

Traffic Flow Theory and Characteristics Committee (AHB45)
2014 Summer Meeting - August 11-13, 2014 - Portland, Oregon USA
Symposium Celebrating 50 Years of Traffic Flow Theory

*Statement about my experience working with the committee during many years
and provision of some reflections on the past and future of traffic theory*

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As one of the international long year members of the Traffic Flow Theory and Characteristics Committee and a long year head of the German counter-part I want to express my sincere congratulations to 50 years of traffic flow theory.

I remember the ancestors of this committee like Bob Herman, a former researcher at GM, who started investigations of car following behavior by distance measurements of a vehicle in a platoon with a thread winded on a coil and connected with the preceding vehicle, or the analysis of "Traffic Dynamics by Aerial Photogrammetry Techniques" by Joseph Treiterer and Jeffrey A. Myers from Ohio State University. All this pioneering work of traffic flow description and traffic pattern formation was based on the ideas of Bruce Greenshields, who firstly found the terms and definitions of "traffic density", "traffic flow" and "(mean) speed" and the corresponding measuring instructions now more than 80 years ago. It was therefore an utmost concern of the committee to celebrate Greenshields' legacy and the committee did it in an honorable way with a midyear meeting in Woods Hole (Mass.) in 2008 commemorating 75 years of Greenshields' famous publication. The imposing success started a series of midyear meetings, which now take place in a bi-annual sequence. After the Greenshields Symposium, Woods Hole, MA, 2008, "Does Traffic Data Support Traffic Models?", Annecy France, 2010, and Symposium on Innovations in Traffic Flow Theory and Highway Capacity and Quality of Service, Fort Lauderdale, FL, 2012, and now in 2014 the celebration of the 50th anniversary of the committee in Portland, Oregon.

The observation during my time working with the committee is the trend away from macroscopic modelling towards microscopic simulation because of the enormously increased capacity of computer power. Another trend is based on the influence of modern communication technology and driver assistance systems on traffic pattern formation. Especially the applications of short range communication technology connecting vehicles among each other and with the infrastructure facilities enables new traffic control possibilities and opens new challenges for traffic flow description and modelling. Co-operative driving with data exchange concerning braking actions, crash sensor data, steering maneuvers, windscreen wiper positioning, and warning light positioning will shape the traffic of the future and redesign the requirements of traffic flow theory. The airbag sensor technology will provide us with high quality approach data.

Does traffic flow theory give answers to the way in which rapid and safe data transfer has to be organized with prioritization of surrounding vehicles that are to be included?

It is already clear, that the active distance warning equipment will enhance the knowledge of distance and speed and give support for measurements in the "vehicle to vehicle" context.

From “vehicle to infrastructure” communication such as automatic tolling and roadside warning systems destination data can be derived (vehicle probe or floating car data). These data find their way into traffic signal pre-emption and operating condition checks of computer-aided operating control systems for transit - an alternative to floating car data via mobile telephone. Traffic flow theory can help for the design of safe data transfer including vehicle classification and identification as well as for the design of displays showing hazardous conditions based on multi-factorial interpretation of actively transmitted vehicle data. The multi-factorial analysis links the data of the vehicle to infrastructure communication with wheel revolution counter and odometer data.

One of the invaluable merits of the committee is the initiation of the “Traffic Flow Monograph” edited by the Federal Highway Administration. This basic compendium is a terrific support for academia and practitioners. It helps even in the present form to answer questions about simulation of traffic systems, emissions reduction through better traffic management, empirical evaluation based upon on-road measurements, and incident management in intelligent transportation to name a few. It will be exiting to look forward to a new edition answering some of the above-explained challenges.

The stimulations to the Highway Capacity Manual are numerous and not to underestimate. Sharing the ideas with representatives of well-respected Universities from the U.S. and Canada is always an enrichment of working with the committee and therefore I wish the committee a bright future and much more years of inspiring work- ad multos annos!