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FIRST YEAR WORK PLANS

June 18 – December 25, 2007

ASPHALT RESEARCH CONSORTIUM

PROGRAM AREA:

TECHNOLOGY DEVELOPMENT

Prepared for
Federal Highway Administration
Contract No. DTFH61-07-H-00009

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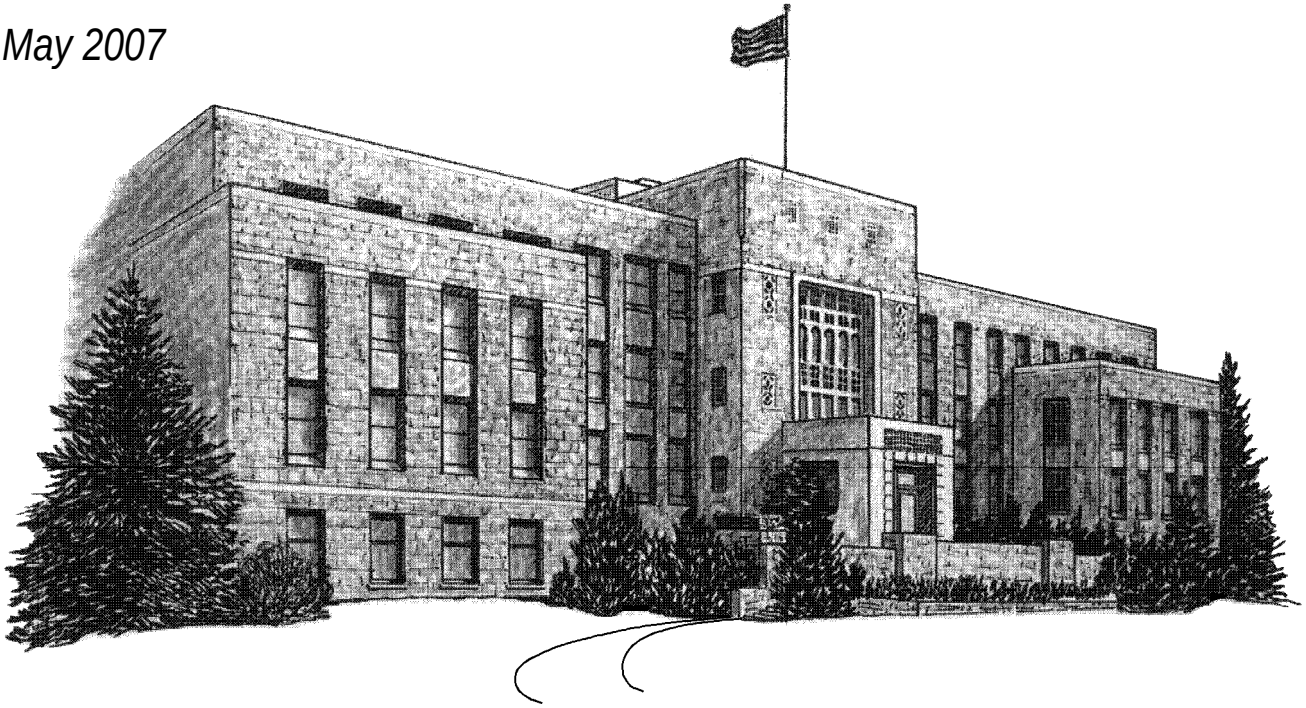

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RESEARCH PLAN FOR YEAR 1 OF FEDERAL HIGHWAY ADMINISTRATION CONTRACT DTFH61-07-H-00009 "ASPHALT RESEARCH CONSORTIUM"

FOREWORD

This document is the proposed Research Plan for Year 1 of the Federal Highway Administration (FHWA) Contract DTFH61-07-H-00009, the Asphalt Research Consortium. The Consortium is coordinated by Western Research Institute with partners Texas A&M University, the University of Wisconsin-Madison, the University of Nevada Reno, and Advanced Asphalt Technologies.

