Transportation Research Board
Committee on Traffic Flow Theory and Characteristics (AHB45)
DRAFT Triennial Strategic Plan (TSP) 2015–2018

Committee Future Outlook Statement (CFOS)

The TRB Committee on Traffic Flow Theory and Characteristics (TFTC) serves as an unbiased focal point for promoting the development and improvement of sound theoretical, experimental and applied foundations of traffic flow phenomena; validation, dissemination and application of traffic flow theories in the planning, design and operation of multimodal transportation systems; and the study of traffic flow characteristics and the application of this knowledge in the planning, design, operation and maintenance of surface transportation systems. This knowledge provides the foundation for a range of operational interventions, including those that entail novel applications of advanced sensing and communication technologies, targeted at reducing congestion, improving flow quality and safety, and reducing the carbon impact of vehicular traffic.

Our scope includes vehicular highway traffic of all kinds (passenger, freight, fleets, transit, bicycles, etc.), pedestrians and crowds, as well as systems with interactions among several modes sharing the right of way. We advocate the collection and dissemination of rigorous empirical transportation data sets describing observed traffic characteristics as the basis for sound theory, modeling and simulation. We are inclusive in welcoming participants to our activities, and we actively collaborate with other international organizations to lead the development of intellectual and human capital in traffic flow theory and characteristics, including education and training. We embrace innovative outreach mechanisms including the internet and social media, and we remind scholars, professionals and future leaders of the rich history of this field. We promote excellence in research with the Greenshields Best Paper Award and actively participate in nominating high quality papers for the TRB-wide outstanding paper awards including the Fred Burggraf Award for early researchers.

The TFTC committee also takes a leadership role in advocating for the sound development and application of traffic simulation modeling tools, through our Joint Subcommittee on Traffic Simulation. This includes calibration, validation, interpretation and application procedures for traffic models and related tools, as well as guidelines and identification of misuse.

The committee takes a leading role in identifying challenges and opportunities affecting traffic flow, including developments in intelligent systems, connected vehicles, and automated vehicles in the traffic stream.

Committee Plan (CP)

Primary Activities

- Serve as focal point for high-quality, unbiased research, presentations, workshops, and publications in the areas of traffic flow theory and characteristics
- TRB Annual Meeting sessions, committee and subcommittee meetings and TRR publications will serve as primary venue
- Coordinate annual and mid-year activities with other TRB committees.

- Regularize post-annual meeting webinars of presented papers (began in 2011 via Georgia Tech webinar series).
- Hold 2015 mid-year meeting in conjunction with the 21st ISTTT, Kobe, Japan.
- Hold 2016 mid-year meeting in summer of 2016 in Gold Coast, Australia.
- Hold 2017 mid-year meeting in conjunction with the 22nd ISTTT, Chicago, IL.
- Hold TRB Sunday workshops on contemporary and emerging topics in traffic flow theory.
- Consider targeted calls for papers for TRB annual meeting based on critical issues or topics identified at mid-year meeting (e.g. international, mixed traffic, connected systems, autonomous vehicles, evacuation, etc.)
- Continue close cooperation with government, industry, university, scientific and professional organizations in conferences, symposia and workshops devoted to traffic flow theory and characteristics and their application.
- Continue partnerships with international organizations such as INFORMS, ITSA, ISTTT, ISTS, NEARCTIS, MULTITUDE, TRISTAN and the physics community in order to maintain unique global position of respect in this field.
- Promote educational materials for innovative ways of learning traffic flow theory to engage students, transportation agencies, politicians, and the public.

Committee Management and Membership

- Continue to increase membership gender/racial, geographical, and organizational diversity, particularly with addition of state DOT and other governmental agency representatives. We currently have 15 women/minorities and we plan to focus on appointing more in the coming years. Our organizational diversity needs to expand beyond the current academic focus.
- Continue to develop strategic liaison with Freeway Operations Committee and state DOTs.
- Develop strategic liaison with standing committees related to security and emergencies (e.g., new Task Forces on Emergency Evacuation, and Logistics of Disaster Response and Business Continuity), energy, multimodality, environment, and urban sustainability.
- Develop a subcommittee on automated/connected vehicles.
- Focus and grow permanent sub-committee activities.
- Shift website to more modular and distributed format.
- Actively grow Greenshields Prize into a sought-after award, consider a new award for high quality theory-focused and modeling papers, and a young author award.
- Anticipate traffic flow theory and characteristics research needs that support national priorities such as safety, livability, environmental sustainability, state of good repair and economic competitiveness
- Remain vigilant in addressing global priorities including traffic management, congestion mitigation, emergency response and evacuation, urban sustainability, and climate change.
- Use the committee as a focal point to share and disseminate information (via committee website, newsletters, Facebook and Twitter).

Joint Simulation Subcommittee (SimSub)

- Continue to strategically develop and strengthen our activities in the simulation modeling and applications area, possibly identify other committee partners
- Continue facilitating development of Transportation System Simulation Manual (TSSM), through proposed TRB Special Task Force on the Development of the TSSM.

