

Highway Safety Performance Newsletter

Newsletter of the TRB Highway Safety Performance Committee (ANB25)

First Quarter 2012

Issue III

Partnerships for Success

The ability to create change in highway safety cannot occur without the assistance and cooperation of a number of safety organizations. Our committee has been very fortunate in carrying out its mission because of these combined efforts. We continue to remain encouraged by the strong leadership from FHWA as we continue implementation of the HSM. In addition, AASHTO and member states are emphasizing and encouraging the use of quantitative methods in highway safety and also providing a strategic safety plan that moves us closer to our combined goals. The National Academies and TRB/NCHRP commitment has been outstanding as TRB/NCHRP has provided the mechanism and ability to complete national level research, hold workshops, and develop training and educational materials. Finally, we thank the partners, committee members, and friends for their time and effort to support the nation's Toward Zero Death Vision.

John Milton, Chair

FHWA has been working very closely with AASHTO, TRB, and researchers across the nation to develop training, guidance, and other tools that will assist states with the many facets of HSM implementation. FHWA has released a series of important publications that meet various needs for the states.

The **HSM Training Guide** focuses on identifying HSM training courses currently available through NHI, FHWA and ITE for state and local agencies that are considering implementation of the HSM, as well as identifying additional HSM related courses under development. It also includes a description of key focus groups that may find value in HSM training as well as various training delivery methods and how that may add value to various learners. Visit www.safety.fhwa.dot.gov/hsm/training for more information.



The **HSM Implementation Guide for Managers** is written for managers of DOTs charged with leading and managing various programs related to the project development process and safety programs. It outlines what the HSM is (and is not), how it 'fits' with other core technical documents and policies, and what the potential benefits of its use can be. Visit www.safety.fhwa.dot.gov/hsm/hsm_mgrsguide/ for more information

The **HSM Applications Guidebook**, which is scheduled for a February 2012 release, is a planning level tool for state and local agency practitioners seeking to implement and institutionalize the HSM. The Guidebook is intended to help practitioners understand how the HSM can be used in many disciplines and stages of project development to enhance and add value to the entire process.

FHWA has developed several **HSM case studies** that describe how the HSM methodologies have been applied in Idaho, Ohio, and Florida. For example, Idaho used predictive methods to perform a transportation study on an eleven mile corridor; Ohio is implementing a new roadway safety management process using *SafetyAnalyst* which supports Part B of the HSM; and Florida used the HSM's crash prediction methodologies to select an alternative on a four-lane divided highway.

These important **resources** together are intended to support HSM deployment and help ensure successful implementation by providing tailored guidance to the appropriate stakeholders at all levels of government. All of these materials can be found on the FHWA safety web site at safety.fhwa.dot.gov/hsm/ or the AASHTO HSM web site at www.highwaysafetymanual.org. For more information about this and other ongoing HSM implementation efforts by FHWA, contact Mshadoni Smith at mshadoni.smith@dot.gov.

Pooled Fund Study for HSM Implementation

FHWA is also serving as the lead agency for the Pooled Fund Study for HSM Implementation (TPF5-255) (www.pooledfund.org/Details/Study/484) The objectives of the study are (1) to advance ongoing efforts by lead states to implement the HSM, and (2) to expand implementation to all states. Thirteen states are currently participating in the four year

study which remains open for other states to join. For questions about the pooled fund study, contact Esther Strawder, FHWA at esther.strawder@dot.gov.

Upcoming FHWA Courses

- HSM Overview (1-day) - Summer 2012
- IHSDM Web-based Training (NHI 380100)- Fall 2012
- HSM Web-based Training (NHI 380106) - Feb. 2012
- HSM Roadway Safety Management Process - Fall 2012
- HSM Lite: Local Agency focus (1/2 day)- Fall 2012.

For more information about FHWA training opportunities, visit www.fhwa.dot.gov/resourcecenter/teams/safety/courses.cfm. For information about NHI courses, contact Tom Elliott at Thomas.Elliott@dot.gov.

