Annual Report 2014

TRANSPORTATION RESEARCH BOARD
JOINT TRAFFIC SIMULATION
SUBCOMMITTEE

AHB45 (1)

SimSub

Chairman's Message

SimSub Chair
Dr. George List
NC State University

It is always a pleasure to introduce you to this SimSub annual report. It is being sent to you contemporaneous with the 2015 Annual TRB Meeting. As you can see, SimSub continues to be very active. More than 150 people attended last year's Traffic Simulation Workshop. This year we have an impressive set of speakers focused on recent advances in traffic simulation, especially for urban highway networks. The main emphasis will be on agent-based simulation models, but other paradigms will be included. The intent is to make researchers and practitioners aware of the capabilities of such models, and the prospects for future development of these tools. Perhaps the biggest news is the effort underway, sponsored by FHWA, to create initial materials for a Transportation System Simulation Manual (TSSM). The intent is to have it managed by TRB akin to the HCM, the HSM, and similar documents. As you may remember, this is an outgrowth of discussions in the summer of 2010 when TFT held its mid-year meeting jointly with the HCQS Committee. It was determined there was a need to bring a more focused attention to the topic of transportation simulation. As we know, demand for the development and application of simulation tools continues to rise; as agencies strive to identify feasible improvements in increasingly constrained, congested, and multi-modal environments. Moreover advances in computing power, and new data sources facilitating proper and efficient application of simulation models, has increased the potential to build and run simulation networks "faster and cheaper". The development of this TSSM as an authoritative and centralized resource will serve as a major advancement of the efficacy of simulation modeling in practice; much as did the Highway Capacity Manual, Roundabout Guide, and Highway Safety Manual in their respective fields. The TSSM is expected to be more than just a manual and set of guidelines. It can embody agreed-upon practices from experts all across the country in all facets of the profession including academia, agency departments of transportation, consultants, software developers/vendors, and other stakeholders. It can become a unifying product for professional organizations and committees (akin to the Highway Capacity and Quality of Service Committee) and can serve as a springboard for future research. It can also become the go-to resource for education and training, and the first product that any aspiring simulation modeler is exposed to. FHWA has taken these ideas to heart and engaged a research team to provide an outline for the manual and draft material for one chapter. The anticipation is that funding organizations like NCHRP will provide additional support so a first draft of the manual can be produced. TRB is considering formation of a task force to spearhead this effort and bring the TSSM to fruition. During our meeting Monday evening we will hear reports from our sponsoring committees, task group leaders, FHWA, and representatives from a few related projects; but we will also devote substantial time to discussion of the TSSM, and the direction in which that effort should be aimed in the future. The TSSM development team needs your inputs, your thoughts. As always, we need to thank David Hale for his efforts as the new newsletter editor. He works diligently and tirelessly to assemble this document for our benefit. In closing, we look forward to your continuing involvement and support; and to seeing you at the annual meeting this month (at our new venue!).

SimSub Web Site
Alex Stevanovic, Webmaster **http://sites.google.com/site/trbcommitteeahb45**

2015 Upcoming Events

2015 Road Safety & Simulation International Conference

http://stc.utk.edu/STCevents/rss2015/index.html

October 6-8, 2015, Orlando, Florida, USA

Co-hosted by University of Central Florida & The University of Tennessee

The University of Central Florida (UCF) and the University of Tennessee, Knoxville (UTK) are pleased to host the 2015 Road Safety & Simulation International Conference.

The RSS series showcases advancements in traffic simulation and driving simulator technologies, introducing new initiatives and concepts that have emerged since the first RSS conference in Rome, Italy in 2007. Under the auspices of the Southeastern Transportation Center, three world-class research centers will support the conference: Center for Advanced Transportation Systems Simulation, and the Institute for Simulation and Training at UCF; and UTK's Center for Transportation Research. These centers conduct sponsored research in driving simulators, traffic simulation, traffic safety, commercial vehicle operations, Intelligent Transportation Systems deployment, and congestion pricing; human factors; and comprehensive transportation safety, including surface modes, rail, and bicycle and pedestrian issues.

The STC is administered through the Center for Transportation Research, part of the College of Engineering at The University of Tennessee.

