MARKET-READY TECHNOLOGIES AND INNOVATIONS

Technology deployment is one of the Federal Highway Administration’s (FHWA) key business processes. In the beginning of 2006 FHWA issued an updated list of 24 Priority, Market-Ready, Technologies and Innovations (T&Is), including six new innovations endorsed by FHWA’s Research and Technology Leadership Team, that it believes warrant special attention, and adopted five technologies selected by the American Association of State Highway Transportation Officials (AASHTO) Technology Implementation Group. These T&Is are part of a national initiative to promote new and upgraded technology and innovation. The FHWA has developed brief one-page summaries on these technical advancements and innovations. Some examples of T&Is are Road Safety Audits, QuickZone software, Maintenance Decision Support System and Accelerated Construction Technology Transfer. A complete list of the 24 T&Is can be found on http://www.fhwa.dot.gov/crt/lifecycle/ptisafety.cfm. This site includes individual summaries of each T&I, an application of the technology or innovation, deployment goals and technical contact information.

This list is not intended to include all T&Is available. Many are being developed, but are not yet ready to be put into use, others are considered good concepts, practices, and/or success stories that should continue to be shared. The list is intended to be a living list and is updated periodically. These solutions are presently being deployed successfully in various States and regions across the country and FHWA supports their application nationally, when deemed appropriate to help the transportation community gain a better value for its dollar. Currently the New York Division Office of the FHWA is collecting information on the status of implementing the T&Is in the State of New York. We realize that many of these T&Is have already been implemented in New York but we would like to hear from program experts on their outcomes, whether successful or not. The information collected by all States on the status and outcomes of using the 24 Market Ready Technologies will be shared nationally. We anticipate this information will be very helpful to the State of New York.

If you have information on any of the T&Is to add to this database or if you have any questions about this initiative please contact Christine Thorkildsen at: Christine.thorkildsen@fhwa.dot.gov.
MOVING RESEARCH INTO PRACTICE
IN
NEW YORK STATE DEPARTMENT OF TRANSPORTATION

In August 2006, a joint team from the Federal Highway Administration (FHWA), New York Division, NYSDOT’s Policy & Strategy Division, and the Transportation Research & Development Bureau completed a study which reviewed research implementation in the Department. The study found that Department-sponsored research projects provided useful information and that research was completed successfully. The study also revealed that 65% of completed research projects were implemented and underwent technology transfer activities.

Although the findings are not unique to NYSDOT, they underscore the need to strengthen implementation of research results to achieve maximum return on research investments and realize the promise of instituting cutting edge innovations and moving research products into practice.

There are many misconceptions about implementation which serve as real impediments to transferring research products into practice. Below are several common myths associated with implementation that the Transportation R&D Bureau invites you to shatter and consider the benefits of proactively implementing research products produced here and elsewhere.

Myths of Implementation

1. Making research products available is all we need to do to ensure these products are utilized.

Implementation is a complex process that involves change. Change does not occur automatically or concurrently in an organization. The complexity of the implementation process is exacerbated by the fear of change and attachment to the status quo. For implementation to be instituted in an organization, resistance to change must be overcome. Successful implementation of research requires dedicated, determined and proactive measures and involvement of all stakeholders. Implementation does not occur on its own.

There are generally three stages in moving research products toward implementation within the Department’s operations.

A) Synthesis of research findings- At this stage, knowledge produced by researchers is evaluated to determine items that require implementation.

B) Packaging of research findings- The second stage in the transfer process involves the translation of research products into tools that make possible the adaptation and adoption of the conceptual products into real life contexts. Packaging may include development of guidelines, information materials, training, and/or change in policies and procedures, etc.

C) Adoption of research products into practice- At this final stage, research products are adopted by the end-users and instituted within Department’s operations through the use of the packages developed in the second stage. This stage also involves evaluations to assess the success of the implementation of research products and the achievement of desired outcomes.

(Continued on Page 3)
2. Implementation is too costly. We do not have the resources to conduct activities that fall outside our operational plan.

Implementation is the logical application of research results which create an atmosphere conducive to adopting research innovations into practice. Each year the Department invests significant amounts of federal and state funds to support research that provides innovative solutions to transportation problems, leads to improvements, increased efficiency, and cost reduction. If the results of those research efforts are not implemented into Department operations, this means that valuable investments were not effectively utilized. Moreover, for each research project the Department undertakes, an implementation plan is developed, and depending on the type of products, funds may be allocated to execute the implementation plan. Your program area may not incur any costs as a result of implementing Department-sponsored research findings.

3. Implementation is too time-consuming. We do not have the capacity to divert our energies away from our operational goals.

The Transportation R&D Bureau has researchers who will work with your program area to facilitate implementation of research products into your program area operations. The Transportation R&D research staff will work with you on developing a technology/research implementation strategy. This strategy encompasses setting implementation goals, defining target audiences, determining specific needs relative to the goals, setting reality parameters in terms of practicality and feasibility issues that must be considered, performing impacts assessment, and monitoring outcomes.

4. We are already implementing evidence-based practices. Why change what works?

The promise of increased efficiency and cost-effectiveness that cutting edge innovations hold is too great to ignore. The potential for addressing real and persisting transportation challenges is significant. Numerous studies documented the operational value of implementing research products. The fact that research not only helps address persisting transportation problems, but can enhance efficiency and effectiveness of how the system is managed is also well documented in the literature.

