

**Demonstration and Purchase of  
PG Binder Testing Equipment**

**Phase 1**

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Research and Materials

Prepared by  
James Mahoney  
Connecticut Advanced Pavement Lab  
Connecticut Transportation Institute  
University of Connecticut

## **Background:**

To help expedite the implementation of the Superpave methods in the mid-1990's, the Federal Highway Administration (FHWA) conducted a Pooled Fund project that allowed state transportation agencies to purchase shares in this Pooled Fund. Each share provided the state transportation agency with one full set of Superpave test equipment – both for the asphalt binder and the HMA. This pooling of funds for the purchase of this new and expensive test equipment gave the states greater purchasing power that resulted in a reduction of cost as compared to the states purchasing the equipment individually.

The majority of the equipment that was purchased under the Pooled Fund was for testing of asphalt binder in accordance with the Performance Grading (PG) system. The binder testing equipment is highly sophisticated and contains sensitive electronics for making the necessary measurements. As most of this equipment has been in service for approximately 15 years, it is beginning to reach the end of its service life and manufacturers are no longer carrying repair parts.

With the advent of new test methods such as the Multiple Stress Creep Recovery Test, older DSR equipment is either not able to run this tests or the results are suspect because of the limitations of the older equipment. Replacing this equipment is paramount for the states to adopt these new methods.

## **Problem Statement:**

The PG binder testing equipment that was purchased as part of the original pooled fund study is nearing the end of it service-life and needs to be replaced. This replacement is necessary to ensure transportation agencies can rely on the equipment and test results from said equipment for ensuring the quality of the materials they are purchasing. New equipment will allow the states to evaluate and adopt new testing methodologies that their current equipment is not able to run.

## **Objective:**

The objective of Phase 1 of this project is to establish a Pooled Fund project similar to the one conducted by FHWA, here in the northeastern part of the country for the purposes of first demonstrating and then purchasing new binder testing equipment. Phase 1 of this project will be used to cover the expenses associated with organization of the equipment demonstration, the costs associated with developing the specifications for the equipment purchase and other associated costs such as personnel time required to process the purchase orders. In Phase 2 of this project, each participating state transportation agency

will have the option to commit the additional funds necessary to purchase the equipment they determine to be required.

### **Evaluation Plan:**

The success of this project will be established when the participating states have the new binder testing equipment running in their facilities.

### **Benefits:**

This project has four significant benefits. The first benefit of this project will be an increase in purchasing power, as the equipment will be purchased in volume. This should reduce the overall cost to each participating state and/or allow the purchase of better quality equipment.

The second benefit is that there will be formal demonstrations of the equipment from each of the major manufacturers that the various agency personnel will be able to see in one location at the same time. This will provide the opportunity to compare the equipment side-by-side which would not be practical if each state were to pursue the equipment purchases separately.

The third benefit is that with most states in the region having the same equipment such as a DSR, it should improve reproducibility, aid technicians when they are having problems by being able to work with colleagues and reduce service contract costs as trips can be scheduled to minimize travel. This was observed when all of the New England states had the same DSR after the last Pooled Fund equipment purchase.

The fourth benefit of this project, and probably the biggest benefit of this project, will be that states will be able to run new test methods with their equipment that will allow the states to better characterize the materials they are purchasing. The newer equipment will also have a higher sensitivity which will yield test results with a higher degree of resolution.

### **Research Results:**

The outcome of this research project will be documented in the form of a final report. The final report will summarize the equipment purchases made for each state and the final accounting of the funds spent on the equipment for each participating state.

The research team will prepare the following reports:

- Quarterly Progress Reports
- Draft Final Report
  - o 3 Copies and a Microsoft Word Version and Adobe PDF
- Final Report

- 35 Copies and a Microsoft Word Version and Adobe PDF

### **Implementation:**

The implementation of this work will be the successful procurement of the binder testing equipment.

### **Work Plan:**

**Note: Phase 2 will start before the end of Phase 1 and the two Phases will run concurrently to the completion of this project. All funds for the equipment purchases will come from Phase 2 and all administrative costs for both Phases are included in Phase 1.**

#### **Task 1 – Survey of state’s equipment needs**

The research team will formally poll the participating states as to what types of equipment they would like to purchase as part of this project. This information will be tabulated and redistributed to the participating states. The major manufacturers of the desired types of equipment to be purchased will be identified once the responses from the states have been verified.

Also, the states will be asked to identify any specific requirements they would like to see included such as extended warranties, on-site service, etc. These specific requests/requirements will be circulated among the participating states to determine if there is concurrence with including these items in the equipment requirements. Additional requests/requirements will be conveyed to the equipment manufacturers in advance of the demonstration so they can address them.

#### **Task 2 – Equipment Demonstration and Selection**

An equipment demonstration will be scheduled based upon the equipment identified in Task 1. The demonstration will be conducted in the CAP Lab at the University of Connecticut. The equipment demonstration is anticipated to require two days. The first day will be for the equipment manufacturers to demonstrate their equipment and to make short formal presentations about the merits of their equipment. All of the major manufacturers of the identified equipment in Task 1 will be invited to participate in the demonstration.

The order of the presentations made by the equipment manufacturers will be determined randomly and only state personnel will be allowed to be present for the presentations. Manufacturers will not be allowed to attend the presentations made by their competitors.

The second day will be used by the state personnel to debate and decide which manufacturer's equipment will be purchased. There will be no equipment vendors present for the second day. Each state that plans to purchase the specific piece of equipment will have one vote in the decision. The majority will rule for the selection of the equipment vendor. In the event a state has strong objections to the equipment selected, that state will have the option of not participating in the purchase of that specific piece of equipment. A set of criteria for the selection process will be developed to justify the selection of the equipment – price considerations will be one of the selection criteria along with other equipment appropriate criteria.