Deadlines

- Abstracts due: **October 24, 2014**
- Notification of abstract acceptance or rejection: **January 16, 2015**
- Full papers due (for accepted abstracts): **April 17, 2015**
- Full paper notification of acceptance or rejection: **July 31, 2015**
- Confirmation from authors to present: **August 28, 2015**
- Conference: **October 6 - 8, 2015**

Sponsorship

RSS 2015 will soon offer companies the opportunity to gain visibility and showcase their products and services during the conference

Southeastern Transportation Center
309 Conference Center Building
Knoxville, Tennessee 37996-4133

865.974.5255

Media contact: Lissa Gay

lissa@utk.edu | 865.974.8760

2015 Upcoming Events

Announcement of Summer School in "Advanced Traffic Simulation"

A focused and intensive three day Summer School on Advanced Traffic Simulation will be hosted in the University of Cyprus in ***June 10-12, 2015*** , building on the COST Action TU0903 – MULTITUDE (Methods and tools for supporting the Use, caLibration and validaTIon of Traffic simUlation moDEls - www.multitude-project.eu). The selected and invited lecturers are some of the most experienced academics and researchers in the field across Europe (alphabetically, Constantinos Antoniou-NTUA, Mark Brackstone-TSS, Biagio Ciuffo-EC-JRC, Loukas Dimitriou-UCY, Nikolas Geroliminis-EPFL, Serge Hoogendoorn-TU Delft, Vincenzo Punzo-UniNA). The Summer School is balanced between theoretical coverage and training on advanced traffic simulation methods and models, their systematic calibration and validation, the reliability of predictions made by traffic simulation models, and tools and frameworks for the management of realistic systems. Several case studies will be presented and a team-based, hands-on, practicum will guide attendants through the application of the whole process of uncertainty management in traffic simulation.

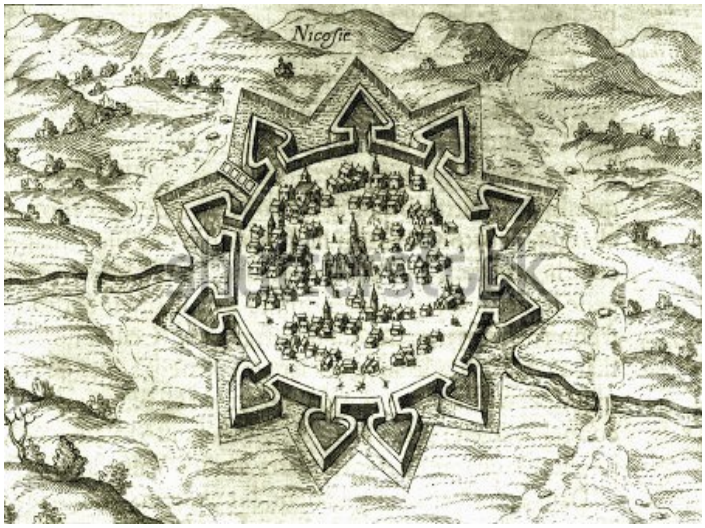
The school is targeted at graduate students, engineers, researchers, consultants and government employees who wish to improve their understanding and skills in applying traffic simulation to real-world scenarios. The school will follow a 2-day advanced training program on AIMSUN, offered by TSS.

University of Cyprus

Info and Deadlines
Maximum number of participants: 40
Registration opens: January 30, 2015
Registration deadline: April 15, 2015
Acceptance confirmation: April 25, 2015
Registration fee: 50 Euros (includes coffee-breaks, lunches and a social dinner)

Applications and more information soon at:
www.multitude-project.eu

For information contact:
lucdimit@ucy.ac.cy
antoniou@central.ntua.gr



2015 Upcoming Events

ANT-2015 - Modeling and Simulation in Transportation Sciences

The 6th International Conference on Ambient Systems, Networks and Technologies (ANT-2015)

Track on Modeling and Simulation in Transportation Science

http://cs-conferences.acadlau.ca/ant-15/

London, UK (2-5 June 2015)

ANT-2015 is a leading international conference for researchers and industry practitioners to share their new ideas, original research results and practical development experiences from all Ambient Systems, Networks and Technologies related areas.

ANT-2015 will be held in conjunction with the International Conference on Sustainable Energy Information Technology [SEIT]).

ANT 2015 will be held in London, UK (2-5 June 2015).

Transportation Research Institute
(IMOB)
Hasselt University
Wetenschapspark 5 bus 6
B-3590 Diepenbeek, Belgium

2015 Upcoming Events

SCOPE

*The goal of the **ANT-2015** conference is to provide an international forum for scientists, engineers, and managers in academia, industry, and government to address recent research results and to present and dis- cuss their ideas, theories, technologies, systems, tools, applications, work in progress and experiences on all theoretical and practical issues arising in the ambient systems paradigm, infrastructures, models, and technologies that have significant contributions to the advancement of ambient systems theory, practices and their applications.*

At ANT-2015, there is a dedicated track on Modeling and Simulation in Transportation Sciences (MSTS) organized *by the Transportation Research Institute (IMOB), Hasselt University, Belgium. The aim of this track is to bring together communities interested in the computation, knowledge discovery and technology policy aspects of transportation systems. Researchers in the domains of transportation sciences and engineering, computer science, urban and regional planning, civil engineering, geography, geo-informatics and related disciplines can submit papers for presentation and for publication in the conference proceedings.*
Check-out the website for a detailed overview of the topics of interest!

SUBMISSION AND PROCEEDINGS

All ANT-2015 accepted papers will be printed in the conference proceedings published by Elsevier Science in the open-access Procedia Computer Science.