The Year 1 research plans are grouped into seven areas, Moisture Damage, Fatigue, Engineered Paving Materials, Vehicle-Pavement Interaction, Validation, Technology Development, and Technology Transfer. The format of the presentation of the work plans varies somewhat because of the different interactions of the work elements. The Moisture Damage and Fatigue areas contain work elements that are interrelated and thus will work together to advance the knowledge of mechanisms and models in these areas. In addition, there are some work elements that compliment one another by investigating a common principle using different methods. For example, in the Moisture Damage area, the principle of measuring surface energy of asphalts and aggregates is being pursued using the "macro" (or bulk) approach using the Wilhelmy plate and Universal Sorption Device for asphalts and aggregates, respectively. The surface energy of asphalts and aggregates is also being pursued using Atomic Force Microscopy at the nano scale. Using the two different methods provides a check on one another so that the true significance and importance of surface energy can be evaluated and related to performance properties. There are also examples of Modeling activities that compliment each other in a similar fashion. The Consortium members firmly believe that this approach make the research more robust.

The research areas of Engineered Paving Materials, Vehicle-Pavement Interaction, and Validation generally contain work elements that are more "stand-alone" in nature but this doesn't mean that these work elements will operate independently because in most cases, at least two Consortium partners are teaming to conduct the work. These work elements will also provide useful information to the other research activities in the Consortium.

Finally, the areas of Technology Development and Technology Transfer are the areas where the research deliverables will get transmitted to the user community. The Technology Development area will take promising research developments and refine them into useful tools for engineers and technologists involved in the design, construction, and maintenance of flexible pavement systems. The Technology Transfer area will also transfer Consortium research findings to the asphalt community using the Consortium website, presentations, publications, and workshops.

The Asphalt Research Consortium members strongly believe that the proposed research is responsive to the needs of asphalt engineers and technologists, state DOT's, and supports the FHWA Strategic Goals and the Asphalt Pavement Road Map.

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PROGRAM AREA: TECHNOLOGY DEVELOPMENT

INTRODUCTION

A major criticism of past fundamental research efforts in flexible pavements and asphalt materials is they did not produced products that were directly useable by practicing engineers and technologists. Historically, fundamental research studies have produced promising, new approaches that require substantial follow-on research, development, and training efforts before useable products are available to the profession. Even the products from the highly focused, goal oriented Strategic Highway Research Program required substantial additional effort for further development and training before being successfully implemented into design and construction practice.

The Technology Development program area has been included in the research program of the Asphalt Research Consortium to address this concern. The purpose of this program is to begin the process of refining selected products from the Fatigue, Moisture Damage, Engineered Pavement Materials, and Vehicle Pavement Interaction research programs into useful tools for engineers and technologists involved in the design, construction, and maintenance of flexible pavement systems. These tools may take the form of new or improved standard test methods, improved specifications, improved performance models, or specific design guidance for improving the performance of flexible pavements. The Technology Development program area will be closely coordinated with the Technology Transfer program area.

HYPOTHESIS

Early identification of implementable research products and further development of those products by Consortium partners will lead to more rapid acceptance of these products by practicing engineers and technicians.

OBJECTIVE

The objective of this program is to begin the process of refining selected products from the Consortium research programs into useful tools for engineers and technologists involved in the design, construction, and maintenance of flexible pavement systems

WORK ELEMENTS PLANNED

The work in the Technology Development Program Area has been organized to provide early, mid-term, and long-term products. Early efforts will focus on products developed in past FHWA research studies completed by WRI. Promising products from this past work will be developed into useable tools within the first two years of the Agreement. Mid-term and long-term efforts will focus on research being performed in the Fatigue, Moisture Damage, Engineered Pavement

Materials, and Vehicle Pavement Interaction program areas and in the current FHWA/WRI Fundamental Asphalt Research contract. Mid-term products will be available in Years 3 and 4, and long-term products will be available at the end of the contract or later.

