Clemson University recently completed research project SPR 659, “Benefit Cost Analysis of Accelerated Incident Clearance.” Dr. Mashrur Chowdhury served as Principal Investigator for the project and Richard Jenkins, SCDOT Traffic Safety & Systems Engineer, chaired the project’s Steering and Implementation Committee. Other members of the Committee were Dan Campbell of the SCDOT Traffic Office, David Law from Federal Highway Administration, and Lt. M. C. Bowman and Sgt. Robert Woods of the South Carolina Department of Public Safety.

This study examined the current state of the incident management industry in the US by reviewing available published literature and by launching a nation-wide survey of multiple incident management agencies. The study also evaluated the specific impact of traffic incidents on both motorists and the environment on South Carolina freeways by using traffic simulation and benefit-cost analysis. Survey responses revealed that technologies such as traffic cameras, dispatched personnel, and freeway service patrols were the most successful in detecting and verifying incidents. Responses also emphasized the importance of effective institutional coordination, and communication to both the public and the decision makers for a successful incident management program. Through traffic simulation analysis, researchers examined the effectiveness of traffic sensors, traffic cameras, freeway service patrols, a multiple-
strategy approach, a “Steer-it Clear-it” law, and route diversion.

Benefit-cost analysis justified investment in incident management. Analysis results indicated that freeway service patrols produced $11 of benefit for every dollar invested. Using traffic cameras to detect and verify incidents produced $12 of benefit for each dollar invested. Using traffic sensors to detect incidents and traffic cameras to verify incidents produced $7 for every dollar invested. While the multiple strategies scenario, representing a combination of above strategies and telephone calls by motorists reporting incidents, produced high benefits compared to the previous strategies, it only produced $8 for each dollar invested due to required investment in several systems.

The benefit-cost analysis showed high returns for the “Steer-it Clear-it” and the route diversion scenarios. The “Steer-it Clear-it” scenario produced approximately $22 for each dollar invested if all citizens were aware of and obeyed the law. While 100-percent compliance is unrealistic, these results justify investment in an aggressive statewide advertisement to increase motorist compliance. The route diversions evaluated produced approximately $55 for every dollar invested. While route diversion options are not available at all possible crash locations, these results justify future investments in route diversion planning.

In addition to the final report, this study also produced a brochure and a voice-embedded presentation describing the benefits of an effective incident management program. An electronic copy of the final report and a one page summary are available on the SCDOT Research Webpage at http://www.clemson.edu/t3s/scdot/.

Research Advisory Committee 2007 Annual Meeting

The American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee (RAC) provides advice on research matters and general transportation issues to the Standing Committee on Research (SCOR) and the AASHTO Executive and Policy Committees. The annual meeting for 2007 will be August 6-9 in Seattle, Washington. Discussions will include the status of national transportation research programs, research partnerships with universities, research project management, and documenting the value of research.
In-House Investigation Committee

The In-House Investigation Committee is composed of staff engineers and managers at SCDOT’s Office of Materials and Research. Members conduct small-scale research investigations, or studies, often pertaining to products or materials issues in their respective areas. Studies included in the program often involve placement and monitoring of test sections in the field with little laboratory testing required. Therefore, projects are relatively inexpensive. If studies arise that appear to be of sufficient magnitude to conduct as a SPR project, they are presented to the Department’s Research and Development Executive Committee (RDEC) with a request for funding through the SPR Program.