The submitted paper must be formatted according to the guidelines of Procedia Computer Science, MS Word Template, Latex, Elsevier.

Submitted technical papers must be no longer than 8 pages for full papers and 5 pages for short papers including all figures, tables and references.

Authors are requested to submit their papers electronically using the online conference management system in PDF format before the deadline (see Important Dates). The submission processes will be managed by easy-chair.org.

All accepted papers will be scheduled for oral presentations and will be included in the conference proceedings published by Elsevier Science in the open-access Procedia Computer Science series on-line. At least one author of each accepted paper is required to register and attend the conference to present the work.

IMPORTANT DATES

Submission date: 10 January, 2015.
Notification of acceptance: 1 March, 2015.
Camera-ready date: 1 April, 2015.
Conference: 2-5 June, 2015.

REGISTRATION

Please visit: *http://cs-conferences.acadiau.ca/ant-15/#registration* for more information.

VENUE, ACCOMMODATION & VISA REQUIREMENTS

Please visit: *http://cs-conferences.acadiau.ca/ant-15/#conferenceVenue* for more information.

PROGRAM VICE-CHAIRS

Prof. dr. Davy Janssens | IMOB - UHasselt | Belgium | *davy.janssens@uhasselt.be*

You may also visit our website (*http://cs-conferences.acadiau.ca/ant-15/*) for more details.

2015 Upcoming Events

The 6th International Conference on Ambient Systems, Networks and Technologies (ANT-2015)

The 4th International Workshop on Agent-based Mobility, Traffic and Transportation Models, Methodologies and Applications (ABMTRANS'15)

http://www.uhasselt.be/UH/datasim/ABMTRANS.html

In conjunction with ANT-2015 conference | London, UK (2-5 June 2015)

ABMTRANS 2015 provides an International forum on the latest technologies and research in the field of traffic and transportation modeling using an agent-based approach.

ABMTRANS 2015 will be held in London, UK (2-5 June 2015) in conjunction with The 6th International Conference on Ambient Systems, Networks and Technologies (ANT-2015).

Transportation Research Institute (IMOB)
Hasselt University
Wetenschapspark 5 bus 6
B-3590 Diepenbeek, Belgium

SCOPE

This workshop provides a multidisciplinary collaborative forum for researchers and practitioners to submit papers presenting new research results and novel ideas related to the theory or the practice of agent-based traffic and transportation modeling.

This workshop also invites researchers to submit their work focusing on the data mining, management and configuration for agent-based traffic and transportation modeling.

Check-out the website for a detailed overview of the topics of interest!

SUBMISSION AND PROCEEDINGS

All papers accepted for workshops will be included in the ANT-2015 proceedings, which will be published by Elsevier.

The authors must follow Elsevier guidelines as given in ANT-2015 website (*http://cs-conferences.acadiau.ca/ant-15/*).

The submission processes will be managed by easychair.org.

The selective outstanding papers presented at the workshops, after further revision, will be considered for publication in journals special issues.

All workshops accepted papers will be printed in the conference proceedings published by Elsevier Science in the open-access Procedia Computer Science series (on-line).

The selective outstanding papers presented at the workshops, after further revision, will be considered for publication in journals special issues at ANT'15.

IMPORTANT DATES

Submission deadline: 15 January, 2015
Notification of acceptance: 10 March, 2015
Camera-ready deadline: 1 April, 2015
Workshop: 2 - 5 June, 2015

REGISTRATION

Please visit: *http://cs-conferences.acadiau.ca/ant-15/#registration* for more information.

VENUE, ACCOMMODATION & VISA REQUIREMENTS

Please visit: *http://cs-conferences.acadiau.ca/ant-15/#conferenceVenue* for more information.

WORKSHOP ORGANIZERS

dr. Ansar-Ul-Haque Yasar
Transportation Research Institute (IMOB) | Hasselt University (Belgium)
ansar.yasar@uhasselt.be

ir. Luk Knapen
Transportation Research Institute (IMOB) | Hasselt University (Belgium)
luk.knapen@uhasselt.be

If you have any further questions please contact one of the workshop organizers.

2014 Simulation Events

First International Workshop on Information Fusion for Smart Mobility Solutions (IFSMS14)

http://www.multiagent.fr/Conferences:IFSMS14

22-25 September, 2014, Halifax, Nova Scotia, Canada

Description

The 1st International Workshop on Information Fusion for Smart Mobility Solutions (IFSMS'14) provides an international forum on the latest technologies and research in the field of smart mobility solutions. We are living in a world where cars will soon all be very well-equipped with sensors such as GPS sensors, laser radars, infrared parking sensors, rear dead angle cameras, etc. Besides that, the infrastructure itself is likely to soon exploit technologies currently widely used, like smartphones, navigators and digital radio broadcast. Finally, there have been huge advances on traffic simulation, optimization, intensive computational techniques, distributed computing, data networks, wireless connectivity, and many others. If we combine all of this, there is the richest variety ever of information sources available for smart mobility solutions. The technology is out there, and now it is needed to take firm steps towards wisely combining the sources of information into smar t applications that make roads safer and ensure a smooth mobility of individuals.

