

TRANSPORTATION SYSTEM SIMULATION MANUAL (TSSM) DEVELOPMENT UPDATE

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George List, NC State

David Hale, Leidos

Brandon Nevers, Rick Dowling, Kittelson

Rob Bertini, USF

Presentation Overview

- Target audience
 - SimSub's parent committees
 - FHWA reports to other committees at TRB
- Brief history of the TSSM
- Evolution of SimSub and Task Force
- Current state of the TSSM
 - Volumes I, II, III, IV
- Research needs statements
- Ownership and maintenance
 - Publishing challenges

Brief History

- 1963:** TRB Committee on Traffic Flow Theory and Characteristics
- 1964:** HRB Special Report 79 Introduction to Traffic Flow Theory
- 1975:** TRB Special Report 165 Traffic Flow Theory: A Monograph
- 2001:** Traffic Flow Theory Monograph
- 2005:** Joint Simulation Subcommittee (SimSub) Established
- 2008:** Woods Hole - Greenshields Symposium
- 2012:** Fort Lauderdale – Joint Summer Meeting with HCQS Committee
- 2014:** Original TSSM Development Contract (KAI Lead)
- 2015:** TRB System Simulation Task Force Established
- 2016:** Current TSSM Development Contract (Leidos Lead)
- 2018:** Task Force not renewed
- 2019:** TSSM draft conveyed to SimSub

TSSM



“Creative Differences”

DOTs, Pooled Fund Study

- Software-specific guidance
- Step-by-step instructions
- Example problems
- Case studies
- Practicality

FHWA, Academia

- Software-agnostic guidance
- Understanding of principles
- Algorithm development
- Advance the practice
- Future-oriented

“Committees owning the manual should have a mix of backgrounds, because the DOTs need to provide funding. Researchers need to sell them on the importance of various research topics.”



Evolution of SimSub and Task Force

- Simulation Task Force
 - Created in 2015
 - Not renewed – thanks for your service
 - Certificates for all members
- SimSub will manage TSSM
 - New membership structure, appointment letters
 - New website developed by Taylor Li
 - Linkage to TSSM website
 - Responsibility for further TSSM development and maintenance
 - May create a research subcommittee to develop research needs statements



TSSM from the Current Project

- Complete First Draft
 - Volume I: Basic Simulation Concepts
 - Volume II: Model Development and Application
 - Volume III: Case Studies
- Additional Items from the Current Project
 - Research needs statements (RNS)
 - State-of-the-practice report
 - Stakeholder register

TSSM Structure

- Ch. 1: What is Simulation
- Ch. 2: Simulation Options
- Ch. 3: Principal Ideas
- Ch. 4: Use Issues
- **Ch. 5: Defining the Problem**
- **Ch. 6: Data**
- **Ch. 7: Creating the Network**
- **Ch. 8: VC&V**
- **Ch. 9: Output Analysis**
- Ch. 10: Post-Project Validation

“Critical Needs”

Vol. I

Vol. II

TSSM Structure (continued)

- Ch. 11: Overview of the Volume
- Ch. 12: Freeway System Models
- Ch. 13: Arterial System Models
- Ch. 14: Freeway/Arterial Systems



Vol. III

Research Needs Statements (RNS)

- Simulating Work Zones
 - Research best practices, develop tools to simulate WZ dynamics
- Data Fusion and Assembly for Simulation Models
 - Research best practices, develop guide for data-driven simulation
- Simulating Mixed Traffic Flows
 - Trucks and autos, CAVs and non-CAVs
- Multi-Tool Analyses
 - Combinations of various types of software
 - Based on agency practice
 - Examples: parallel macro-, meso-, micro; embedded micro
- Simulation Models in Agency Decision-Making
 - How agencies use simulation in decision making

Ownership and Maintenance

- TRB publications are in flux
 - Publishing now managed by Sage
 - How to deal with the HCM, etc. in flux
 - TSSM is further back in the queue
- Suggestions for managing the TSSM
 - TRB SimSub: suggested, good for research, publishing obstacles
 - ITE SimCap: a possibility, but less academic involvement, good for advertising, research obstacles
 - AASHTO: does not seem best match; not safety or investment)
 - There may be other options

Questions and Answers

Thank You