

## ***Interactive comment on “Soil geohazard mapping for improved asset management of UK local roads” by O. G. Pritchard et al.***

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Firstly, the authors thank the reviewer both for their time in reviewing our manuscript and for their constructive comments.

We have approached each of the points raised (RC - Reviewer comment, AC - Author Comment):

RC1: If there is one major criticism, it that the authors have assumed that the damage to the road network was due to shrinkage under dry conditions but as damage could also be caused by swelling of the clays on re-wetting

AC1: To clarify, although we only refer to damage being caused by the shrinkage of clay

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soil, the geohazard models presented incorporate the potential for a soil to both 'shrink' and 'swell'. However, if this is not clear in the manuscript, the text can be amended to add clarity accordingly.

RC2: It would be useful to see the PSMD values for the period under examination (2007-2014).

AC2: PSMD data for the time period indicated was not available for the study area for this piece of analysis. Instead, the geohazard model uses historical, empirical long-term average of PSMD data as made available to the researchers. We have considered the incorporation of in-situ and realtime monitoring of soil moisture using instrumentation and remote sensing data. A short addendum to the Section 6, 'Discussion and conclusions' could be made to reflect this.

RC3: While I appreciate that you can only work with the data you have, the fact that the assessment of damage is not undertaken for the same road section in successive years, could lead to bias in the data. Can the authors show that the CVI assessments of the road network are undertaken in such a way that even though the same section may or may not be evaluated in successive years, there is no bias by CVI assessments being made where damage is suspected and that the rolling programme is sufficiently 'random' that an unbiased sample is obtained?

AC3: The CVI data provided by Lincolnshire County Council did dictate the nature of the analysis undertaken. However, potential bias in the CVI data has been considered and minimised by the sampling protocol undertaken by Lincolnshire County Council's highway assessors. This is achieved by splitting the Lincolnshire unclassified road network into 10 sub-regional areas where a percentage of each area is surveyed each year to ensure there is no geographical bias in the data. Furthermore, the same 2-man CVI surveying team have been used for a number of years. They are not involved in scheme selection and/or maintenance programmes, thus they are not influenced by maintenance or budgetary requirements and so this therefore removes another possi-

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ble element of bias. An explanation can be inserted into the paper Section 3.2 'Highway Condition Data' to explain this.

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