

# RESEARCH AND TECHNOLOGY

# REVIEW

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## RESEARCH BULLETIN

### **NCHRP Report Research Implementation Boosters, Barriers and Strategies**

The importance of research implementation is well received in most transportation agencies, but how to implement research is often perplexing. As pointed out in the National Cooperative Highway Research Program (NCHRP) report 382, implementation strategies themselves, not the end product, often make the difference between success and failure in implementing promising new practices, processes and products resulted from research. The report, "facilitating the implementation of

research findings: a summary report," lends some valuable insights into the processes by which research is implemented.

Through a comprehensive review of current knowledge about facilitating the implementation of research results, a detailed review of relevant surface transportation literature, and an extensive interview with transportation professionals, some major factors that influence-positively (known as boosters) and negatively (known as barriers) - the transfer, application, and use of research results were identified as follows:

#### **1. The top twelve implementation boosters**

- ◆ Pilot projects done in real user settings
- ◆ Innovation matches user's need
- ◆ Strong commitment from senior management
- ◆ Adequate funding
- ◆ Collaboration among users, researchers, vendors
- ◆ User participation in vital stages of the R&D
- ◆ Champion for the project on site
- ◆ High level of relevant technical skills
- ◆ Implementation package and continued support
- ◆ Demonstrable advantages for the innovation

- ◆ Clear goals for the implementation effort
- ◆ Targeted funding for the implementation

*(NCHRP continued on page 3)*

### **Qualified Product Lists (QPLs)**

Scattered in the NDOT specifications are some manufacturers' names and addresses in the form of lists that provide approved products for product users to choose from for a specific purpose. These lists are often referred to as qualified product lists (QPLs), pre-qualified product lists or approved product lists. These lists not only provide information on the vendors/manufacturers who supply the materials/products called for on a *(QPL continued on page 3)*

### **NCHRP Funds WesTrack Completion**

ASHTO has taken action to address the issue of funding for ongoing FHWA research left unfunded by TEA-21. Specifically, the completion of WesTrack (the Superpave performance test track) will not be funded as a pooled-fund project

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**December 2, 1998 PEC Meeting:** Left to right; Scott Thorson, Traffic; Thor Dyson, District II; Alan Hilton, Research; Terry Springman, Maintenance; Gary Anderson, Specifications; George Townsend from Lumi Trak; Gene Weight, District I; Rod McInnis, Structures Design; Dale Lindsay, Operations Analysis; Chuck Nixon, District III; Greg Novak, FHWA.

**Field Test**

**Watson Bowman Acme Corp.**  
Wabco Two Part Silicone

Similar in chemical and physical properties to the field-tested and approved DOW 902 RCS (rapid cure silicone) bridge joint sealant, the WABO two part silicone sealant can be considered as a competitive alternative. Based on a thorough review of the information provided and a recommendation from the Structural Design Division, the PEC approved a field test of this product, preferably at a location with high truck traffic.

The WABO two part silicone sealant is a cold-applied, rapid-curing and self-leveling product used for bridge deck expansion joints with up to 3" joint openings. According to the vendor, the major advantage of this product over the DOW 902 RCS is that this product does not require any priming when installed against elastomeric concrete headers, steel armoring or concrete interfaces. It also passed 5000 hours of weather testing without cracking, chalking or crazing.

The field test of this product is intended to evaluate its overall performance relative to other approved products such as DOW 902 RCS for small movement bridge expansion joints. If its performance is satisfactory, it will be considered for

use on a case-by-case basis for both new construction and bridge rehabilitation projects. ☆

**Field Test**

**Lumi Trak, Inc. Luminaire Retrieval System**

Believe it or not, repairing or replacing luminaires on overhead sign structures may no longer require closing travel lanes or otherwise interfering with traffic. At the December 2, 1998 meeting, the PEC approved a field test of the Lumi Trak Luminaire Retrieval System from Lumi Trak, Inc.

