2015 TSM&O Research Themes

AASHTO Subcommittee on TSM&O, Research Working Group ; TRB Regional TSM&O Committee (AHB10); TRB Freeway Operations Committee (AHB20); and the National Operations Center of Excellence (NOCoE)

TSM&O and Decision Support Systems:

Big Data and its implications for analytical tools and systems are significantly influencing and enabling Transportation Systems Management & Operations (TSM&O) within broader corporate and programmatic contexts. Additional technologies and operating strategies (e.g., active traffic management and integrated corridor management) are evolving that require greater awareness of existing and future operating conditions. Transportation agencies are evolving and integrating asset management, operations management, and performance management plans and systems. More holistic technological and institutional models for decision support systems in private industry are being imagined towards transportation agencies – particularly for TSM&O program and service development and management. Concerted research is needed to accelerate the efficient integration of these business management systems within transportation agencies, and to establish next generation technology and business models for TSM&O-oriented decision support systems.

TSM&O for Sustainability & Resilience (Bridging between "Macro & Micro" Operations):

Freight mobility and global economic competitiveness have focused Transportation Systems Management & Operations (TSM&O) on the challenges of metropolitan, intercity, and inter-regional connectivity and reliability. TSM&O is also a vital strategy to address objectives of livability and sustainability within urban spaces and community centers. Enhancing and optimizing national transportation system resilience and advancing sustainability demands a structured recognition of this continuum of operational settings – from the continental scale of global connectivity ("macro-operations") to the neighborhood scale of community connectedness ("micro-operations"). Research is needed to clearly define this scaled context for TSM&O, and to understandably and measurably correlate TSM&O to the national policy priorities of sustainability and resilience. Several emerging research initiatives would complement this opportunity; including those related to smart connected communities, mega-regional transportation operations, TSM&O aspects of logistics management, and others.

Workforce Development for TSM&O:

The increasing demand for TSM&O carries with it an equivalent need for development, maintenance, and expansion of the planning, engineering, operations, and maintenance workforce required to support TSM&O projects and initiatives. Research is needed to address a wide variety of TSM&O workforce development issues such as attracting individuals to careers in TSM&O, retraining existing employees in other disciplines for TSM&O positions, retention of employees, career paths, training, and education.

Vehicle Technology Impacts (including CV/AV) to Fleet Operations and Associated Impacts to TSM&O:

Connected Vehicle and Automated Vehicle technologies have the potential to significantly impact the operation of public and private vehicle fleets such as transit, long and short haul commercial freight, taxis (including new shared mobility services such as Uber), etc. Some auto manufacturers are also beginning to research shared mobility services in the space between taxi's (or single riders) and transit buses (multiple riders). These would be vehicles larger than taxi's but smaller than buses that operate in a real-time demand mode with no specific route. There are also rapidly emerging developments in motive technologies and energy sources for personal vehicles and transit, as well as micro-scale innovations in personal mobility (e.g. electric bicycles) that are likely to dramatically affect the operation and management of the transportation network and associated vehicle and traveler services. Research is needed to determine the impact of these type of connected/automated fleet operations on freeway management systems, arterial management systems, parking management systems, emergency transportation operations, etc.