

Hodge

**COMPUTERIZED METHOD OF PROJECTING
REHABILITATION AND MAINTENANCE
REQUIREMENTS DUE TO VEHICLE
LOADINGS**

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**STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION**



CENTER FOR TRANSPORTATION RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN



TEXAS TRANSPORTATION INSTITUTE
THE TEXAS A&M UNIVERSITY SYSTEM

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Computerized Method of Projecting Rehabilitation and Maintenance Requirements Due to Vehicle Loadings

by

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The goal of the research summarized here was to revise and combine the REHAB and NULOAD computer models into a new approach to forecast pavement rehabilitation costs. The new approach is called RENU and it incorporates the following three main elements: (a) revised pavement performance equations, (b) design-oriented survivors curves, and (c) a procedure to predict the increment in axle loads when higher pay loads are allowed. The most relevant contribution of the new model in the area of flexible pavements is the development of a serviceability/distress approach to investigate the effect of vehicle loading on the life cycle of highways. This approach has the capability to predict if a pavement needs light to medium rehabilitation as a result of distress signs, when the riding condition (PSI) has not yet reached a terminal value. The new approach is considered more reliable, for Texas flexible pavements, than the AASHTO methodology. In the area of rigid pavements the two most important improvements are the formulation of a modified AASHTO equation to include soil support values, regional factors, design characteristics, and traffic conditions typical of the Texas highway system, and the development of a failure prediction model to estimate maintenance needs.

The RENU approach was built using experimental values of material properties, climatic conditions, design factors, and traffic measurements obtained by the Texas Transportation Institute (TTI), and the Center for Transportation Research (CTR).

Briefly, the overall methodology can be summarized in four steps: (a) a load distribution procedure is incorporated to investigate the shift toward higher loads if a new legal axle load limit is considered, (b) generation of pavement performance functions

based upon statistical criteria, (c) generation of survivor curves to predict the extent of road rehabilitation requirements in each of the periods of a planning horizon, and (d) determination of rehabilitation costs considering life cycles for both the current and new axle load legal limits.

The published version of this report may be obtained by addressing your request as follows:

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