IFSMS 2014 will be held in Halifax, Nova Scotia, Canada (22-25 September 2014) in conjunction with the 5th International Conference on Emerging Ubiquitous Systems and Pervasive Networks (EUSPN-2014).

Scope

The aim of the proposed workshop is to enhance profitable discussions on what techniques, software, methodologies, transportation and traffic models, and in general, data fusion techniques are being explored for its use for traffic simulation and mobility management and other intelligent transportation system applications for smart mobility.

Topics of interest include (but are not limited to):

- Agent-based modeling and simulation
- Data fusion and Smart Transportation
- Social and emergent behavior in MAS-T (multi-agent systems applied to traffic and transport)
- Implementation Issues such as Algorithmic Issues, Real-World Computational Demands, Real-Time Constraints in the context of Fusion systems for Transportation Infrastructures
- Environmental Aware Smart Data Fusion applications
- Advanced Architectures for Traffic Simulation using Data Mining as Real-World input
- Calibration and validation of agent-based models for traffic and transportation
- Role of multi-agent methodologies for complex systems
- Multi-modal routing of agents in a dynamic traffic environment

Important Dates

- Submission deadline: April 30, 2014
- Notification: June 24, 2014
- Final date for camera-ready copy: July 17, 2014
- Workshop: September 22-25, 2014

2014 Simulation Events

August 21, 2014

Turner-Fairbank Highway
Research Center,
McLean, VA

U.S. Department of Transportation
Federal Highway Administration

EXPLORATORY ADVANCED RESEARCH

Office of Safety Research and Development

FHWA AGENT-BASED MODELING AND SIMULATION FOR TRANSPORTATION: A LOOK AT 5 YEARS OF RESEARCH AND DISCUSSION OF THE FUTURE

Presentation 1:

Final Study Briefing for 'VASTO-Evolutionary Agent System for Transportation Outlook'

This presentation covers the key research accomplishments of the VASTO project, including (1) agent-based modeling and simulation (ABMS) and dilemma zone methodology, (2) ABMS and active travel and demand management, (3) visualization, and (4) system integration. The first part of this presentation will discuss the experimental design for driver behavior data collection using FHWA's Highway Driving Simulator; development process for the dilemma zone scenario; and a dilemma zone model, where drivers' decisions are represented by extended Belief-Desire-Intention (BDI) framework. Then, the presentation will discuss ABMS applications for behavior analysis. Third, the presentation will demonstrate visualization methods to gain better understanding of route choices by comparing the differences between vehicle trajectory data recorded before and after certain events. Finally, the presentation will discuss the VASTO system integration.

Presenters:

Dr. Yi-Chang Chiu, University of Arizona
Dr. Young-Jun Son, University of Arizona
Dr. Jyh-Ming Lien, George Mason University
Mr. Sojung Kim, University of Arizona
Mr. Ye Tian, University of Arizona
Ms. Mary Anne B. Jeffers, Leidos
Mr. Jason Williams, AAI Corporation

Presentation 2:

Modeling Driving Behavior with Intelligent Agents: Driver Behavior in Traffic and Beyond

This presentation describes a novel methodology to combine safety and operational modeling aspects of driver behavior, using intelligent agents. Naturalistic driving data was used to train Neuro-fuzzy reinforcement learning agents to clone the behavior of selected drivers during normal and safety-critical events. The developed agents were implemented in VISSIM. Extended efforts based on this work are briefly described as well.

Presenter:

Dr. Montasir Abbas, Virginia Tech

Presentation 3:

Agent-Based Approach for Integrated Driver and Traveler Behavior Modeling

This project develops a flexible agent-based behavior modeling framework with a strong theoretical foundation, practical micro-level behavior modeling methods, and an implementation platform for real-world applications to transportation systems planning and operations. This presentation will cover (1) Methods for modeling multidimensional agent-based travel decision-making processes at the microscopic individual level, and methods for aggregating micro-level behavioral rules and interactions into system-level statistics for analysis and applications; (2) Development of a novel dynamic behavioral user equilibrium (BUE) approach for behaviorally-realistic agent-based transportation systems models that promise fast run time and quick convergence in large-scale integrated models; and (3) Demonstration of the proposed agent-based tools in a series of real-world applications in the areas of transportation planning and traffic operations, such as pricing, integrated corridor management, and reliability improvement.