AASHTO

continues with its efforts to support implementation of the HSM. Specific efforts are taking place as part of the Subcommittee on Highway Traffic Safety Management (SCOHTS) Strategic Plan — Goal 2: Highway Safety Manual). The AASHTO SCOHTS Strategic Plan is available at scohts.transportation.org/Documents/About/SCOHTS%20Strategic%20Plan%20June%202011.pdf for more information).

For questions, please contact Kelly Hardy, AASHTO at Kelly.Hardy@aaashto.org; and on Goal 2 of SCOHTS, Priscilla Tobias, IDOT, Chair of Working Group 2 at Priscilla.Tobias@illinois.gov.

A New Crash Cost Application Tool

In the current economic reality of reduced revenues and limited budgets, state agency decision makers are challenged to justify the cost and demonstrate the effect—hard dollar figures—of program initiatives and their consequences. For State DOTs, whose mission is to improve the safety of its roadways for their users, this means identifying safety improvements and providing data supporting the cost and anticipated benefits of these improvements.

National Cooperative Highway Research Program (NCHRP) Project #20-24 (068), conducted by NAVIGATS Inc., Geni Bahar, P.Eng., P.E., developed a crash cost application tool. This tool functions as a simple calculator to assist State DOTs in estimating the crash costs to their specific state when focusing on relevant target crash types and maximum crash severity injury level.

The calculator offers a selection of site and safety attributes for your study location—posted speed limit, geometry/traffic control for a segment, or signalized or unsignalized, and target crash types and maximum crash severity-injury level. It's simple to use: make your selections and enter the relevant crash frequency; the tool calculates the current crash costs and the future safety effect of potential treatment(s) once implemented. It's compatible with the 2010 AASHTO *Highway Safety Manual* and applies Crash Modification Factors (CMFs).

The tool can be downloaded from the AASHTO Subcommittee on Safety Management's Safety Portal: usroadsafety.com/crash-cost-calculator. The webpage provides more information about the tool, including: crash cost components, crash cost types, and crash categories. For questions, please contact Geni Bahar at genibahar@navigats.com.

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Follow us on **twitter** and find us on **Facebook** (links are provided on our website).

Contact Us

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Up for Discussion – Jim Bonneson

A question has been raised about the correct characterization of the crash frequency estimates obtained from the predictive method. The debate among some members of TRB's Highway Safety Performance committee is whether the crash frequency estimates from the predictive method should be referred to as: predicted average crash frequency (PACF), or expected average crash frequency (EACF). The terms "predicted" and "expected," as used above, are at the heart of this debate. The application of this terminology in Part C of the HSM has been interpreted differently among members and friends.

Method-Based Terminology. Some members believe that the terms used to describe the estimates obtained from the predictive method are based on whether the EB Method was used in the predictive method. Their interpretation is described as follows: (a) If the EB Method was used, then the estimates obtained are EACFs.; and (b) if the EB Method is not used, then the estimates obtained are PACFs. The basis for the method-based terminology is to communicate the relative reliability of the estimate, with the EACF being more reliable than the PACF.

Unified Terminology. Other members of the committee believe that the terms used to describe the estimates obtained from the predictive method are described as follows: The estimates obtained are EACFs.

The intent of this simpler terminology is to be consistent with the broader community of engineers and scientists in the use of terms describing mathematical expectation. The phrase "expected value" is general in its meaning. It is the long-run average of the results of many independent repetitions of an experiment (e.g., a dice roll). The phrase "predicted value" is specific in its meaning. It is the expected outcome of the next test, experiment, or trial. It is a forecast using the expected value of the outcome of past tests, experiments, or trials.

The following three key references from the 2010 HSM are fundamental to the question being addressed in this paper. The citation corresponds to the location of their occurrence in the introduction to Part C of the HSM; however, the references are repeated in Chapters 10, 11, and 12.

"The result from the predictive method is the expected average crash frequency, N_{expected} . This is an estimate of the long-term average crash frequency that would be expected, given sufficient time to make a controlled observation, which is rarely possible." (HSM, p. C-4)

"In the HSM, predictive models are used to estimate the predicted average crash frequency, $N_{\text{predicted}}$, for a particular site type using the regression model developed from data for a number of similar sites." (HSM, p. C-4).