5. We operate in a multi-layered, complex system and these kinds of decisions are made at the top. Even if we want to do things differently, we do not have the power to make it happen.

Change may occur from the bottom-up as well as from the top-down. A key criterion for change to take place is the existence of persistently determined and dedicated champions who advocate for change to take place. Moreover, the Department’s leadership is fully supportive of the implementation of cutting edge innovation into the Department’s operations. That support is reflected in the Department’s vision and mission statement.

6. These innovations were not developed here. These researchers are not familiar with our operations.

Department-sponsored research has the advantage of being fully tailored to the needs of NYSDOT. From inception to completion, research projects are guided by Department staff through an interactive
process. The process ensures that the products conceived from the research effort address the specific problems identified by Department staff. In case implementation is carried out for research studies conducted elsewhere, TR&DB will work with your program to perform all necessary adaptation, marketing, diffusion and adoption of the research results ensuring that it will achieve its intended goals and will live up to its expectations.

For further information about implementation/technology transfer services, please contact Sam Elrahman at (518) 457-4689.

**COMMERCIAL VEHICLE TELEMATICS – RESEARCHING & DEVELOPING ITS SOLUTIONS FOR TRAFFIC MANAGEMENT IN NYS**

The New York State Department of Transportation (NYSDOT), in partnership with the New York State Energy and Research Development Authority (NYSERDA), is advancing a research and development project to investigate the use of commercial vehicles as data probes. In the fall of 2006, NYSERDA entered into an agreement with Calmar Telematics LLC to undertake work that is funded by NYSERDA, NYSDOT and the Federal Highway Administration (FHWA). Calmar started the project in early 2006. In addition to the primary project focus of providing real-time traffic management information, this effort may also disclose substantial planning level information about freight movements and traffic flows.

The research project will attempt to develop a universal real-time highway information system called Highway Visibility System that uses technologies and partnerships that mine the vast data sources of commercial vehicle-to-dispatch messaging systems. The system will yield measures of traffic congestion, road impacts by trucks, and goods movement. This project assists highway management and operations and reduces the need for maintenance-intensive pavement or infrastructure-based data collection equipment. In light of projections of double digit percentage increases in vehicle miles traveled (VMT) and a doubling of truck volume over the next 20 years the data has considerable value.

**How it works**

![Diagram of Fleet Management System](image-url)
As shown in Figure 1 (above), beginning at the Starting Point (at about 10 o'clock) and proceeding clockwise, the fleet GPS data is transmitted by satellite to the fleet’s data collection system. The data then passes through firewalls and is encrypted before going to Calmar’s processing into traffic data. Finally, the traffic data is made available to its customer base via the internet. The concept uses only the existing data transmission systems of commercial vehicle fleets. It does not require any additional infrastructure-based sensors for information to be transferred. Under this effort the participating Commercial Vehicle Operators (CVOs) agree to give Calmar access to their transmission data for analysis. By looking at commercial vehicle flows, Calmar will determine the level of service on roadways from real-time speed, location and other pertinent data. For a fee, commercial vehicle operators can access the processed data through a website, including analysis customized for their operations.

Enhanced Data Collection

Calmar has recently formed a relationship with the New York State Motor Truck Association (NYSMTA) to be an agent and act as an auditor of the commercial vehicle fleet data. This relationship with NYSMTA provides an increased level of expertise, visibility and credibility within the trucking industry. The web-based interface to the processed data will initially provide general truck location services, congestion mapping, and local weather related information. Eventually, more advanced services and tools will be available to participating CVOs and other users.

“iCone” SMART TRAFFIC CONE

Work zones put people in close proximity to traffic making their safety an important consideration (Figure 2). A work zone information system is currently being developed by Calmar Research. The system, which is called iCone, is a “smart” traffic cone utilizing a GPS device that, when activated, transmits vehicle location and traffic speed to a database. The real-time data could be provided to state agencies, media outlets and private highway information service providers for driver safety information, traveler routing information and oversize vehicle permit routing.

How it Works

The instrumented cones can be placed at the start and end of a work zone and activated. The GPS devices would transmit traffic data to a central server at regular intervals via a wireless network.
### iCone Device

The internal equipment of the cone is designed to work anywhere, under any condition, at any time. The GPS unit is encased inside a waterproof, shock resistant shell making it very durable. The cone itself can be designed to appear similar to and function as an existing work zone cone but also to allow easy recognition as an instrumented cone by contractors and work crews. One example of a cone design is included below (Figure 2).

For Further information about Telematic Traffic Management Solutions, contact Deniz Sandhu at 518-457-4687 or dsandhu@dot.state.ny.us

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**Are you working on something new and innovative that could be included in the next newsletter?**

Please contact Ossama Elrahman or Colin Campbell, Transportation Research and Development, or send us an e-mail at trdb@dot.state.ny.us

*Technology Transfer News* is published by the Transportation Research and Development Bureau, New York State Department of Transportation, which is solely responsible for its content, in cooperation with the Federal Highway Administration, U.S. Department of Transportation. Requests for addition to its mailing list and inquiries concerning its contents should be addressed to Gary Frederick, Director of Transportation Research and Development Bureau, New York State Department of Transportation, 50 Wolf Road, Mail Pod 3-4, Albany, NY 12232. Ossama Elrahman and Colin Campbell are responsible for the coordination and publication of the Technology Transfer News. Newsletter layout by Colin Campbell and Jeff Kerner.

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