

Research Need for Pavements and Materials Technical Advisory Group

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1. Issue Identified:

Condition Rating Survey Distress Parameters and Calculation Models

2. Summary of Problem:

IDOT has been using its Condition Rating Survey to evaluate the condition of pavements since 1974. The CRS is a numerical index between 1 (worst) and 9 (best). The models to calculate CRS values are primarily a function of roughness, rutting, faulting, and up to five recorded distresses. Some distress types have five levels of severity and extent, while some have only three or four levels. Current distress definitions may result in inadequately representing some distresses in the CRS value. In addition, true extent and severity of a distress may be misunderstood. The first phase of this research seeks to define five levels of extent and severity for all distresses: low severity and extent, infrequent moderate severity, frequent moderate severity, infrequent high severity and frequent high severity. The research should define frequent versus infrequent for each distress. The second phase involves recreating the CRS calculation models based on the new distress levels. The research should also look at including all known distresses on a pavement section in the CRS calculation, not just the five predominant distresses.

This section provides background on CRS calculation modeling. ERES Consultants Inc., (1995) detailed the initial development of formulas to calculate CRS from international roughness index, rutting, and faulting based on vehicle-collected data and five predominant distresses identified by individuals viewing the pavement. In 2007, Laura Heckel of Heckel Engineering and Yanfeng Ouyang of the University of Illinois Urbana Champaign updated the CRS calculation models. In 2018, the CRS calculation models were updated again to reflect all distresses. IDOT will provide its current CRS manual and CRS distress guide upon request. For examples of other distress schemes, the Strategic Highway Research Program's Long-Term Pavement Performance project's [Distress Identification Manual](#) records severity and extent for all distresses.

3. Desired Results/Outcomes:

IDOT will implement the new CRS distress parameters and CRS calculation models into its CRS process as soon as the research concludes. By including all known distresses at accurate extent and severity levels, life cycle costs of each pavement section may be reduced. Approximately 75% of each program is spent on maintaining IDOT's existing pavements and bridges and more than half of that is spent on pavements. Correct identification of distresses and calculating conditions will effectively assist the pavement asset management. An accurate depiction of all distresses and their severities will aid IDOT in developing treatments for each pavement section throughout its life cycle. More accurate CRS calculation models will give a better idea of the condition of the whole network.