

OHIO DEPARTMENT OF TRANSPORTATION
QUARTERLY RESEARCH REPORT

For Quarter Ending December 31, 2002
Date Submitted: February 21, 2003

Project: Truck/Pavement/Economic Modeling and In-Situ Field Test Data Analysis Applications

Research Agency: Ohio University

Principal Investigator(s): Dr. Shad Sargand and William Edwards

Pooled Fund Project No: SPR-2(203)

State Job No.: 14770(0)

Contract No.: 10212

Project Start Date: February 9, 2001 Contract Funds Approved: \$394,299

Project Completion Date: February 9, 2005 Spent To Date: \$236,841

60 % Funds Expended 50 % Work Done 50 % Time Expired

List the Technical Liaisons and other individuals who should receive copies of this report: Roger Green

SUMMARY OF PROGRESS FOR QUARTER:

Task A1 - Drainage

Available data in Ohio and North Carolina (distress data, FWD, load response, and performance) were analyzed to help develop a guideline for selection of proper base for PCC and AC. The criteria used for selection were based on:

- A. Permeability
- B. Stiffness
- C. Constructability

The review of LTPP data for similar analyses is started.

Task A2 – PCC Pavements

Analysis of the data from the APLF, I-490 in Rochester, New York, and Routes 2 and 50 were reviewed and processed. The data will help in establishing the joint spacing of rigid pavement.

Hardware and software were developed and calibrated for data collection. This system will be used in the next series of testing at I-490 in Rochester, New York.

The state responses from the questionnaire have been summarized.

Task A3 – Subgrade and Base Compaction

Questionnaires were developed to determine current practices regarding the construction of base and subgrade layers, and to determine which states monitored the stiffness of individual pavement layers in SHRP SPS-1 and SPS-2 experiments with nondestructive testing. Of the fifty questionnaires sent out, sixteen were returned for base and subgrade construction and a couple of states indicated nondestructive testing had been performed during construction of SPS sections. These responses have been summarized for review.

To provide more comprehensive NDT data for examining subgrade compaction, LTPP was contacted to obtain all available NDT data on the SPS-1 and SPS-2 experiments. At that time, they were only able to furnish data passing Level E criteria. During the January 2003 TRB meeting, LTPP personnel indicated that all NDT data would be made available. Five CDs were received on February 18, 2003.

All NDT data in the LTPP database were classified for test sections SPS-1, SPS-2, SPS-8 and SPS-9. An interface program was developed using C++ to extract necessary data from the LTPP database and automatically generate input format for backcalculation programs. Once all input data were created, backcalculation analyses using a batch mode made it possible to handle massive quantities of NDT data with both linear and nonlinear approaches.

Task E1a – Process Data

Seventy-five percent of the database has been developed.

Task G2d – FEM Models

Four test sections of SPS-2 (4TSPS2) were selected for calibration of mathematical models for rigid pavement. Results of the models were compared with field data.

PROPOSED WORK FOR NEW QUARTER:

Task A2 – PCC Pavements

Use the 3-Dimensional Finite Element Model, field data, and data from the APLF to determine the optimal joint spacing for PCC.

Task A3 – Subgrade and Base Compaction

Continue to analyze LTPP data and develop a rational criterion for base selection and stiffness of subgrade. Perform non-linear analysis of NDT data from subgrade and base layers using MODCOMP.

Task E1a – Process Data

Continue the data analysis and development of the database.

Task G2d – FEM Models

Analyze the four selected SPS-2 test sections (4TSPS2) using J-slab software.

IMPLEMENTATION:

None.

PROBLEMS (if any):

More time is required to obtain LTPP data than was originally anticipated.

EQUIPMENT PURCHASED (if any):

None.