After the demonstration, the results of decisions will be circulated amongst the participating states for official verification. This will be particularly important in the event a state is unable to send a representative that can commit to the purchase of the equipment.

States will have the option of contributing additional funds to cover the cost of travel for their personnel attending the demonstration. Travel expenses will be reimbursed by the CAP Lab for states that contribute the additional funds to cover the cost of travel. Travel reimbursements will be based upon the rules of the University of Connecticut which are modeled after the Federal rules for travel. Any unspent funds contributed for travel that are not used will be rolled over to the equipment purchase(s) for that state. States can contact the CAP Lab for assistance with estimating travel expenses. All of the funds contributed to cover travel will need to include the 53% University indirect rate (overhead) that is charged to all direct expenses.

### Task 3 – Development of Purchase Specifications

The CAP Lab will develop purchase specifications with the proper documentation required to justify the specific manufacturers equipment selected by the group of participating states.

### Task 4 – Purchase of Equipment

Utilizing funds states transfer into Phase 2 of this project, the equipment will be purchased and delivered to the participating labs. Equipment setup and training will be performed by the equipment manufacturer as specified. The University of Connecticut will require documentation from each of the participants receiving equipment to release payment to the vendors.

### Task 5 – Final Report

The research team will produce a final report that summarizes the equipment purchased and an accounting of the funds received and expended for this project.

### **Budget and Budget Justification:**

The estimated cost to complete Phase 1 of this project is \$37,673. Table 1 contains a detailed budget for Phase 1. This includes the University of Connecticut's negotiated indirect rate of 53%. The fringe rates are those currently negotiated by the State of Connecticut at the University of Connecticut and published for fiscal years 2010 and 2011. This estimate does not include funds contributed by participating states to cover the travel expenses for their personnel to attend the equipment demonstration and TAC meeting. Additional funds contributed by states for travel must include the University's indirect-cost additive, which is 53 percent.

The salaries requested for this project will be used to conduct the work outlined in the work plan. This will include conducting a survey of the states for their equipment needs, organizing and conducting the equipment demonstration and TAC meeting, as well as personnel time to develop the purchase specifications and actually purchase the equipment. The contractual line item in the budget is for catering the equipment demonstration. The supplies will be used to make the temporary utility connections to the CAP Lab utilities required to facilitate the equipment demonstration.

### **Project Duration:**

It is anticipated that this project will require 15 months to complete – assuming an April 1<sup>st</sup> start date. Figure 1 has a bar chart that details the anticipated time frame for this work.

### **Qualifications:**

The CAP Lab is uniquely qualified to conduct the work on this project. The CAP Lab is an AASHTO Accredited Facility for PG Binder testing. Also, the CAP Lab through the Northeast Transportation Technician Certification Program conducts PG Binder Technician Certification for the region. This certification program has worked with the Asphalt Institute's Binder Technician Certification to be part of a national PG Binder technician certification program.

The CAP Lab has also conducted numerous training courses for testing technicians and was involved in the Pooled Fund selection process to replace the original Paar Physica DSR's that were included in the original equipment purchase from the FHWA Pooled Fund equipment purchase.

Table 1 - Pooled Fund Equipment Purchase Phase 1

						FY10	FY11	Total
						4/1/10-6/30/10	7/1/10-6/30/11	
						3 mos	12 mos	
<b>A.</b>	<b>Senior Personnel</b>	<b>Salary</b>	<b>Appt</b>	<b>% Effort</b>				
	James Mahoney, PI	\$84,980	12	10%	10%	2,125	8,923	11,047
						-	-	-
<b>B.</b>	<b>Other Personnel</b>							
	A. John DaDalt, Lab Tech	\$52,080	12	5%	0%	651	-	651
	Lori Judd, Financial Assistant	\$42,377	11	10%	10%	1,156	4,450	5,605
						<b>Total Salaries</b>	<b>3,931</b>	<b>13,372</b>
								<b>17,304</b>
<b>C.</b>	<b>Fringe Benefits</b>							
	<u>Current Fringe Rates</u>	<b>Yr 1</b>	<b>Yr 2</b>					
	James Mahoney, PI	36.0%	34.8%			765	3,105	3,870
						-	-	-
	A. John DaDalt, Lab Tech	36.0%	34.8%			234	-	234
	Lori Judd, Financial Assistant	36.0%	34.8%			416	1,548	1,965
						<b>Total Fringe Benefits</b>	<b>1,415</b>	<b>4,654</b>
						<b>Total Salaries &amp; Fringes</b>	<b>5,346</b>	<b>18,026</b>
								<b>23,373</b>
<b>D.</b>	<b>Equipment</b>							-
<b>E.</b>	<b>Travel*</b>	<i>Domestic</i>				-	-	-
		<i>Foreign</i>						-
<b>G.</b>	<b>Other Direct Cost</b>							
	Supplies & Materials					250		250
	Contractuals					1,000		1,000
	Consultant Services							-
	Computer Services							-
	Subawards							-
	Other							-
	Tuition						-	-
	<u>Tuition Calculator</u>							-
						<b>Total Other Direct Costs</b>	<b>1,250</b>	<b>1,250</b>
<b>H.</b>	<b>Total Direct Costs</b>					<b>6,596</b>	<b>18,026</b>	<b>24,623</b>
<b>I.</b>	<b>Indirect Costs (F&amp;A) @</b>	<b>53%</b>				<b>3,496</b>	<b>9,554</b>	<b>13,050</b>
<b>J.</b>	<b>Total Costs</b>					<b>\$ 10,093</b>	<b>\$ 27,580</b>	<b>\$ 37,673</b>
	* Note travel funds may be added at each state's descretion to cover travel for their personnel							