Work element TD1: Prioritize and Select Products for Early Development (Year 1)

A number of test procedures, analysis methods, and models were developed by Consortium partners using funding provided by previous FHWA/WRI Fundamental Asphalt Research contracts or other federal sources. This work element will consist of prioritizing and selecting the most promising of these for development into early Asphalt Research Consortium products. For each potential early product, the developing Consortium member will prepare a brief summary of the product. This summary will describe the product, the potential user of the product, and how the product can be used to improve asphalt pavement technology. A Product Review Committee composed of one representative from each Consortium partner, one FHWA representative, and three representatives from each of the ETG's will review the product summaries and rate the products based on two criteria:

1. The relevancy of the product to current critical issues in asphalt pavement technology,
2. The practicality of implementing the product by highway agencies, industry, and research agencies.

Products receiving the highest overall ratings will be recommended for further development. For those products that are recommended, a Product Review Team will be established by the Product Review Committee to guide the additional development that will take place in Work Element TD2.

Work element TD2: Develop Early Products (Year 2)

It is envisioned that several early products will be identified by Work Element TD1. In Work Element TD2, these products will be further developed as needed. The general approach will be for the Consortium to prepare a detailed product development plan and budget for review by the Product Review Team and the FHWA AOTR. Once agreement is reached on the scope and budget, the assigned Consortium partner will undertake the development effort. It is envisioned that these early product development efforts will require one year or less to complete.

Work element TD3: Identify Products for Mid-Term and Long-Term Development (Year 2, 3, and 4)

As research by the Consortium progresses, it is envisioned that potential mid-term and long-term products will emerge. These potential products will be identified in the Quarterly Progress Reports submitted to the AOTR. When the AOTR concurs that a viable mid-term or long-term product has been identified, the potential product will be assigned to the Product Review Committee for detailed review based on the criteria established in Work Element TD1. The Product Review Committee will recommend the one of the following specific actions for the potential product:

1. Proceed to development.

2. Reassess after completion of additional research.
3. Eliminate from further consideration.

For those products recommended for development, a Product Review Team will be established by the Product Review Committee to guide the additional development that will take place in Work Element TD4.

Work Element TD4: Develop Mid-Term and Long-Term Products (Years 3, 4, and 5)

It is envisioned that several products will be identified by Work Element TD3. In Work Element TD4, these products will be further developed as needed. The general approach will be for the Consortium to prepare a detailed product development plan and budget for review by the Product Review Team and the FHWA AOTR. Once agreement is reached on the scope and budget, the assigned Consortium partner will undertake the development effort.

Anticipated Participation of the Consortium Partners in Technology Development

Element	Title	Consortium Partner				
		WRI	TTI	UWM	UNR	AAT
TD1	Prioritize and Select Products for Early Development	X	X	X	X	X
TD2	Develop Early Products	X	X	X		X
TD3	Identify Products for Mid-Term and Long-Term Development	X	X	X	X	X
TD4	Develop Mid-Term and Long-Term Products	X	X	X	X	X

YEAR 1 PROJECT DIRECTION

First year efforts in the Technology Development Program Area will be directed at completing Work Element TD1: Prioritize and Select Products for Early Development. To accomplish this it is critical that the FHWA and each ETG identify its Product Review Committee members during the July meetings of the ETGs.

SCHEDULE

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Work Element TD1	**X**				
Work Element TD2		**X**			
Work Element TD3		**X**	**X**	**X**	
Work Element TD4			**X**	**X**	**X**

RELATIONSHIP TO FHWA FOCUS AREAS

The Technology Development Program Area supports the FHWA Focus Areas of Optimizing Pavement Performance, Advanced Quality Systems, and Technical Capability Building.

BUDGET

The budget for the Technology Development Program area is estimated to initially be $1.12M over the five years of the project. However, it is expected that as procedures, methods, and models are developed, the Technology Development area will be increased.