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NATIONAL TRAFFIC LAW CENTER

Between the Lines

Driver Alcohol Detection System for Safety

By Eric Traube and Susan Ferguson*

The Driver Alcohol Detection System for Safety (DADSS) Program is a research partnership between the National Highway Traffic Safety Administration (NHTSA) and the Automotive Coalition for Traffic Safety (ACTS) to explore the feasibility, the potential benefits of, and the public policy challenges associated with a more widespread use of non-invasive technology to prevent alcohol-impaired driving. For in-vehicle alcohol detection technologies to be acceptable for use among drivers, many of whom do not drink and drive, they must be seamless with the driving task; they must be non-intrusive, that is, accurate, fast, reliable, durable, and require little or no maintenance. Sober drivers who are under the legal limit should not even know they are there. The DADSS program is developing technologies that could prevent the vehicle from being driven when the device registers that the driver's blood alcohol concentration (BAC) exceeds the legal limit (currently 0.08 g/dL throughout the United States). The goal of this 5-year, $10 million initiative, funded jointly by NHTSA and many of the major automakers (BMW, Chrysler, Ford, General Motors, Honda, Hyundai/Kia, Jaguar Land Rover, Mazda, Mercedes Benz, Mitsubishi, Nissan, Porsche, Toyota, Volkswagen, and Volvo) is to have a research vehicle available, by the first half of 2013, that will demonstrate these technologies.

Two approaches have been identified that have considerable promise in measuring driver BAC non-invasively: 1) Tissue Spectrometry, a touch-based approach allowing estimation of alcohol in human tissue, and 2) Distant Spectrometry that will allow assessment of alcohol concentration in the subject's exhaled breath. In the touch-based approach, measurement begins by shining an infrared light on the user's skin (similar to a low power flashlight). A portion of the light scatters several millimeters through the user's skin before returning back to the skin's surface where it is collected by the optical touch pad. This light contains information on the tissue's unique chemical properties which can be analyzed to determine the tissue alcohol concentration. The breath-based approach makes it possible to perform a contact free, unobtrusive measurement of the driver's breath alcohol by using the concentrations of carbon dioxide as a measure of dilution of the exhaled breath of the driver. Multiple sensors placed in the vehicle cabin will allow the system to determine that the breath sample is from the driver and not other passengers.

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Prototype devices have been developed and tested at the laboratories of QinetiQ North America. The testing program was designed to provide an understanding of whether the devices ultimately can meet the performance specifications needed for non-invasive alcohol testing. Bench testing was undertaken to determine the prototypes' accuracy, precision, and speed of measurement and to establish what additional development might be needed. To validate the performance of the prototypes, unique standard calibration devices have been developed for both

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Mark Your Calendars

NDAA Summer Conference
July 17—20, 2011
Sun Valley, ID

NAPC Summer Conference
July 13—15, 2010
Sun Valley, ID

IACP DRE Section's 17th Annual Training Conference on Drugs, Alcohol and Impaired Driving
July 19—21, 2011
Montreal, Canada

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the breath- and touch-based systems that go well beyond current alcohol-testing specifications. Limited human subject testing also permitted an understanding of the relationship among the various measures of blood alcohol provided through blood and breath samples and the breath-based and touch-based prototype devices.

Based on the results of prototype testing, sensors demonstrating both the touch-based approach and breath-based approach are judged to have the potential in Phase II development to measure BAC quickly, and with high levels of accuracy and precision. Significant additional development is needed, but the developers have identified potential technological modifications to the devices that will enable them to meet the DADSS specifications at the end of the Phase II development. Two technology providers have been identified for the Phase II effort: Autoliv Development AB of Vårgårda, Sweden; and TK Holdings who are working with TruTouch Technologies, Inc. of Albuquerque, New Mexico. Phase II development will begin in the first half of 2011.

While the challenges are substantial, the potential benefits to society are compelling. DADSS has the potential to save up to 8,000 lives per year, according to a study conducted by the Insurance Institute for Highway Safety (IIHS). Another study by the IIHS shows that the public may be ready for in-vehicle devices to combat drunk driving. The IIHS research shows that two-thirds of those surveyed considered the use of advanced technology to keep drunk drivers off the roads to be a "good" or "very good" idea.

For more information, visit www.dadss.org.

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2011 WY Governor's Conference on Impaired Driving Features DRE Pioneers

Back row, from left to right: Mark Neil, Chuck Hayes, Tom Page, Dick Studdard; Front row, left to right: Jonlee Anderlee, Erin Inman, Jack Richman, Joanne Michaels, Mike Moore, Don Decker.

The 2011 Wyoming Governor's Conference on Impaired Driving, held May 3—5 in Laramie, Wyoming provided a wealth of information concerning drugged driving and featured training tracks for Prosecutors, Drug Recognition Officers (DRE) and Non-DRE Law Enforcement Officers (ARIDE). Faculty for the conference featured Sgt. Dick Studdard (LAPD Ret.), who along with the late Len Leeds, founded the Drug Recognition Expert Program. Joining Sgt. Studdard were long-time DRE trainers Sgt. Tom Page (LAPD Ret; Chuck Hayes, IACP Regional Coordinator; Don Decker, MA DRE Coordinator; and Dr. Jack Richman, OD. In addition, the faculty included Jonlee Anderlee, WY DRE Coordinator; Mike Moore, WY Chemical Testing Program; Joanne Michaels, National Traffic Law Center, NDAA; Mark Neil, National Traffic Law Center, NDAA; and Erin Inman, MT Traffic Safety Resource Prosecutor.

Technical Assistance

The National Traffic Law Center provides evidentiary and technical assistance on a number of topics in the traffic law realm, tracks national and state legislation, provides training programs on legal issues concerning impaired driving, and a number of other services. This includes an informational catalog on topics related to traffic safety, including expert witnesses, articles and studies, case briefs, case decisions and more. If you are in need of any assistance, please contact the National Traffic Law Center.

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