"If observed crash frequency data are not available, then Steps 6, 13, and 15 of the predictive method would not be performed. In this case, the estimate of expected average crash frequency is limited to using a predictive model (i.e., the predicted average crash frequency)." (HSM, p. C-8).

These statements are consistent with the definitions of predicted and expected that are understood by the community of engineers and scientists. They are logical. In combination, the three statements imply that, if crash data are not available and the EB Method is not used, then the predicted average crash frequency from the predictive model is the *best available estimate* of the expected average crash frequency. In contrast, the only place in Part C where the estimate from the predictive method is described as a "predicted average crash frequency" is in the first three or four sample problems of Chapters 10, 11, and 12. In contrast, the remaining sample problems in each chapter use the phrase "expected average crash frequency" to describe the estimate from the predictive method.

In summary, Part C of the HSM follows the Unified Terminology approach described at the start of this paper. In this regard, it consistently describes the estimates from the predictive method as "expected average crash frequency," regardless of whether the EB Method is used. One exception to this observation is that some of the sample problems use the Method-Based Terminology. Anyone reading the HSM will likely believe that the predictive method produces an estimate of the expected average crash frequency.

This topic will be part of the discussions of the committee's Wednesday meeting (01/25/11). Refer to p.4 for more information about our sessions and meetings.

A Letter from the Chair

Welcome to the 91st Annual TRB meeting. It will be nice to see all of you again. This year, as in the past, *Highway Safety Performance* has been particularly busy as a committee.

At the Annual meeting, we will continue to move forward on the Committee's strategic plan, introduce new chapters for potential inclusion in the *AASHTO Highway Safety Manual*, and hold two podium and a poster session. Our efforts to increase the use of quantitative methods in safety performance evaluations has been quite successful.

This year we saw an increase in our paper reviews with 35 papers submitted, of which 24 will be presented. The podium sessions on HSM implementation and new developments in highway safety research offer great opportunity to see the current state of the practice and art for safety. The newsletter contains more detailed information on these and the rest of our activities on p. 4.

Our committee continues to reach out and expand our partnerships with other TRB Committees and Safety Organizations. This year we have invited members from *Local/Tribal Technical Assistance Program (LTAP)* to our committee meetings in an effort to grow our outreach to transportation professionals at all levels.

Have a great TRB and safe travels home.

John Milton

Chair of the Highway Safety Performance Committee (TRB ANB25)

Highway Safety Training Synthesis/ Roadmap – NCHRP 7-20(290)

The NCHRP 7-20(290) project report is now available at usroadsafety.org. It presents a roadmap for safety practitioners and identified gaps in training. The project also reviewed available training courses and created a centralized and accessible source of information about available training in safety. For questions about the project and products, please contact Geni Bahar at genibahar@navigats.com.

Getting Involved in the Committee

Our committee relies on members and friends to assist with our activities. Please contact our chair at miltonj@wsdot.wa.gov, any of the officers or listed below if you would like to support the activities of TRB ANB25. You can also sign up as a friend of the committee at our website (safetyperformance.org).

Chair: John Milton, WSDOT, miltonj@wsdot.wa.gov
Secretary: Beth Wemple, Cambridge Systematics, ewemple@camsys.com
Communications Coordinator: Ida van Schalkwyk, CH2M HILL, ida.vanschalkwyk@ch2m.com
Conferences and Meetings Subcommittee: John Nitzel, CH2M HILL, john.nitzel@ch2m.com

Crash Modification Factors Subcommittee: Karen Dixon, Oregon State University, karen.dixon@oregonstate.edu
Highway Safety Management Subcommittee: Doug Harwood, MRI, धारwood@mriresearch.org
Policy and Legal Aspects Subcommittee: Bre Gowan, bcgowan@hotmail.com

Predictive Methods Subcommittee: John Ivan, University of Connecticut, John.ivan@uconn.edu
User Liaison and Technology Facilitation Subcommittee: Geni Bahar, NAVIGATS, Inc., genibahar@navigats.com

Enhanced Safety Prediction Methodology and Analysis Tool for Freeways and Interchanges

Project Schedule: May 2009 to November 2011

State highway agencies, and others responsible for road systems, do not currently have useful methods for predicting the safety effect of design and operational decisions for freeway and interchange projects. In contrast, safety prediction procedures have been developed for rural two-lane highways, rural multilane highways, and urban and suburban arterials. They have been included in the first edition of the *Highway Safety Manual (HSM)*. This project was charged with developing an enhanced safety prediction methodology and supporting analysis software for evaluating freeways and interchanges. The research products include: (1) development of a draft chapter suitable for inclusion in the *HSM* and (2) documentation of the methodology at a level of detail sufficient to support its inclusion in the Interactive Highway Safety Design Model (IHSDM).

