge then it is booked as an edge defect. It is not booked as a whole carriageway defect in this case.
- Check that if the defect extends to the edge of the carriageway, and beyond 0.5m from the edge then the entire area of defect is booked as a whole carriageway defect, and the area within the 0.5m strip is booked as an edge defect.
- Check that if the defect lies within a 0.5m strip, but does not extend to the edge of the carriageway then it is booked as a whole carriageway defect only (i.e. not as an edge defect).
- Check that edge can be booked in any full XSP valid for CW.

Check that multiple defects can be entered.

Ensure that different defects can be entered for the same XSP at the same chainage.

Check “not assessed” is entered where appropriate.

Check survey, and section-within-survey parameters are entered correctly.

Check measured length is entered correctly.

Check that reverse surveys can be handled correctly.



7 DCD Accreditation Objectives - HMDIF format and file contents

The detail of how this objective is handled in each individual case depends on the pre-test dialogue between the DCD supplier and the PCIS Support Contractor. Evidence will be required that the DCD system can be used to collect both CVI and DVI data to the required standard, but the presentation of the outputs will vary depending on factors such as whether the DCD is linked to a specific UKPMS system.

Check HMDIF format.

This will not be required if the DCD system is only used as part of a UKPMS system which does not require HMDIFs.

- Check that the template is correct.
- Check that line counts are correct.
- Check that the correct record IDs are used.
- Check that the structure of records is correct.
- Check that the records are in the correct order.

Check the file contents for collected data.

CVI data, as collected, will only be checked if the conversion mechanism used by the DCD supplier permits the output of CVI data prior to conversion. Collected data for DVI will always be checked.

- Check survey and section-within-survey parameters are given correctly
- Check defect data is given correctly
- Check that the correct rule set has been used. This will not be an exhaustive check, and so if the rule set has been entered into the DCD using a manual process, the resulting errors may not be trapped.

Check file contents for converted CVI data.

- Check survey and section-within-survey parameters are given correctly.
- Check defect data is given correctly.

8 Issues not included in the current DCD Accreditation

DCD accreditation does not certify that data is collected to UKPMS standards – it merely tests that the software enables data to be collected to UKPMS standards. Other issues such as inspector training and other operational issues have an impact on the data collected, and these lie outside the scope of the DCD accreditation scheme. The test only verifies the capability of the software used, and is not a guarantee of the procedures and approach used in the field.

DCD accreditation does not test that when the same defect has a gap of less than 2m, the gap is ignored.

Defect identification

- By inspectors on foot.
- By inspectors in a vehicle.
- By inspectors working from video.

Pavement type identification

- By inspectors on foot.
- By inspectors in a vehicle.
- By inspectors working from video.

Defect measurement

- Using a measuring wheel.
- By eye from a vehicle.
- Taken from a video.

Chainage measurement

- Using a measuring wheel.
- Using a trip meter.
- Using chainages taken from video.

When sections are linked together to form routes, the chainage might be entered for the route as a whole, with software being used to convert this overall chainage to a chainage within the section. We will not test this eventuality, and so cannot check that the software calculates the chainage information correctly for each section.

An understanding of section definitions and conventions

(e.g. roundabouts measured clockwise, each side of a dual carriageway to be considered as a separate section).

An understanding of XSP conventions and identification

(although we will test that typical XSP codes can be input, and that the correct codes are used when lanes are indicated on a diagram).

Master and partial surveys.

Conversion of CVI data to DVI data to form a pseudo-CVI survey.

Note that HMDIF formats will not be checked if the data collected is linked to a specified UKPMS system which will accept the data in a different format. In this case, the DCD software will only be accredited for use with this UKPMS system.

Inventory Data Collection.

The tests do not check that invalid data cannot be entered, but simply that valid data can be entered and correct output files produced.