Presenters:

Dr. Lei Zhang, University of Maryland

Mr. Subrat Mahapatra, Maryland State Highway Administration

Presentation 4:

Modeling the Impact of ITS Components in Regional Transportation Simulations

Over the past 3 years, TRACC developed POLARIS as an efficient agent-based open source modeling platform for transportation systems simulations. The platform is extensible, and provides for feedback and flexible agents that can instantly react to network changes and information provided by ITS components. Current efforts include calibration of POLARIS on the Chicago Metropolitan Area network, interactive communication with running simulations through a visualization interface, and the development of a browser-based visualization platform called MetraView that can perform complex dynamic visualizations at local execution speed through a web service.

Presenter:

Dr. Hubert Ley, Argonne National Laboratory

Break

Group Discussion: Where do we go from here?

A discussion on: the future of ABMS research, how to incorporate ABMS into transportation research, and how the FHWA can pass the torch for others to continue research

2014 Simulation Events

U.S. Department of Transportation
Federal Highway Administration

EXPLORATORY ADVANCED RESEARCH

Office of Safety Research and Development

FHWA AGENT-BASED MODELING AND SIMULATION FOR TRANSPORTATION: A LOOK AT 5 YEARS OF RESEARCH AND DISCUSSION OF THE FUTURE

David Yang
Federal Highway Administration

2014 Simulation Events

Yi-Chang Chiu (University of Arizona)
Mary Anne Jeffers (Leidos)

Jyh-Ming Lien (George Mason University)
Jason Williams (AAI Corporation)

2014 Simulation Events

Montasir Abbas (Virginia Tech University)
Lei Zhang (University of Maryland)

Subrat Mahapatra (Maryland State Highway Admin.)
Hubert Ley (Argonne National Laboratory)

2014 Simulation Events

ITE Annual Meeting in Seattle
http://www.ite.org/annualmeeting
August 10-13, 2014, Seattle, WA

This year's annual ITE meeting contained sessions and workshops related to traffic simulation. On August 11th, speakers offered simulations of various intersection designs. On August 12th, speakers compared tools for simulation, optimization, and capacity analysis. Also on the 12th, the national ITE SimCap user group discussed hot topics for 90 minutes.

Mainstreaming Alternative Intersections
Washington State Convention & Trade Center - Room 607

Sponsored by: *Transportation Safety Council*

Attendees will learn about the efforts to mainstream a handful of alternative intersections in the United States, specifically, the Diverging Diamond Interchange, U-Turn-based Designs and the Displaced Left Turn.

Moderator: Peter U. Eun, Transportation Safety Engineer, USDOT -FHWA, Olympia, WA, USA

Speakers:
Every Day Counts for Safety – Advancing Key Innovative Intersection Treatments
Gilbert Chlewicki, Director, Advanced Transportation Solutions, Silver Spring, MD, USA

Evaluation of Diverging Diamond Interchanges in the U.S.
Wei Zhang, Highway Research Engineer, USDOT-FHWA, McLean, VA, USA

Introduction of the Triangabout: A New Alternative Intersection Design
Andrew P. Nichols, Associate Professor, Marshall University, Huntington, WV, USA

2014 Simulation Events

ITE Annual Meeting in Seattle
http://www.ite.org/annualmeeting
August 10-13, 2014, Seattle, WA

Traffic Analysis Software Program Studies & Comparisons-Sharing Analysis, Expertise, Knowledge & Results
Washington State Convention & Trade Center - Room 607

Sponsored by: *Traffic Engineering Council - Sim-Cap*

Attendees will get a better understanding of the multitude of traffic analysis and signal optimization tools that are on the market and how the results from each software examined compared with one another.

Moderator: Christa A. Greene, Senior Traffic Engineer, Stantec Consulting, Raleigh, NC, USA

Speakers:

An Agency's Perspective of Traffic Analysis Tools
James H. Dunlop, Congestion Management Engineer, North Carolina DOT, Garner, NC, USA

Evaluation of Various Simulation Models
Kellie L. Reep, Transportation Engineer, Stantec Consulting, Raleigh, NC, USA

Seattle
ite 2014 ANNUAL MEETING & EXHIBIT
WASHINGTON STATE CONVENTION & TRADE CENTER
AUGUST 10–13, 2014

Traffic Model Comparison Research
Andrea R. Bill, Traffic Safety Program Manager, University of Wisconsin-Madison, Madison, WI, USA

Methods of Signal Optimization – A National Perspective
John A. Albeck, President, Albeck and Associates Inc., Omaha, NE, USA

2014 Simulation Events

Traffic Flow Theory and Characteristics Committee (AHB45)
2014 Summer Meeting - August 11-13, 2014 - Portland, OR

Celebrating 50 Years of Traffic Flow Theory

Call For Papers
We are pleased to announce a call for papers for the Transportation Research Board (TRB) Committee on Traffic Flow Theory and Characteristics Symposium Celebrating 50 Years of Traffic Flow Theory and Midyear Meeting to be held in Portland, Oregon, USA, August 11-13, 2014. Selected top papers will have the opportunity to be considered for publication in special issues of two top transportation academic journals, and all presented papers will be published in a special issue of the *Transportation Research Circular* series.