The safety prediction methodology developed for Project 17-45 is able to address a wide range of freeway and interchange conditions, such as: freeway-freeway (i.e., system) and freeway-crossroad (i.e., service) interchanges; freeway and interchange facilities in urban and rural areas; and crossroad ramp terminals that are signalized or two-way stop controlled.

The temporal scope of the methodology is also broad to the extent that it includes procedures for evaluating the safety of a freeway system for a single year or a specified analysis period consisting of several consecutive years.

The methodology supports the following types of design decisions: interchange spacing; interchange and ramp configuration (e.g., ramp type, location, radius, over or underpass, etc.); and arrangement of ramps (e.g., successive entrance ramps, weaving section vs. C-D road, etc.).

The research approach consisted of two phases. During the first phase, information was gathered and used to develop an overall framework and plan to develop the methodology. During the second phase of the project, the methodology was developed, tested, and refined. It was documented as a draft HSM chapter for freeways and a draft HSM chapter for ramps. To facilitate implementation, the methodology was automated in software, and workshop training materials were developed. For questions about the project, please contact Jim Bonneson, Kittelson & Associates, Inc. at jbbonneson@kittelson.com.

NCHRP 17-50: Lead States Initiative for Implementing the Highway Safety Manual

The objectives of this project are to provide technical assistance to facilitate the implementation of the Highway Safety Manual (HSM) and to develop an HSM User Guide based on the experiences and examples of the lead states to assist other highway agencies in implementing the HSM. The User Guide will serve as a supplement or companion to the HSM and show practical approaches to implementing the HSM procedures in the operating environment of a highway agency. For questions about the project, please contact Kim Kolody Silverman, CH2M HILL at Kim.Kolody@CH2M.com.



Extended Spreadsheets to support training and implementation of the HSM

During 2009 and 2010, Dr. Karen Dixon, Principal Investigator of NCHRP 17-38, developed three spreadsheets in a volunteer effort to support training efforts on the first edition of the HSM. The extended Highway Safety Manual (HSM) predictive analysis spreadsheets represent updates to these three spreadsheets.

The update was funded through a partnership between the Alabama Department of Transportation and Virginia Department of Transportation. These agencies are releasing these tools for use by other individuals and agencies to support the implementation of the HSM across the nation.

The extended spreadsheets, along with instructions and a presentation file for use with training can be downloaded at safetyperformance.org.

For questions about the original spreadsheets, please contact Karen Dixon at Karen.dixon@oregonstate.edu; and for questions about the extended spreadsheets, please contact Ida van Schalkwyk at ida.vanschalkwyk@ch2m.com.

FHWA Crash Modification Factor Clearinghouse

The *Crash Modification Factors (CMF) Clearinghouse* offers transportation



professionals a central, Web-based repository of CMFs, as well as additional information and resources related to CMFs. The database is constantly updated as new publications become available. You can now submit your CMFs to the Clearinghouse or specific research needs for CMFs at the site.

The Clearinghouse published *A Guide to Developing Quality Crash Modification Factors*. It can be downloaded under Resources > Publications. For additional information, visit www.cmfclearinghouse.org or contact Karen Yunk at karen.yunk@dot.gov.

