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VIRTUAL TIRE AND VEHICLE CRASH SIMULATIONS

Presentation by Dr. Moustafa El-Gindy

at

Transportation Development Centre

November 6, 2007 10:00 a.m.

Dr. Moustafa El-Gindy is a Senior Scientist and Director of the Vehicle Dynamics and Simulation Research Center at the Applied Research Laboratory (ARL), and Graduate Faculty in the Department of Mechanical Engineering at the School of Engineering of The Pennsylvania State University. He is also Adjunct Professor in the Department of Mechanical and Industrial Engineering of Concordia University. His previous positions include Senior Research Officer at National Research Council Canada, Scientist at the U.S. Department of Transportation, and Director of the Crash Test Center at Penn State. He is the founder and executive editor of the *International Journal of Heavy Vehicle Systems*. He serves as the chairman of the American Society of Mechanical Engineers (ASME) Vehicle Design Committee.

SUMMARY

Dr. El-Gindy will present an overview of recent research activities in virtual tire and high-speed crash simulation being conducted at the Applied Research Laboratory. He will also briefly describe targeted highway safety research activities, including test and simulation programs undertaken for the Pennsylvania Department of Transportation.

The presentation will also cover the virtual tire simulation and testing program developed during the course of research, together with a virtual tire test machine. Simulation and test methods developed for the truck-driving simulator for driver training and analysis of drivers' interactions with commercial vehicles will be presented. The simulation methodologies for analyses of tire/pavement contact stress distribution based on Artificial Neural Networks approach and DADS will be discussed, together with some results and relative merits of the simulation methods.

Dr. El-Gindy will briefly discuss high-speed crash simulations of different road vehicles. Video clip examples of virtual simulations of crashes involving small cars and pick up trucks with highway signs and barriers will be presented. The session will conclude with a description of ongoing and planned research activities at the Vehicle Dynamics and Simulation Research Centre.

Transportation Development Centre

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