

REVIEW OF PCR METHODOLOGY

FHWA/OH-99/001

EXECUTIVE SUMMARY

This study was conducted to review the Pavement Condition Rating (PCR) methodology currently used by the Ohio DOT. The results of the literature search in this connection indicated that many Highway agencies use a similar methodology to rate their pavements. However, due to the linear nature of the current PCR model, it is deficient in certain respects.

An analysis of the PCR data, which was collected by the ODOT in the past 11 years (1985-95), indicated that there were some distresses among each type of pavement (currently there are four types of pavements: Flexible, Composite, Jointed Concrete and Continuously Reinforced Concrete or CRCP) which were rarely observed in the past. The reasons for such occurrences and the use of this information to enhance the current system are discussed in the report.

A statistical method known as: Classification Tree, was used to analyze the available PCR and maintenance actions data for the purpose of (1) Rating the pavements, and (2) assigning a maintenance and/or rehabilitation (M&R) action when distresses of the pavement are known. The results of this analysis indicated that due to non-linear nature of pavement rating, this model was able to assess the pavement condition better than the current linear model of estimating the PCR.

An expert opinion survey was designed and conducted to collect data on the pavement ratings and recommended M&R actions. Several pavements of each pavement type were included in this survey. A combination of "Classification Tree" and "Proportional Odds Model" was used to analyze the data and develop new weights for the pavement distresses of each type of pavement. The PCR values of individual pavement sections, an entire route as well as the entire roadway network were calculated from new and old distress weights and the results were compared. These comparisons indicated that the Pavement Condition Ratings obtained from the new weights were able to delineate certain pavement conditions better than the old weights and the pavement Ratings were not dependent upon the type of pavement when new distress weights were used.

Statistical analysis of the PCR data collected by the ODOT for the year 1996 was performed to determine a suitable sample size which can be used to survey the NHS network for collecting the PCR data of the network for Pavement Management purposes and selecting the pavements for inclusion in the annual M&R program of the ODOT. If the recommended procedure is implemented, it can save some time in the annual PCR data collection.

The report contains recommendations for: (1) revising the list of distresses of each pavement type, (2) developing a non-linear model to assess the pavement condition Rating and M&R needs of any given pavement, (3) a suitable sampling procedure to survey the network, and (4) revising the definitions of some distresses of each pavement type.