IOWA DEPARTMENT OF TRANSPORTATION
RESEARCH news
Iowa Department of Transportation
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Lights! Camera! New Study Eyes Urban Teen Drivers

Nearly everyone remembers the happy days of learning to drive. Unfortunately, there are many who die or have devastating injuries due to incidents caused by inexperience and/or unsafe actions. Motor vehicle crashes are a primary cause of death among young teens.

A new pooled-fund study led by the departments of transportation in Iowa and Minnesota and General Motors Corporation is aimed at reducing unsafe driving behaviors of newly licensed teens. This three-phase study will examine teen driving during the first 6-12 months after a license is obtained and be based on an event-triggered video system that will record driving behavior.

Built on the framework and protocols of a rural teen driver study currently being conducted by the University of Iowa, the new study will involve 40 teens (20 males and 20 females) recruited from a high school in the Minneapolis-St. Paul area.

Participants will have a DriveCam event recorder, no larger than a deck of playing cards, mounted behind their rearview mirrors. Unsafe driving actions such as abrupt accelerations or braking or erratic steering trigger the system to record 20-second before-and-after video and audio clips. The recorder makes it possible to keep an eye on what happens immediately before an incident. Where was the driver's attention directed? Were there risky behaviors taking place between the driver and passengers? Answering these types of questions will help generate new avenues of education, decision support, licensing and training and, hopefully, result in fewer crashes.

Data from the on-board diagnostics port, such as speed, throttle position and brake activity, can also be recorded and synched with the video clips with data downloaded weekly via a wireless network located at the high school.

Initially a four-week baseline period will allow the DriveCam to record events without giving drivers an indication it is recording, establishing normal behavior and giving teens time to grow accustomed to the system in their vehicles.

In Phase 2 the DriveCam blinks, letting the driver know an event has been detected and recorded. Video feedback of unsafe driving episodes is combined with a post event parent-teen coaching session after parents review a weekly report card of their teen's driving. This type of documentation builds awareness and fosters communication. This phase will provide four months of feedback.

A DriveCam event recorder will record unsafe driving actions. Abrupt accelerations or braking or erratic steering will trigger the system to record 20-second before-and-after video and audio clips to determine what happens immediately before an incident.

Phase 3 is another four-week baseline period, however, without feedback. Vehicles will have the LED feedback light switched to off and parents will no longer receive information regarding triggered events.

The goal of the study is to determine how brief video events of unsafe driving can be used during "teachable moments" between parents and teens. The hope is that improved safety while driving will result from the communication between parents and their teenage drivers.

Scott Falb, research and driver safety analyst for the Iowa DOT says, "I fully expect the final report and mini-conference included in this proposal to have a positive influence on this state's efforts to improve the graduated driver's license law and to promote improved driver education. I see in this study new possibilities for educating both driver's license examiners and driver education instructors. I see much potential benefit for the area of driver's licensing, but I also see an opportunity for our highway designers and safety engineers to gain greater insight in how younger drivers use (and misuse) the state's roadways."

For more information, contact Scott Falb at 515-237-3154 or scott.falb@dot.iowa.gov.

Self-Consolidating Concrete:

A Viable Option for Slip-Form Paving?

Slip-form paving with self-consolidating concrete (SF SCC) is a step closer to becoming reality. The first field paving test using SF SCC was performed in Ames, Iowa, Aug. 11, 2006.

A modified asphalt paver was used as the SF SCC paver in this test. The paver had no vibration device and was towed by a dump truck. Slump and air content (3 percent) of the concrete mixture were measured at the site. Three cylinders were cast and cured at the site for later strength measurement. When the slump value reached the target value of 7 inches (approximate 45 minutes after mixing), the concrete mixture was loaded into the dump truck and then into the paver.

The dump truck towed the paver forward to form a 34-foot long section of 8 feet wide by 4 inches thick pavement in three minutes. No formwork or vibration was applied during the paving. The pavement had straight vertical edges and a smooth surface, indicating the ability for good concrete flow and for it to hold its shape. The test section will be used as a sidewalk.

The field trial was a collaborative effort by the City of Ames, Manatt's Ready Mix and Iowa State University's Center for Transportation Research and Education (CTRE). This test was a precursor to Phase 2 of the SF SCC pooled-fund study (TPF-5(098)).

New partners are being accepted into Phase 2 of the project. To view video of the tests, visit CTRE's Web site at ctre.iastate.edu/projects/scc.

Major tasks of Phase 2 are:

- evaluate and/or modify existing pavers for SF SCC application;
- trial field construction paving;
- field tests; and
- monitor long-term performance.

Researchers will select one or two pavers and evaluate their suitability (i.e., paving speed and extrusion pressure) for SF SCC paving. The need for surface finishing will be investigated in addition to the time for finishing, texturing, curing, and saw cutting.

A pavement site in Iowa and one or two sites in other states will be selected for the field applications. Besides a standard pavement, an overlay application may be considered. Pavement length, width and thickness, as well as the possibility of deicer applications, will be considered in the field site selection. In-service performance of the field demonstration sites will be monitored and documented at 1, 3 and 5 years.

For more information about this project or the pooled-fund, contact Sandra Larson, director of Research and Technology Bureau, Highway Division, Iowa Department of Transportation, at 515-239-1205 or sandra.larson@dot.iowa.gov.

SF SCC in three phases (top to bottom): performing a slump test, paving the slab, and a next-day look at the completed slab. Note how the vertical edges have held their shape.

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Iowa Department of Transportation

800 Lincoln Way
Ames, IA 50010

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