The Roadway Safety Data Partnership (RSDP)

The RSDP is a collaborative effort between FHWA and states to develop "robust data-driven safety capabilities" (safety.fhwa.dot.gov/rsdp/index.cfm). The midpoint report for the RSDP is now available, presenting preliminary findings and lessons learned. The PDF is available online at the project website: safety.fhwa.dot.gov/rsdp/downloads/RSDP_midpointtrpt.pdf (FHWA-SA-12-014). The project site also provides a fact sheet for agencies that outlines the benefits to states, scope and timeframe, and the role of each of the partners (safety.fhwa.dot.gov/rsdp/downloads/RSDP_State_Flyer.pdf). If you have questions, you can contact Heather Rothenberg, FHWA at Heather.Rothenberg2@dot.gov or submit questions online at safety.fhwa.dot.gov/rsdp/questions.cfm.



COLLECTING • ANALYZING • MANAGING • EXPANDING

User Liaison and Technology Facilitation (ULTF) Subcommittee – JOIN US!!!!

The ULTF has been in existence since the formation of the Task Force in 2000. We have developed user surveys, user databases, presentations, briefings, articles, chapter reviews and attended numerous events to reach out to potential users of the future Highway Safety Manual.

Since the publication of the HSM, the members of the ULTF have revised their scope and mission for the next few years. Our scope is to promote the institutionalization of the state of the art of quantitative highway safety information into professional practice; and this will be demonstrated by the widespread understanding and effective application of the fundamentals of highway safety. Our mission includes coordinating our efforts with other subcommittees, with the Highway Safety Performance Communication Coordinator, with other TRB Committees, and with users of HSM. One of our key activities consists of the facilitation of understanding and application of HSM procedures by promoting the use / adoption of quantitative safety information practices and procedures.

The ULTF subcommittee has launched an effort to reach out to TRB Committees and Task Forces on a very far-reaching manner. We have identified a great number of committees that we would like to establish close liaison for future collaborations. When approaching these committees, we aim to:

- Market the HSM for use by all.
- Advance the general knowledge about safety performance.
- Establish permanent link with the HSP Committee (have a liaison person).
- Inform about progress at both committees by an active member or friend.
- Participate in the research statements for inclusion of sound CMF development, whenever relevant.

Several dedicated members of the ULTF have approached Committee and Task Forces' Chairs and their presentations were included in the agendas of the TRB Annual Meetings in January 2011.

In May 2011, the ULTF invited relevant TRB Committees and Task Forces Chairs and interested members to attend a web-session to continue this outreach effort. Close to 100 registered and attended the web-session (the taped presentation can be downloaded from safetyperformance.org). The ULTF has established formal liaisons with several committees and task forces and look forward to strengthen these relationships during the upcoming 2012 meeting and beyond.

The ULTF has also reached out to LTAP and will explore joint initiatives during the meetings in January 2012. The ULTF continues to work closely with AASHTO and FHWA to establish strong safety initiatives.

Our work is totally depended on the enormous efforts by the many volunteers who share so much of their knowledge, experience and passion for the dissemination of highway safety. The ULTF Subcommittee invites all that are interested in any aspect of our efforts to join our meetings, and for more information contact Geni Bahar at genibahar@navigats.com.

Online resources

AASHTO's Highway Safety Manual Website: www.highwaysafetymanual.org
HSM User Discussion Forum: register and access through www.highwaysafetymanual.org
FHWA HSM Page: safety.fhwa.dot.gov/hsm

FHWA Crash Modification Factor Clearinghouse: www.cmfclearinghouse.org
TRB ANB25: www.safetyperformance.org
SafetyAnalyst: www.safetyanalyst.org
IHSDM: www.ihsdm.org & IHSDM.support@fhwa.dot.gov
NHI: www.nhi.fhwa.dot.gov

FHWA Resource Center: www.fhwa.dot.gov/resourcecenter/teams/safety/courses.cfm
AASHTO Subcommittee on Safety Management (SCOHTS) Safety Portal: www.usroadsafety.org
AASHTO SCOHTS Strategic Plan: scohts.transportation.org/Documents/About/SCOHTS%20Strategic%20Plan%20June%202011.pdf

Committee Activities at the 91st Annual Transportation Meeting, January 2012

Our committee will have two committee meetings and several subcommittee meetings during the Annual Meeting:

- Committee Meeting I on Wednesday from 2:30PM- 6:00PM (Marriott, Wilson A)
- Subcommittee meetings on Wednesday from 7:30PM- 9:30PM (Refer to the list of subcommittee meetings for meeting location information)
- Committee Meeting II on Thursday 8:00AM- 12:00PM (Virginia A & B).

