

**State Planning and Research Program
Quarterly Report**

PROJECT TITLE: The Effects of Implements of Husbandry on Pavement Performance TPF (148)

OBJECTIVES: 1. Determine pavement responses to selected farm equipment.
2. Compare pavement damage/response to typical 5-axle semi.

PERIOD COVERED: October, 2007- December, 2007

PARTICIPATING AGENCIES: MnDOT, Minnesota Local Road Research Board, Iowa DOT, Illinois DOT, Professional Nutrient Applicators Association of Wisconsin.

PROJECT MANAGER: Dr. Shongtao Dai

LEAD AGENCY: Mn/DOT

PRINCIPAL INVESTIGATOR: Lev Khazanovich.

SP&R PROJECT NO:

TPF-148

PROJECT IS:

Planning
 Research &
Development

ANNUAL BUDGET:

\$430,000 for 3 years

PROJECT EXPENDITURES TO DATE:

The final contract with the PI just got approved.
About \$158,300 was spent on the construction of the test sections.

WORK COMPLETED:

1. The detailed instrumentation plan was prepared by the research team and executed by MnROAD staff. The research team began work on the detailed data collection plan. Several conference calls with representatives from the manure hauler industry, equipment manufactures, and tire manufactures were conducted and valuable inputs were obtained. The following issues were discussed: types of vehicles and tires to be used in field testing, a possibility of obtaining tire contact pressure testing information from the tire manufactures, logistics of the material support (drivers, equipment, etc.) by the industry during the field testing, etc.
2. The 3D LVDT systems for displacement measurements in the base layer were manufactured and installed along with other instrumentation.
3. A trial test was conducted on December 19. A tractor made several laps on the test track. Some sensor response data under the tractor were recorded. Valuable inputs from the industry representatives were obtained. For example, a concern was raised about an ability of some types of farm equipment to achieve a necessary acceleration on the short MnROAD farm loop track before they reach the instrumented portion of the first section. To ensure consistency between various equipments, a decision to limit the test speed to 10 miles per hour was made.
4. The research team initiated the work on the detailed test plan for each day of the Spring 2008 field testing. The plan addresses the types of vehicles to be tested, tire pressure, vehicle weight, vehicle speed, and other parameters. The plan will also address the sequence of the FWD testing and distress surveys.
5. The contract with the U of M is officially approved. The subcontract with Iowa State University is still waiting for approval.

SUMMARY OF ACTIVITIES EXPECTED TO BE PERFORMED NEXT QUARTER:

1. The research team will complete the data collection plan.
2. The research team will also initiate development of the database for the data collected in this study.

STATUS AND COMPLETION DATE:

The project is on schedule. The completion date: Spring, 2010.