Background: The predecessor committee focusing on traffic flow theory was organized 50 years ago, and this is an appropriate time to recognize the past accomplishments in the field, reflect on the present state of our research community and identify key future directions. Papers on all topics in the traffic flow theory and characteristics domains are welcome. This symposium builds on past successful symposia beginning with the *Greenshields Symposium* in Woods Hole, MA in 2008, the *Does Traffic Data Support Traffic Models Symposium* in Annecy, France in 2010 and the *Symposium on Advancements in Traffic Flow Theory and Highway Capacity and Quality of Service* in Fort Lauderdale, FL in 2012.

Important Dates:

March 1, 2014 Extended Abstracts Due
April 15, 2014 Authors Notified of Paper Decisions
July 25, 2014 Papers Due for Conference Proceedings

Instructions: For full consideration, download an extended abstract template, and submit a 4-page (maximum) abstract by March 1, 2014. Selected authors of the top papers will be asked to submit full papers by July 25, 2014 for further consideration for special issues by two top transportation academic journals. All accepted authors are asked to submit final papers by July 25, 2014 for inclusion in symposium proceedings and *TR Circular*.

For More Information: For additional information please contact the Symposium Chair, Prof. Robert Bertini (bertini@pdx.edu, 503-725-4249) at Portland State University.

2014 Simulation Events

Modeling and Simulation of Transportation Networks

July 28 - August 1, 2014

http://web.mit.edu/professional/short-programs/courses/simulation_transportation.html

Introduction

Modeling and simulation methods are essential elements in the design and operation of transportation systems. Congestion problems in cities worldwide have prompted at all levels of government and industry, a proliferation of interest in Intelligent Transportation Systems (ITS) that include advanced supply and demand management techniques. Such techniques include real-time traffic control measures and real-time traveler information and guidance systems whose purpose is to assist travelers in making departure time, mode, and route choice decisions. Transportation researchers have developed models and simulators for use in the planning, design, and operations of such systems. This course draws heavily on the results of recent research and is sponsored by the Intelligent Transportation Systems Laboratory of the Massachusetts Institute of Technology. The course studies theories and applications of transportation network demand and supply models and simulation techniques. It provides an in-depth study of the world's most sophisticated traffic simulation models, demand modeling methods, and related analytical techniques, including discrete choice models, and their application to travel choices and driving behavior; origin-destination estimation; prediction of traffic congestion; traffic flow models and simulation methods (microscopic, mesoscopic, and macroscopic); and alternative dynamic traffic assignment methods.

Learning Objectives

1. Understand transportation network demand and supply models.
2. Distinguish among alternative approaches to dynamic traffic assignment and traffic simulation.
3. Assess the advantages and disadvantages of alternative network modeling and simulation methods.

Program Outline

Traffic Performance
Modeling & Simulation Approaches, Macroscopic Traffic Models & Intro to Traffic Simulation, Microscopic/Mesoscopic Traffic Simulation, Static/Dynamic Network Supply Models

Demand and User Behavior
Overview of Discrete Choice Analysis, Route & Time-of-Travel Choice, Activity-Based Models, Integrated Land Use & Transportation Models

Traffic Assignment
Framework for Demand/Supply Interactions, Equilibrium & Day-to-Day Dynamics, Testing Optimization Algorithms, Pricing & Travel Time Reliability

Public Transportation Models
Framework & Low Frequency Services, High Frequency Services

Freight Models
Economic Activity Models, Logistics Choices

Real-Time Systems
Evaluation of Traffic Predictions

Calibration and Validation
Estimation of Origin to Destination Flows from Counts, Estimation of Behavioral Models & Simultaneous Calibration

Lecturers

Professor Moshe Ben-Akiva, Director of the MIT ITS Laboratory, is the Lecturer-in-Charge. Guest lecturers may include: Ennio Cascetta (University of Naples/Ministry of Transport - Regione Campania, Italy), Pierluigi Coppola (University of Rome), Haris Koutsopoulos (KTH Royal Institute of Technology), Hani Mahmassani (Northwestern University), and/or Maya Abou-Zeid (American University of Beirut)

DATA SIM Summer School (14-17 July 2014)

www.datasim-fp7.eu

DATA SIM Summer School 2014

The **Transportation Research Institute (IMOB)** of Hasselt University organizes the first DATA SIM Summer School on 'Mobility modeling and big data sources'. This Summer School will take place at **Hasselt University, Campus Diepenbeek** (Agoralaan Building D, 3590 Diepenbeek, Belgium) from **Monday July 14th to Thursday July 17th.**

Topics

This Summer School will feature a series of lecturers by renowned researchers in the following topics:

