Mohammad Hoque

Peter F. Sweatman

"The deployment of ITS, as part of an infrastructure project, will often unlock a wide range of benefits, including but not limited to safety."—testifies Dr. Peter Sweatman, the director of University of Michigan Transportation Research Institute (UMTRI), while addressing the House Committee on Transportation and Infrastructure during a hearing on "Improving the Effectiveness of the Federal Surface Transportation Safety Grant Programs" in January 2014. Being invited by the subcommittee on highways and transit, Dr. Sweatman provided this expert testimony on behalf of the ITS America and UMTRI.

Dr. Sweatman is a national thought leader in intelligent transportation systems and future mobility for people and freight. He has been serving as the director of UMTRI since 2004. UMTRI is a world renowned institute in the field of transportation safety and sustainability. Under Dr. Sweatman's overall leadership, the world's largest deployment of connected cars, transit buses and freight trucks (the U.S. DOT Safety Pilot Model Deployment) was launched in Ann Arbor in 2012. He is serving as the program committee chair for the largest global meeting on ITS, the 21st ITS World Congress, to be held in the birthplace and home of America's auto industry—Detroit, Michigan.

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UMTRI carries out a large program of transportation systems research spanning drivers, vehicles, communication technology, and the infrastructure. Dr. Sweatman is working to create new research and policy capabilities to address the broader challenges of safety, mobility, energy and greenhouse emissions; he is also helping to develop new research fields assisting the transition from today's automotive industry to the transportation industries of the future. Dr. Sweatman's current research interests include intelligent transportation systems (ITS) and vehicle electrification.

Peter F. Sweatman

Dr. Sweatman served on the ITS America Board of Directors from 2008 to 2013, where he chaired the board during 2012–13. He is currently serving as the Chair of ITS America's Leadership Circle as well as the safety forum. In January 2010 Dr. Sweatman was appointed by Transportation Secretary LaHood to the U.S. Department of Transportation's ITS Advisory Committee. He is a past president of ITS Michigan. He served on the SAE Truck and Bus Council, and as the editor of the *International Journal of Commercial Vehicles*. In 2006, he served on the National Academies Review of USDOT Strategic Plan for Transportation Research and Technology. He is a past member of the Ford Global Citizenship Review Committee.

Dr. Sweatman is an international leader in the scientific field of heavy-vehicle-infrastructure interaction. He is a strong advocate for performance-based standards (PBS) as an improved method for regulating heavy vehicles. His work has been influential in developing truck size and weight evaluation tools for the Federal Highway Administration and the world's first comprehensive PBS regulatory regime for Australia. He chaired the landmark DIVINE study of vehicle-infrastructure interaction for the Organization for Economic cooperation and Development (OECD) and is a past president of the International Forum for Road Transport Technology.

Dr. Sweatman received his PhD in Mechanical Engineering from the University of Melbourne. He came to UMTRI after a successful career in transportation research and development in his native Australia working in both the private and public sectors—and with extensive international experience. He pioneered the scientific evaluation of the impacts of commercial vehicle operation on the highway

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Chapter 5 deals with another significant ITS approach to mitigating nonrecurrent congestion and specifically how to provide motorists adequate information. It provides guidance and some simple models to assist the engineer in locating changeable message signs. The importance of the quality of motorist information is discussed, and a simple evaluation measure is provided. The use of ITS for emergency evacuation is introduced and a model for generating and disseminating information is further provided.

Chapter 6 discusses practices employed by traffic management centers in order to provide information to motorists, when recurrent congestion is experienced, along with the variations in these periods.

The topics covered by chapter 7 include, ramp meter physical installation requirements, ranges of metering rates, the role of ramp metering in creating traffic flow breakdown models, ramp metering strategies and the respective strategy models, ramp storage requirements, ramp queue control strategies and finally a short discussion on ramp metering acceptance by the public.

An overview of freeway ITS communications is provided by Chap. 8. The use of the Open Systems Interconnect (OSI) model and the National Transportation Communications for ITS Protocol (NTCIP) standards are described. The chapter discusses the features of wire-line and wireless technologies, along with the issues of implementing the technologies by utilizing communication service providers or ownership by the operating agency. An example of a communications concept design for a small system illustrates the selection of technology alternatives based on communication reliability and cost.

Chapter 9 describes methods for establishing information pathways among stakeholders. It provides an example of how the flows that are required by a regional ITS architecture may be implemented. The functions of the INFORM Traffic Management Center (a TMC in a major metropolitan area) illustrate the application of the concepts in the chapter.

Utility analysis is discussed again in chapter 10. This chapter describes how evaluation models may be used to estimate benefits and transform them into a monetary format suitable for benefit vs. cost analysis. The discussion includes an example of how the results of the analysis may be effectively presented. Chapter 10 also provides examples of how benefit and cost analysis may be used to recommend a design alternative for implementation.

As the book is accompanied with a CD, which includes worksheets to support several methodologies, the last chapter (chapter 11) serves to identify these worksheets and provide a brief description of their application.

To sum up, *Intelligent Freeway Transportation Systems: Functional Design* is a very good and comprehensive book, as it covers the very important issues a transport engineer has to deal with, during ITS functional design.

ITS

Reviewer: Christos-Nikolaos Anagnostopoulos

Christos-Nikolaos E. Anagnostopoulos was born in Athens, Greece in 1975. He received his Mechanical Engineering Diploma from the National Technical University of Athens (NTUA) in 1998, and the Ph.D. degree from the Electrical and Computer Engineering Dpt., NTUA in 2002.

From 2008, he serves the University of the Aegean as Assistant Professor in the Cultural Technology and Communication Department. He is a member of the Greek chamber of Engineers and member of IEEE. His research interests include image processing, computer vision, neural networks and intelligence transportation systems applications. He has published more than 120 papers in journals and conferences, in the above subjects as well as other related fields in informatics. He also serves as associate editor for the *IEEE Intelligent Transportation Systems Magazine*.

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system and provided new analytical tools for dealing with the socioeconomic issues associated with road freight transport. Dr. Sweatman was elected to the Australian Academy of Technological Sciences and Engineering in 1997, and was awarded the Centenary Medal in 2002 by the Prime Minister of Australia for service to Australian society in transportation engineering. He was named Australian Freight Industry Personality of the Year in 2004.

Dr. Sweatman's research has crossed the boundaries of traditional engineering disciplines and his work has been widely recognized in the fields of vehicle design and engineering, vehicle safety, road safety, driver performance, highway condition monitoring, heavy vehicle standards and regulations, and transport economics and policy. He has a strong interest in advanced safety systems which help drivers to avoid crashes, and in communication technology which will not only prevent crashes but also improve traffic flow.

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