We are sponsoring and co-sponsoring three sessions:

- Highway Safety Performance - Jan 24 2012, 7:30PM- 9:30PM (Marriott, Salon 2) - Session 648
- New Developments in Highway Safety Research - Jan 25 2012, 8:00AM- 9:45AM (Marriott, Maryland B) - Session 679
- Implementation of AASHTO Highway Safety Manual: What Is Under Way? - Jan 25 2012, 10:15AM- 12:00PM (Marriott, Maryland B)

Committee Meeting I:

Wednesday PM – 2:30PM- 6:00PM (Marriott, Wilson A)

An afternoon where the committee will focus on the development and refinement of the Strategic Plan of the Highway Safety Performance Committee, and reports on ongoing safety performance activities:

- FHWA: CMF Activities, the HSM Implementation Plan, and the Performance Management Project (Setting Safety Performance Targets)
- NCHRP 20-7(314): Recommended Protocol for Developing Crash Modification Factors
- NCHRP 17-45: Enhanced Safety Prediction Methodology and Analysis Tool for Freeways and Interchanges
- NCHRP 17-48: Highway Infrastructure and Operations Safety Research Needs
- LTAP Status of current safety activities and efforts to improve safety performance

Subcommittee Meetings:

Wednesday 7:30PM- 9:30PM

Anyone is welcome to attend. Each of the subcommittee meeting locations are listed below:

- **Conferences and Meetings Subcommittee**, ANB25(4) (Marriott, Balcony A)
- **Crash Modification Factors Subcommittee**, ANB25(6) (Marriott, Harding)
- **Highway Safety Management Subcommittee**, ANB25(7) (Marriott, Coolidge)
- **Policy and Legal Aspects Subcommittee**, ANB25(1) (Marriott, Hoover)
- **Predictive Methods Subcommittee**, ANB25(2) (Marriott, Wilson A)
- **User Liaison and Technology Facilitation Subcommittee**, ANB25(3) (Marriott, Wilson B & C)

Committee Meeting II:

Thursday 8:00AM- 12:00PM (Virginia A & B)

The committee meeting continues with a discussion of technical matters, followed by the Committee Business Meeting.

The presentations will include:

- The use of Part D CMFs in conjunction with Part C analyses
- Whitepaper Discussion: Predicted versus Expected
- Highway Safety Research Proposals : 2011 Project Submittals, Future Research Proposals
- NCHRP 17-51 Towards Zero Deaths: A National Strategy on Highway Safety (Update on Progress)

During our business meeting subcommittees report back, motions are offered, the committee receives updates from NCHRP and TRB, etc. Anyone is welcome to attend and voting is limited to TRB ANB25 members.

Session: Highway Safety Performance - Jan 24 2012, 7:30PM- 9:30PM (Marriott, Salon 2) - Session 648

Crash Modification Factors: Foundational Issues (12-0326) - B01— Hauer, Bonneson, Council, Srinivasan, and Zegeer.

Relationship Between Freeway Flow Parameters and Safety and Its Implication for Adding Lanes (12-0702) - B02; Kononov, Reeves, Durso, and Allery.

Crash Modification Factor for Inexpensive Yet Very Cost-Effective Safety Improvement: Converting Undivided Four-Lane Urban Roadways to Five-Lane Roadways (12-0853) - B03: Sun, Das, Fruge, Bertinot, and Magri.

Issues Related to Combination of Multiple Crash Modification Factors (12-1652) - B04; Gross, Hamidi, and Yunk.

Suggestions on How Agencies Should Apply the Highway Safety Manual to Two-Lane Road Curves (12-0011) - B05; Zegeer, Sundstrom, Hummer, Rasdorf, and Findley.

Crash Modification Factors for Changing Left-Turn Phasing (12-2521) - B06; Srinivasan, Lyon, Persaud, Baek, Gross, Smith, and Sundstrom.

Effect of Variations of Crash Modification Factors on Predicted Frequency on Rural Two-Lane Highways: Sensitivity Analysis (12-0450) - B07; Alluri, and Ogle.