	**Mobility modeling: basic principles and tools.** 1. Behavior modeling, activity based models (activity selection, planning, daily schedule generation) 2. Multi-modal trips 3. Modeling cooperation, cooperative scheduling (e.g. carpooling) 4. Ontologies 5. Traffic and transportation related models, travel demand prediction models 6. Simulations in practice: what conclusions can be drawn?
	**Special focus: Agent based modeling and simulation for mobility, travel behavior, mobility market, electro-mobility (including smart grid, etc.).** 1. Delimiting the domain of applicability: where can agent based modeling be useful? 2. Models for cooperation, mutual influence, negotiation 3. Computability issues, scalability 4. Ontologies 5. How to interpret results? What can be expected?
	**Big data as source for modeling.** 1. Big data repositories 2. Annotation, semantic enrichment of big data 3. Data mining and process mining to extract information from big data 4. Crowd sourcing and publicly available data: pitfalls and challenges **5.** Using data from different sources: how to align?

2014 Simulation Events

	**Integrating big data and modeling.** 1. Using big data to feed models or to validate model execution results 2. How to integrate semantically poor big data with small sets of semantically rich data as input for microsimulation or agent based modeling
	**Applications** 1. Electric vehicles (including smart grid concepts) 2. Carpooling (cooperation on trip traveling) 3. Multi-modality and car-sharing (cooperation on resource usage) 4. Markets based on big data related to traffic • Business models for EV, multi-modal trips, car-sharing, carpooling • Online support systems (ride sharing advisors) • Traffic load prediction systems 5. Effect of EV characteristics (range anxiety, charging time, limited range) on household travel behavior
	**Research topics in transportation behavior, traffic safety and logistics.**

Target audience

The Summer School is suited for senior-researchers, early-stage researchers, practitioners and (PhD) students from the domain of transportation sciences, data mining, agent/activity based modeling and related topics.

Participants will have the opportunity to get feedback on their work during the graduate symposium sessions. Participants are strongly encouraged to present their work and to submit a 1 page (A4) abstract describing the main research objectives and methods used not later than 2014-jun-15.

Participation Certificates

Participation Certificates will be issued to all participants of the Summer School.

Contact

For more information please contact Luk Knapen (luk.knapen@uhasselt.be) for questions about the program, Edith Donders (edith.donders@uhasselt.be) for questions about registration and accommodation or consult the DATASIM Summer School web pages (http://www.uhasselt.be/UH/datasim/Summer-School-2014/About-Summer-School-2014.html).

2014 Simulation Events

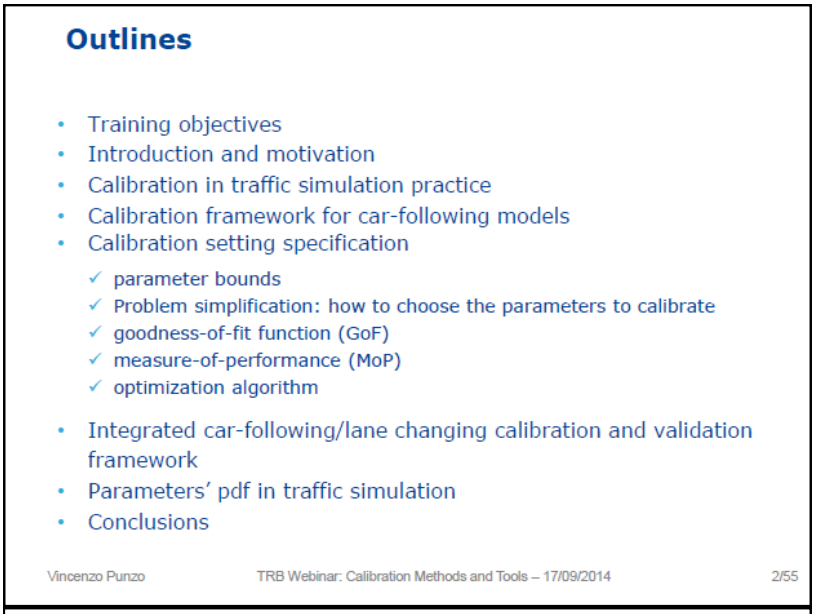
TRB Webinar: Calibration Methods and Tools

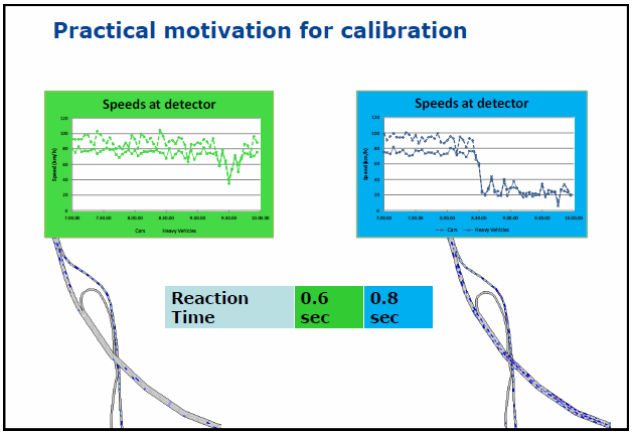
http://www.trb.org/main/blurbs/170986.aspx