As a replacement for conventional walkways that are utilized to provide access for the workers to repair luminaires on overhead sign structures, the Lumi Trak system utilizes a track mounting system that provides for the retrieval of luminaires for service from the shoulder of the roadway, thus eliminating the need for lane closures and reducing maintenance cost. The system can be used on both span and cantilever overhead sign structures

requiring sign lighting. To evaluate the claimed merits of this system and obtain information necessary

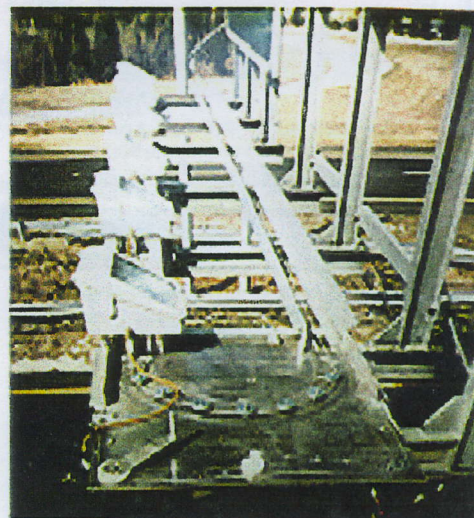


Photo 1. Lumi Trak, Inc. Luminaire Retrieval System

to specify the product, the luminaire retrieval system will be installed on an existing sign structure in District II. It is hoped that the system will be approved for use as an alternative to walkways on projects requiring overhead sign lighting. ☆

**On-Going Field Test  
Breakaway Signpost Bases**

By Jeff Johnson and Gene Bails - Roadway Design

The Washoe Valley sign test, on FR WA-45 next to US 395 at the south end of Washoe Valley, officially started back on March 17, 1998. The objective of this test is to evaluate eight roadway signs with different bases in order to solve the problem of signs being blown off their bases (wind-walking). Four of the signs were installed using the Dent breakaway bolt system. Two signs were installed using a variation of the NDOT 1999

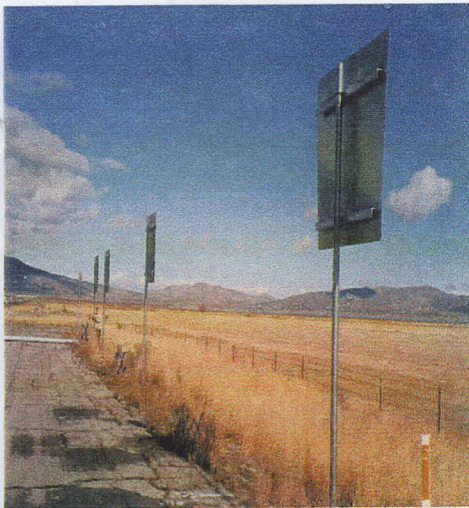


Photo 2. Breakaway Sign Base Test Site

Standard Plans, and the last two signs using the POZ-LOC single and double post systems.

Three of the signs blew down during the severe windstorm that came through Washoe Valley on November 7, 1998. Two were the Dent three bolt breakaway systems and the other one was the single POZ-LOC signpost. Also, one installation that is still standing has cracks in two of the three Dent breakaway bolts. In other words, four of the eight signs (fifty percent) failed during the first eight months of the test.

It is hoped that the test will help solve the wind-walking problem currently associated with breakaway sign bases. Of particular interest to NDOT is the performance of the design based on the NDOT 1999 Standard Plans drawing. It incorporates hardened washers, a nylon insert stop-nut, and a reduced degree of torque to ensure proper breakaway on impact. ☆

*(NCHRP continued from page 1)*

## 2. The top twelve implementation barriers

- ◆ Mismatch between research & user needs
- ◆ Research output not sufficiently tested

- ◆ Research output doesn't fit work procedures
- ◆ Discomfort with change
- ◆ Organizational inertia
- ◆ Risk aversion
- ◆ Researcher-user culture gaps
- ◆ User successes unpublicized
- ◆ Poor quality/relevance filters
- ◆ Political involvement of managers
- ◆ Researchers not market-oriented
- ◆ Inflexible contract specifications

Based on the above findings, case history studies and the assumption that prerequisites such as a genuine need for change, strong support from senior management and sufficient funding for successful implementing of research are met, the following implementation strategies are recommended to promote the successful and timely application of research results. In general, these strategies should be used in conjunction with one another whenever possible.