Assessing International Transferability of Highway Safety Manual Crash Prediction Algorithm and Its Components (12-0190) - B08; Sacchi, Persaud, and Bassani.

Effects of State-Specific Safety Performance Functions, AADT Estimations, and Overdispersion Parameters on Crash Predictions Using SafetyAnalyst (12-4332) - B09; Alluri and Ogle.

Identifying High-Collision Locations Without Traffic Volume Data (12-1424) - B10; Sahaji, Park, Eguakun, and Gardiner.

Calibration of Highway Safety Manual Safety Performance Function and Development of New Models for Rural Two-Lane Two-Way Highways (12-0972) - B11; Brimley, Saito, and Schultz.

Developing a Regional Safety Performance Function for Rural Two-Lane Highways (12-4549) - B12; Bornheimer.

Developing Crash Modification Factors for Interchange Influence Areas on Urban Four-Lane Freeways Using Multivariate Adaptive Regression Splines (12-2378) - B13; Haleem, Gan, and Lu.

Calibration of Highway Safety Manual Prediction Method for Rural Kansas Highways (12-2835) - B14; Lubliner and Schrock.

Comparing Locally Calibrated and SafetyAnalyst-Default Safety Performance Functions for Florida's Urban Freeways (12-4730) - B15; Lu, Gan, Haleem, Alluri, Liu.

Crash Frequency Analysis for Urban Expressways by Considering Segment Type (12-1965) - B16; Tu, Zhang, Yang, and Chen.

Estimation of Safety Effectiveness of Composite Shoulders on Rural Two-Lane Highways (12-4550) - B17; Zeng and Schrock.

Comparing Highway Safety Manual Predictive Method to Traditional Ranking Methods: Case Study of Intersections in Corvallis, Oregon (12-4070) - B18; Zhou and Dixon.

Crash Reduction Effects of Flashing LED Stop Signs (12-3794) - C01; Xiong and Davis.

Injury Outcomes and Costs for Cross-Median, Median Barrier, Median Entry, and Run-off-the-Road Crashes (12-4485) - C03; Coburn, Chitturi, Bill, and Noyce.

Horizontal Curves, Signs, and Safety (12-4564) - C05; Khan, Bill, Chitturi, and Noyce,

Safety Performance of Freeway Operational Parameters (12-4677) - C07; Daniel.

Developing Lane-Width Crash Modification Factors for Urban Multilane Roadways with Curb-and-Gutter and Asymmetric Lanes (12-0076) - C09; Mbatia, Sando, and Moses.

Highway Safety Manual, Calibration Data Set Sensitivity Analysis (12-1370) - C11; Banihashemi.

Session: New Developments in Highway Safety Research - Jan 25 2012, 8:00AM- 9:45AM (Marriott, Maryland B) - Session 679

Enhanced Safety Prediction Methodology and Analysis Tool for Freeways and Interchanges (P12-6512); Bonneson.

Input to Development of the National Highway Safety Strategy (P12-6513) Van Schalkwyk and Potts.

Recommended Protocol for Developing Crash Modification Factors (P12-6514); Carter.

Consideration of Roadside Features in the Highway Safety Manual: Progress Report (P12-6515); Ray.

Session: Implementation of AASHTO Highway Safety Manual: What Is Under Way? Jan 25 2012, 10:15AM- 12:00PM (Marriott, Maryland B) - Session 721

Overview of Lead States Initiative and Peer Group Effort (P12-6516); Kolody Silverman.

Progress to Date:

- Ohio DOT (P12-6517) (Hughes).
- New Hampshire DOT (P12-6518) (Thompson)
- Washington State DOT (P12-6519) (Milton)
- Virginia DOT (P12-6520) (Reed)
- Florida DOT (P12-6521) (Santos).

About the Committee

The TRB Highway Safety Performance Committee (ANB25) is committed to the advancement, integration and institutionalization of quantitative highway safety information to support transportation decision-making at all levels. The function of the committee is to foster the continual development, validation and increased knowledge of science-based methods, procedures and measures that will increase the safety performance on the nation's highways and roadways.