- Strategically develop topics and content for Annual Simulation Workshop
- Expand communications vehicles including Newsletter/Annual Report and SimSub website
- Strengthen strategic planning for SimSub by integrating into all sponsoring committees' TSPs

Traffic Flow Characteristics

- Spearhead formation of a joint subcommittee to lead effort in advocating for collection and archiving of observational data in cooperation with other interested committees.
- Expand activities in traffic flow characteristics area, enhance international collaborations and encourage expanded development of high quality data sets that can be used to examine the validity of traffic simulation models, to evaluate congestion remediation actions, safety issues,
- Adopt strong advocacy role for collection and archiving of observational data, using existing and emerging technologies, to support the development and testing of existing and new theories and models that apply to a wide range of traffic phenomena.

Research Problem Statements

- Gain greater traction among committee members and friends in the development and dissemination of research problem statements—annually update and review existing statements (available through website and RNS database)
- Consider developing annual or biannual summary of on-going research efforts in traffic flow theory
- Consider updating Millennium paper on emerging research areas/topics including an assessment of gaps in knowledge and understanding
- Continue to include agenda items at annual and midyear meetings related to development and updating of research problem statements and support Research Problem Statements subcommittee and Committee Research Coordinator.

Communications and Outreach

- Continue to embrace new communications and outreach mechanisms beyond traditional TRB audience through Committee Communications Coordinator and relevant subcommittees
- Continue to use committee website as primary communications venue
- Review past committee sponsored Transportation Research Records and highlight most significant publications since the committee's founding.
- Engage and interact with state DOTs and practitioners for effective dissemination of research advances and state-of-the-art practices.
- Work with ad hoc subcommittee on the website to create a clearinghouse of seminal publications via our website that conveys a sense of the rich history of this field
- Consider expanding clearinghouse into literature review of seminal research
- For expanded inclusiveness continue to grow the webinar series of Annual Meeting papers/presentations after each Annual Meeting
- Develop a 21st century version/venue for the Special Report on Traffic Flow Theory (http://www.tfhrc.gov/its/tft/tft.htm) which has become recognized as an authoritative source of information on traffic flow models worldwide (1964, 1975 and 2002 editions).
- Work with a subcommittee on Teaching Traffic Flow Theory and develop innovative methods of teaching fundamental TFT concepts to students

- Find ways to encourage the mentoring of graduate students and young professionals, particularly to convey the history of traffic flow theory research so that future research can successfully build on the past efforts of the best scholars.

Committee History (CH)

Committee history is included on the website, where performance measures are tracked back to 2002. During the last triennium (2008-2010) the TFTC committee's activities included:

- Committee membership characteristics:
  - Members: 38 (25 regular + 5 international + 4 young + 2 State DOT + 2 emeritus)
    - Geographic: 14 international + 22 U.S.
    - Organizational: 32 university + 1 lab + 2 agency + 1 private
    - Gender/Race: 15 women/minorities (approx.)
  - Number of friends: strong network of friends with 343 (2010), currently 686
- Liaisons with other committees: 6 through SimSub
- Subcommittees and Joint Subcommittees: 10 subcommittees, 1 joint subcommittee,
- Number of papers (see history from 2002) from 2012 → 2014
  - Reviewed: 177→195
  - Presented: 92→107
  - Published: 36→~35
- Number of Annual Meeting events: 1 committee meeting, 1 joint subcommittee meeting, 1 popular Sunday workshop, 5 lectern sessions and 5 poster sessions
- Meeting attendance (2010): 79 Annual Meeting, 65 mid-year meeting, 200+ Sunday Workshop, 61 at SimSub (2011)
- Circulars or other reports published:
  - TR Circular E-C149, 75 Years of the Fundamental Diagram for Traffic Flow Theory: Greenshields Symposium
  - Past traffic flow theory monographs and the millennium paper here.
- Sponsor or co-sponsor specialty conferences, workshops, webinars or other committee activities:
  - Sponsor very popular annual Sunday Workshop on Simulation in partnership with FHWA: 200+ attendees
  - Free Traffic flow webinars (43 since 2010)
  - Midyear meetings: even-numbered years alternate U.S./international; odd numbered years partner with International Symposium on Transportation and Traffic Theory (ISTTT)
- Communications tools used (teleconferences, webinars, listservs, newsletters, etc.)
  - Committee website established 2002: http://tft.ceng.calpoly.edu
  - Free Traffic flow webinars (43 since 2010)
  - Friends listserve: 686 members, self-serve, option to receive in digest format
  - Web-based News Page
  - Google Scholar page listing impact (12,886 citations) of **520** papers contributed to **60** issues of the *Transportation Research Record by the TFTC committee*
  - RSS Feed
  - SimSub Newsletter

    - SimSub website: https://sites.google.com/site/trbcommitteeahb45/Welcome
    - SimSub email list: 120 members
    - Committee Facebook page: 480 “Likes” (followers)
- Research statements developed (RNS, synthesis, NCHRP, etc.) with information on title, date submitted, date last reviewed and link to source:
    - Currently 9 Research Needs Statements
- Previous TSPs (2008 and 2011)