The Committee meets semiannually for members to provide updates on the status of their studies and to discuss need for new investigations. The spring meeting of the Committee was held May 3, 2007. Progress reports were presented on twenty-three investigations one of which, Study No. 92-8, “Blacksburg Aggregate in Surface Courses,” was closed during the meeting. Four new studies were discussed. Three of the studies will be conducted through the In-House Investigation Program. They are:

- 07-1, “Monitoring of Field Performance of Micro Surfacing”
- 07-2, “Evaluation of Kessler FMO 200 Field Moisture Oven”
- 07-3, “Comparison of Barnstead Thermolyne SS Detect to AASHTO T84”

The remaining proposed investigation involves follow-up monitoring of sections of asphalt pavement originally included in a completed SPR project, SPR 626, “Laboratory and Field Evaluation of Temperature Differential in HMA Mixtures Using an Infrared Camera.” The decision was made by the Committee to conduct the study in-house as an SPR project pending approval by the RDEC.
SCDOT Current and Completed Research Projects

For a complete list of current and/or completed research projects, please visit the Materials and Research web site located at www.ces.clemson.edu/13/scdot. The current Research Projects list the project name, principal investigator, and the objective of the project. The completed research project page shows summaries of completed research projects and a number of them have pdf copies of final reports attached. The Research Problem Statement Form is also located on the web site for your convenience.

A group of researchers from Clemson University and The Citadel, led by Dr. Wayne Sarasua, recently completed research project SPR 658, “Better Management for Speed Control in Work Zones.” The topic was proposed at one of the South Carolina Department of Transportation’s (SCDOT) Research Workshops and approved for funding by the Research and Development Executive Committee (RDEC) through its balloting process. Statistics from SCDOT for incidents between 1998 and 2002 revealed that a leading cause of crashes in work zones was driving too fast for conditions. The project was initiated in April 2005 with the primary objective to develop methods for improving observance of posted speed limits by motorist traveling through work zones.

Research tasks included a literature review, survey of states, and field trials of several devices. Based on the literature review and meetings with the project’s Steering and Implementation Committee, a number of devices and deployment strategies were selected for field evaluation. The selected devices included drone radar, changeable message sign with radar (CMR), speed monitoring display (SMD) with changeable message sign (CMS),...
portable rumble strips, and a novel speed activated sign designed by the researchers. The devices were placed and results were monitored at a variety of different work zone sites on Interstate and Primary Routes around the state. Some of the devices were also studied in combination with law enforcement.

A variety of methods were used to evaluate the speed reduction devices including digital video surveillance, radar and laser speed detection, and monitoring CB radio. Data was collected for 60 field studies at 17 different work zone sites. Statistical tests were used to analyze the data collected for the study.

General findings indicated that all the devices were effective to some degree in the short term. Other more specific findings included:

• drone radar had limited effectiveness but widespread deployment in SCDOT vehicles in work zones was recommended due to low cost and ease of use;
• CMS with radar, though the most costly, was found to be very effective;
• the speed monitoring display with CMS was effective on 2-lane and 4-lane roads and is more cost effective than CMS with radar;
• when enforcement is present, speed monitoring display with CMS is very effective when it includes a feedback message that there is active enforcement;
• novel speed activated signs are also effective on 2-lane and 4-lane roads and are very portable and extremely cost effective;
• portable rumble strips were effective, but due to their expense and time to install, it was recommended that they be used in long-term work zones;
• devices should be turned off or removed if work zones are not active.

In-depth discussions of the results of the literature search, the responses to the survey, and the devices tested, including their effectiveness in reducing mean speed in work zones as well as their costs, are included in the final report. An electronic copy of the report and a one page summary are available on the SCDOT Research Webpage at http://www.clemson.edu/t3s/scdot/.
Comments and Suggestions

The **RD&T Newsletter** is published on behalf of the SCDOT by the SC Transportation Technology Transfer Service (T^3^S) at Clemson University.

If you have suggestions, comments or article submissions for the newsletter, please contact Mike Sanders at 803-737-6691, or mail them to:

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**RD&T Newsletter Goes Electronic**

Surprise! Surprise! Surprise! This is the first entirely electronic version of the RD&T Newsletter. The Research & Development Executive Committee (RDEC) voted to discontinue printing the newsletter at their summer meeting. The cost of printing and mailing the newsletter continues to increase, and simply, it just makes sense to send it via email. An electronic version also makes it easier for you to share with your co-workers, vendors, and customers. Thank you for your support of the Office of Materials and Research.