

# UK Pavement Management System



## Technical Note 40

*Rules for Post-processing CVI Surveys for Loading to UKPMS*

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## Document Information

<b>Title (Sub Title)</b>	Technical Note 40 Rules for Post-processing CVI Surveys for Loading to UKPMS
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<b>Description</b>	An explanation of how to convert CVI data (as collected) to 'Local', 'Partial' or 'General' extent codes for loading to UKPMS.

## Document History

<b>Version No</b>	<b>Status</b>	<b>Author</b>	<b>Date</b>	<b>Changes from Previous Version</b>
1.01	Draft	RAC	20/07/06	1 <sup>st</sup> draft – based on Appendix 1 (version 1.0.3) of the UKPMS Visual Survey Manual July 2001.

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## Introduction

The CVI survey procedure (as described in the *UKPMS User Manual Volume 2, Chapter 5*) is designed to enable defects to be recorded using an approach which is practical for data collection from a vehicle. Prior to loading this information into UKPMS the CVI data, as collected, must be converted to the standard UKPMS extent codes (Local, Partial, General).

This Technical Note describes the rules for this conversion process.

## Overview

The conversion process is based upon creating 20m lengths<sup>1</sup> over which the length/area of the defect is considered. Depending on the quantity of the defect within the 20m length, the defect is assigned an extent code of:

- **Local:** Between 5% and 20% (inclusive) affected
- **Partial:** Over 20% affected and up to and including 40%
- **General:** Over 40% affected

There are a number of possibilities for carrying out the conversion of the CVI data. Each of these is acceptable, provided that it can be shown to conform to the standard conversion rules.

1. Processing can take place on the DCD
2. Processing can take place on downloading from the DCD
3. A utility can be provided by the DCD supplier to carry out the conversion using the rules documented below.
4. It could be provided as part of the initial processing steps of the UKPMS Automatic Pass, as an optional addition to an accredited UKPMS system.

CVI defects fall into four broad types:

- **Length Defects** – Edge Defects, Kerb Defects, Off-Carriageway Defects, Longitudinal Joint Defectiveness, Longitudinal Joint Defective Seal
- **Lane Length Defects** – Carriageway Wheel Track Cracking, CVI Rutting
- **Count Defects** – Transverse/Reflection Cracking, Transverse Joint Defectiveness, Transverse Defective Seal
- **Area Defects** – All other defects

Each of these types of defect is converted to provide extent codes in a slightly different way, as described in the next section.

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<sup>1</sup> 20m is chosen for compatibility with the DVI survey which as default uses 20m aggregation lengths.



## Processing Rules

The process for converting the raw defects is first to divide the section up into 20m sub-sections (except at the end of the section where a shorter sub-section may be produced). The quantity of the defect within the sub-section is then expressed as a percentage using the conversion given in the table below:

<b><i>Defect Type</i></b>	<b><i>Attributes</i></b>	<b><i>Conversion to percentage</i></b>
Length Defects	Start Chainage End Chainage XSP	The total length of the defect within the sub-section expressed as a percentage of the sub-section length. Total Length = $\Sigma(\text{End Chainage} - \text{Start Chainage})$ for that part of the defect lying within the sub-section.
Lane Length Defects	Start Chainage End Chainage XSP No. of lanes affected	The total lane length of the defect within the sub-section expressed as a percentage of the sub-section lane length. Total Lane Length = $\Sigma((\text{End Chainage} - \text{Start Chainage}) \times \text{No. of lanes affected})$ for that part of the defect lying within the sub-section. Sub-section Lane Length = Sub-section Length $\times$ No. of Lanes Note that the number of lanes must be recorded at the start of the section for surveys using Minimal XSP codes. For surveys using Full XSP codes the number of lanes is not required, since this will always be 1 for each XSP.
Count Defects	Chainage XSP	The total number of the defect within the sub-section, multiplied by 5 and expressed as a percentage of the sub-section length. This assumes a minimum spacing of 5 metres.
Area Defects	Start Chainage End Chainage XSP Lateral Extent	The total area of the defect within the sub-section expressed as a percentage of the sub-section area. Total Area = $\Sigma((\text{End Chainage} - \text{Start Chainage}) \times \text{Lateral Extent})$ for that part of the defect lying within the sub-section. Sub-section Area = Sub-section Length $\times$ 1 (since the Lateral Extent is the proportion of the width affected, rather than an absolute width). Note that the 'Single' lateral extent is assumed to be 1/8 for this calculation.

The percentage obtained is converted to an extent using the following rules:

- <5%: Ignore – no length of defect created
- $\geq 5\%$  and  $\leq 20\%$ : Local
- $> 20\%$  and  $\leq 40\%$ : Partial
- $> 40\%$ : General

Note that it is permissible to combine lengths of a defect into a longer length when the constituent 20m lengths all have the same extents.