

AASHTO CTSO – ITS Working Group Meeting

The Next Generation of Traffic Management Systems

What Resources Do Agencies Need & Is There Interest to Collaborate With TRB Technical Committees & Other Groups?

August 27, 2018
Atlanta, Georgia

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Purpose & Desired Outcomes:

Purpose: To discuss the need and AASHTO CTSO ITS Working Group's interest to explore with TRB Technical Committees what research and resources agencies need to plan for and deploy the next generation of traffic management systems (TMSs).

Desired Outcome is to Obtain Feedback on the following:

- What challenges, issues, and methods should agencies consider in planning for and transitioning from legacy TMSs to the next-generation TMSs? (10 Minutes)
- What functions, services, capabilities, and requirements do agencies anticipate needing in their next generation of TMSs? (10 Minutes)
- Is there interest among the CTSO ITS Working Group to collaborate with the TRB Technical Committees on these topics? (5 Minutes)

Why Focus on the Next Generation of Traffic Management Systems?

- Agencies are continuously in a process of monitoring, evaluating, and planning upgrades to and/or replacing their TMSs.
- Advances in technologies (e.g., software, computing, Internet) offer cost-effective options for agencies to consider when they improve or redesign TMSs.
- Changes may be needed to enable TMSs to collect, process, use, and share electronic messages with emerging sources (e.g., mobile devices, connected and automated vehicles).
- New technologies and design changes offer the potential to automate the management (e.g., functions) and operation (e.g., operational strategies, control plans) of TMSs.
- The capabilities, maturity and needs provide the basis for obtaining support to plan for and develop the next generation of TMSs.

Traffic Management Systems – Current State-of-Practice:

- TMSs rely on data from loop detectors & traditional sources (e.g., 911 calls)
- Areas of coverage are limited for a variety of reasons (e.g., cost, telecom capabilities, designs which require sending information back to TMCs)
- Typically reactive operation with limited functions or services automated
- Agencies often procure, manage, and maintain multiple systems (e.g., traffic signals, freeways, HOT lanes) independently and face challenges when making changes (e.g., proprietary software & designs)
- Limited planning or plans developed to support:
 - Expanding coverage or service areas of TMSs
 - Use of different operational strategies and concepts (e.g., automated operation)
 - Upgrades to specific system components (e.g., software platform, computing platform)
 - Systematic upgrades or replacements

Upgrading or Planning for the Next Generation of TMS - What Challenges or Barriers Are Agencies Facing?

- What gaps in practice exist with legacy TMSs?
- What barriers are agencies facing with maintaining or incrementally enhancing TMSs?
- What are agencies using to assess current TMS capabilities and identify needed improvements?

What Should Agencies Consider In Planning for the Next Generation of Traffic Management Systems?

What should agencies consider in preparing for their next generation of TMSs?

- Capabilities, functions or services?
- How agencies may change how they manage and operate traffic?
- How TMSs operate (e.g., automated operation)?
- How TMSs share information and coordinate with other systems or service providers?
- What planning and plans are needed to re-design their TMSs?

Workshop – 2019 TRB Annual Meeting:

Title: “What Do Agencies Need to Assess, Plan, and Develop the Next Generation of TMSs”

1:00-4:00pm, Sunday, Jan. 13, 2019 – Webinar option for remote access

Information: <https://sites.google.com/view/trbfreewayops-ahb20>

Sponsors:

- TRB Freeway Operations Committee
- TRB Regional TSMO Committee
- TRB Artificial Intelligence and Advanced Computing Applications Committee
- TRB Active Traffic Management Joint Subcommittee
- TRB Traffic Signal Systems Committee
- TRB ITS Committee

FHWA Projects – Current or Planned?

- *Decision support subsystems for the next generation of traffic management systems* - outreach material, current practice report, and technical report
- *Framing the Capabilities of the Next Generation of TMSs* - outreach material, white papers & technical reports:
 - Review of current practices
 - Issues to consider in the planning for and transition from legacy TMSs
 - Concept, framework & key principles for the Next Generation of TMSs
 - Options and issues to consider in planning for the Next Generation of TMSs
- *Artificial Intelligence Applications in TMS Operations* - outreach material & review of practice
- *Queue Warnings and Queue Advisories* – electronic message exchanges between CAVs and TMSs (CV Pooled Fund Study)
- *Share and use electronic messages w/ CAVs to improve the use of operational strategies and control plans at and between traffic signals* - ID research needs, priorities and concept of operations (“beyond” MMITSS current capabilities) (CV Pooled Fund Study)

Is the ITS Working Group Interest In Working With TRB Committee's?

- Continue the dialog to identify research and resources needed by agencies planning for and developing of the next generation TMSs?
- Participate in the review of technical resources when they are being developed?
- Support discussion on key topics or issues related to the Next Generation TMSs with the ITS Working Group?
- What research and resources do agencies need?

Resources Currently Available:

■ Resources - FHWA:

- *Integrating Emerging Data Sources into Operational Practice – State-of-Practice Review*
- *Opportunities to Integrate Emerging Data into Traffic Management and TMCs*
- *Capabilities and Limitations of Devices to Collect, Compile, Save, and Share Messages from CAVs & Travelers*
- *Traffic signal management program capability maturity assessment tool - no info system capabilities or planning*
- Adaptive signal control technology - system engineering documents & outreach material
- Active transportation and demand management resources

■ Traffic Management Center Pooled Fund Study Resources:

- Considerations of Current and Emerging TMC data
- Developing and Using Concept of Operations in TMSs
- Regional, Statewide, and Multi-State TMC Concept of Operations and Requirements
- TMS for Performance and Mobility Measures Guidebook
- Guidelines for Virtual Transportation Management Center Development
- Connected Vehicle Impacts on ITS Functions
- Impacts of Technology Advancements on TMC Operations

■ Research Needs:

- TRB Research Circular #218: Advancing Freeway Operations Through Strategic Research
- Chapter on research needs for TMSs
- List of proposed research proposals – AASHTO CTSO Working Group

■ Technical Assistance: NOCOE web site <https://transportationops.org>



Thank you for your participation & feedback!

If you have any additional feedback, please email:

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