- ◆ **Develop plan and goals for implementation**
- ◆ **Select products or processes for implementation that have demonstrable advantages**
- ◆ **Commit qualified people to the job of implementation**
- ◆ **Use pilot project and field demonstration**
- ◆ **Promote continuous collaboration between user and researcher/developer**
- ◆ **Reward the high-quality efforts to improve the implementation of research results**
- ◆ **Institutionalize innovation**

*(The NCHRP Report 382 is available for loan from the Planning Library) ☆*

*(QPL continued from page 1)*

project, but also serve as a part of a departmental quality assurance plan to ensure the products to be used meet or exceed the specifications.

The products on the lists are approved

by the department through the established product evaluation process. They have been reviewed, tested and/or used by NDOT and found to be suitable for the application(s) as listed. For a product to get on a list, it must go through the departmental evaluation process. Once a product is approved, it remains on the approved list as long as it performs satisfactorily, and the product formulation remains the same. However, it must be emphasized that an approved product list is only used to pre-qualify products and should not be construed/perceived as a performance guaranty or substitution for the materials sampling and testing program. The approved products are still subject to other departmental material/product quality assurance/control programs. Also, product approval is not intended as an endorsement by NDOT.

The Research Division is responsible for administering the product evaluation program. Program responsibilities include: responding to and documenting all vendor inquiries; disseminating policies and forms related to vendor and internal requests for product evaluations; tracking evaluations through a computerized database; conducting user surveys and literature searches; and preparing agendas and maintaining records of the Product Evaluation Committee meetings.

As the program advances, developing and maintaining QPLs become essential elements of the product evaluation program and thus new responsibilities of the Research Division. In an effort to provide a comprehensive listing of all products that have been evaluated by the department, the Research Division developed and distributed the Product Status Listing (PSL) as a reference resource for staff who are responsible for the selection and/or approval of products. However, the PSL is not widely accepted, or used, mainly because it was not incorporated into the

specifications. Currently, the Research Division is working with Gary Anderson (the specification engineer) and affected divisions to incorporate the approved products in the PSL into the specifications via a QPL attachment in the Pull Sheets. ❖

*(WesTrack from page 1)*

as reported in the last edition of the newsletter. Rather, the completion of WesTrack will be funded from unobligated FY 1998 National Cooperative Research Program funds as will other components of SHRP implementation left unfunded in TEA-21. ❖

### Research Activity Update

**A**s the technical representative for Nevada and the research proposal submitter, Tie He (Research Division) attended the first

technical advisory committee (TAC) meeting for the national pooled-fund research project "Electrochemical Properties and Reactions at the Surfaces and Interfaces of Concrete Aggregates, Cement and Mineral Admixtures," on November 3, 1998 at the FHWA Turner Fairbank Research Center in McLean, Virginia. In the meeting, He gave a presentation on the project statements including a brief explanation of the electric double-layer theory and the scope of work proposed.

Although the research idea is laudable, He came back with a mission to further define the scope of work. With the full support of the Materials Division, He has been working in the Materials Laboratory to complete the task of collecting and analyzing preliminary data. The TAC will meet again next April to discuss the possibility of contracting out the work. ❖

The Research Division administers the department's research, development and technology transfer program and serves as the "clearing-house" for product evaluations.

**Research and Technology Review** is published quarterly by the NDOT Research Division. Its purpose is to provide the latest information on the NDOT research activities including product evaluation and other pertinent research topics.

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