



SPR Quarterly Progress Report
October 1, 2006 through December 31, 2006

Date January 17, 2007

TO: Technical Advisory Committee Members:
Cole Mullis, Oregon Department of Transportation
Larry Ilg, Oregon Department of Transportation
Don Crownover, Oregon Department of Transportation
Elizabeth Hunt, Oregon Department of Transportation
Jim Huddleston, Asphalt Paving Association of Oregon
Anthony Boesen, Federal Highway Administration

FROM: Norris Shippen, Research Coordinator (ph: (503) 986-3538)

1. Project

Mechanistic Pavement Design Input Parameters
SPR-642

2. Key Dates

Start Date for ODOT: October 2005
Completion Date for ODOT: June 2007

3. Principal Investigator

Todd V. Scholz, Ph.D., P.E.
Department of Civil, Construction, and Environmental Engineering
Oregon State University
Corvallis, Oregon 97331-2302

4. Progress

- Task 1 (Backcalculation Software) – In researching the new AASHTO design guide software, it was determined that the software uses a program called JULEA developed by Jacob Uzan. Efforts to obtain a copy of the software were made, but were unsuccessful.
- Task 3 (Material Characterization) – A meeting with ODOT personnel (Rene Renteria, Brian Sullivan, and John Coplantz) was held in Salem late last year to discuss the aggregate sources and subgrade soils to sample for the purposes of conducting resilient modulus testing as well as index property testing. John supplied us with the most recent pavement condition data for the entire state. The database was queried to determine the location of the sampling locations for subgrade soils. We are currently still in the process of determining the most suitable sites for pavement coring and subgrade soil sampling. Also, we have had the MTS Load Frame testing equipment serviced and are currently in the process of final preparations to begin dynamic modulus evaluation. Final preparations includes the following:

- purchasing the new MTS controller (which has been ordered and is currently being manufactured)
 - calibration of the LVDT's and Load Cell to be used in the testing of the specimens
 - implementation of the correct data collection sequence to be used (based on the provisional AASHTO test protocol)
 - final instrument and equipment set-up
 - practice runs for dynamic modulus testing on specimens with known property characteristics
- Task 4 (Evaluation of Transfer Functions and Failure Criteria) – The pavement condition database provided by John Coplantz was queried for the best and worst pavements across the state for the purposes of comparing pavement performance with design guide transfer function predictions, assuming that design data can be obtained for the pavement sections identified.
 - Task 5 (M-E Pavement Design Validation) – In order to precisely locate the placement of the tires in relation to the strain gauges, axle sensors were purchased from IRD, Inc. We attempted to install the sensors at the I-5 strain gauge location; however, weather conditions at the time did not permit the dry conditions needed for the epoxy to cure. Therefore, the sensor installation has been put on hold until conditions improve. However, the night was not a complete loss. We were able to collect FWD data as well as cores from the pavement surrounding the gauges. Norris Shippen, Eric Brooks, and Todd Scholz collected WIM and strain gauge data on December 20, 2006. Photos of the lateral position of the trucks for which data was collected were also obtained.

5. **Problems**

- The strain gauge data acquisition system was recalled for replacement of the cooling fans. The fans were replaced; however, the company also recalibrated the machine, which meant all of our calibration factors were no longer valid. Therefore, an attempt to collect strain gauge data during November was futile. We have rectified the problem and the data acquisition unit is now in full working order. Also, the software provided by the data acquisition unit manufacturer has been difficult to use in that it is not at all intuitive and the instruction manual does not provide detailed guidance.
- As was mentioned in the earlier section, the sensor installation was postponed to a later date due to the weather and pavement conditions that are required for proper installation.

6. **Work Planned for Next Quarter**

- Task 3 – Provide subgrade soil sampling locations to Pavement Services.
- Task 4 – Obtain JULEA for evaluation purposes and continue assessing the backcalculation software programs. Finalize the paper on transfer functions used by AASHTO 2002 Design Guide and continue evaluation of the software.
- Task 5 – Install the piezoelectric strips at the I-5 location (weather permitting) and continue to collect strain data, WIM data, and transverse position data.
- Re-work budget for the project to reflect changes in the work plan as well as a no-cost extension of the project through January 2008.

7. **Finances**

SPR Project Summary

VENDOR	FY'06	FY'07	FY'08	TOTALS
ORIGINAL BUDGET				\$ -
REVISED BUDGET	\$ 41,544	\$ 49,667	\$ 33,777	\$ 124,988
EXPENDITURES - VENDOR	\$ 41,544	\$ 33,789	\$ -	\$ 75,333
BALANCE	\$ -	\$ 15,878	\$ 33,777	\$ 49,655
ODOT	FY'06	FY'07	FY'08	TOTALS
ORIGINAL BUDGET	\$ 40,000	\$ 80,000	\$ 40,000	\$ 160,000
REVISED BUDGET	\$ 9,023	\$ 30,000	\$ 4,000	\$ 43,023
EXPENDITURES - ODOT	\$ 9,023	\$ 9,652	\$ -	\$ 18,675
BALANCE	\$ -	\$ 20,348	\$ 4,000	\$ 24,348
PROJECT	FY'06	FY'07	FY'08	TOTALS
ORIGINAL BUDGET	\$ 40,000	\$ 80,000	\$ 40,000	\$ 160,000
REVISED BUDGET	\$ 50,567	\$ 79,667	\$ 37,777	\$ 168,011
EXPENDITURES - PROJECT	\$ 50,567	\$ 43,441	\$ -	\$ 94,008
BALANCE	\$ -	\$ 36,226	\$ 37,777	\$ 74,003