Project Number: 0-4678

Title: Pavement Requirements for Weigh-In-Motion Hardware

RMC Number: 1 Strategic Issue 4, Topic B

Developed By: Rich Rogers, Revised by Dr Claros RTI

Project Statement Date: January 23, 2004

Program Coordinator (PC)
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Project Director (PD)
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Project Monitoring Committee (PMC) (Project Advisors Optional)

Duration (# of years): 5 Total Budget: $ Budget by year:
First Year FY $ Second Year FY $ Additional FYs $

Project Description: The thrust of this project statement is to find a less costly foundation for a WIM site. TxDOT has found the cost to build a 500’ CRCP section (four lanes divided) can range from $250,000 to $600,000. ACP while far less expensive, has significant modulus changes due to temperature changes and thus has a significant effect on the load measured. The condition of the pavement wherein WIM equipment is installed is one of the key elements that influences the quality of data collection. The environmental conditions are also important. The pavement section where WIM equipment is to be installed must be straight, smooth and strong. The surface bound layer must be of sufficient depth to support installation of WIM hardware without going into base material or cutting re-bar.

The following phases are envisioned for the development of this project:

Phase I:
1. Develop new pavement designs for alternative installation of the following WIM systems: bending plate, and quartz-piezoelectric sensors and any other system that is proven to work. The pavement designs should consider the capabilities and limitations of each sensor.
2. Develop remedies for existing pavements which may include but not limited to surface treated pavements, thin ACP (<3”) and full depth ACP. Strategies should include but not be limited to:
   - A carefully designed CTB section with a thin wearing surface.
   - Mill ACP and white topping, with fiberoius PCCP. A sleeper slab would be needed for Bending Plates.
   - The use of exotic materials such as ceramic-ete and others should be considered.
3. Conduct an engineering evaluation through computer simulation to identify the best candidate sections for further field evaluation. Once they have been identified, develop plans and specifications for the construction of these sections along with approximate construction costs.

Phase II:
4. Construct the most promising designs for further field monitoring of the performance of these pavement sections. TxDOT will fund the construction cost using funds outside of the research budget.
5. Install test sections, with multiple promising alternative installation designs, in two to four environmental/geographical areas, on rural TxDOT roads, with heavy trucks. Selection of the test section locations should be done in coordination with TPP, to help ensure the sites selected will also meet the TPP WIM Strategic Plan needs. (The construction of the test sections will be funded separately).
6. Conduct an initial and annual test site evaluation of the following:
   - WIM system performance
   - Pavement Profile
• Pavement Condition
• WIM data trends and correlations

7. Develop the final reports which document the findings and provide recommendations
8. Develop Guidelines for alternative WIM installations in thin flexible pavements.

It is envisioned that Phase I of this project will have a duration of one year. At the end of the first phase the PMC of the project will approve the continuation of the second phase depending on the outcome of the first phase.

**Deliverable Products And Reports:**

The following products and reports are required as a minimum:

1. Initial first year report documenting the work performed in the first year including a plan for the remaining duration of the project.
2. Develop guidelines and design procedures for pavement design and WIM installations in new and existing pavements.
3. Final report(s) that fully documents the research performed, findings and recommendations.
4. A Project Summary Report concisely outlining the research, findings and recommendations (4 pages)

**Implementation:**

The success of this project will allow WIM sites to be installed cost-effectively on FM, SH and other ACP location. This project product will have potential state-wide implementation.

**Pre-Proposal Meeting:**

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Tuesday, February 10, 2004, 1:30 p.m. to 2:30 p.m. at 4000 Jackson Avenue, Bldg. 1, Austin, TX in the San Jacinto Conference Room, 3rd floor. Teleconferencing is available.

**Sole-Source Project:**

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**Additional Information:**

N/A

**Proposal Submission:**

- Proposals are required to be submitted in both hard copy (4 copies) and PDF format (1 PDF file per proposal). Both formats are used within TxDOT for evaluating the proposals and must contain identical information.
- The “Background and Significance” portion of the proposal should be limited to 10 pages.
- All proposals from researchers should be sent directly to your university’s Research Liaison for submission to RTI. The Research Liaison is TxDOT’s official contact with the university.

**Deadlines (for RTI use only):**

1. All individuals interested in proposing are encouraged to contact the PC/PD by February 6, 2004.
2. Proposals are due to RTI by 4:00 p.m. CST on Wednesday, March 24, 2004.