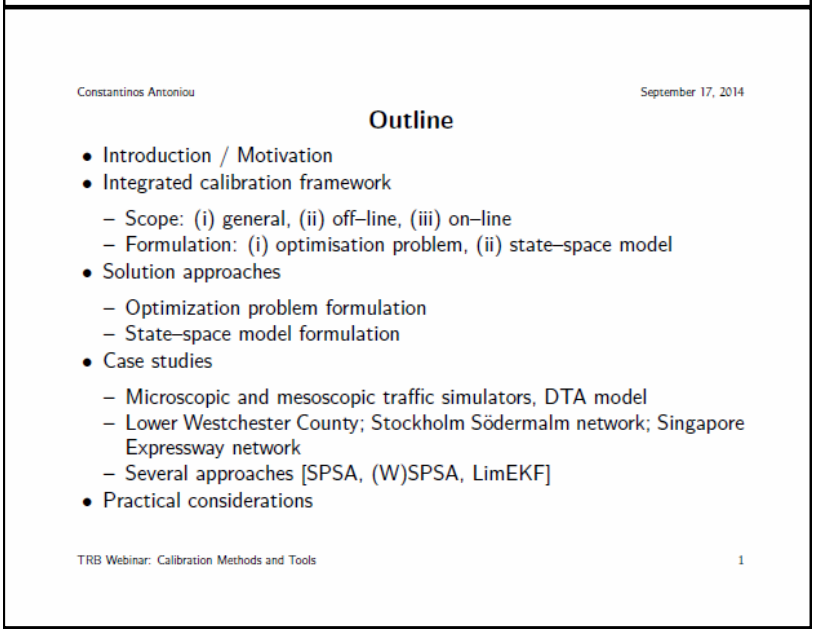
TRB will conduct a webinar on September 17, 2014, from 12:00pm to 1:30pm ET that will explore recent advancements in software-assisted calibration and sensitivity analysis. Webinar presenters will discuss the basics of calibrating microscopic behavioral sub-models in traffic simulation models when using disaggregate data, as well as present the basics of calibrating demand and supply aspects of traffic simulation models, including basic methodological elements, algorithms and tools, and case study results.

Webinar Presenters
• Vincenzo Punzo, University of Naples Federico II, Italy
• Constantinos Antoniou, National Technical University of Athens, Greece

Moderated by: George List, North Carolina State University







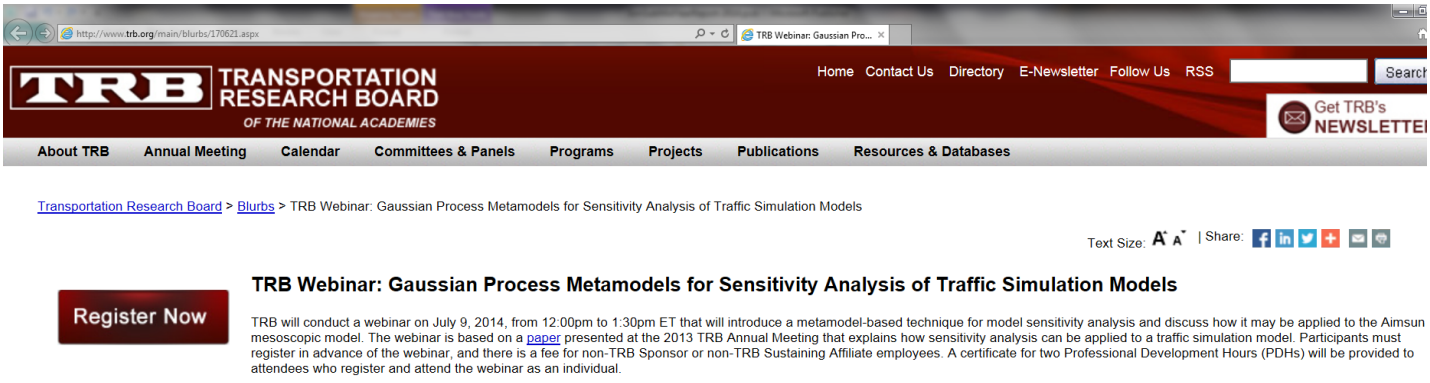
2014 Simulation Events

TRB Webinar: Gaussian Process Metamodels for Sensitivity Analysis of Traffic Simulation Models

http://www.trb.org/main/blurbs/170621.aspx

Learning Objective

At the end of this webinar, participants will be able to summarize advanced methods for the analysis of traffic simulation models.



TRB will conduct a webinar on July 9, 2014, from 12:00pm to 1:30pm ET that will introduce a metamodel-based technique for model sensitivity analysis and discuss how it may be applied to the Aimsun mesoscopic model. The webinar is based on a paper presented at the 2013 TRB Annual Meeting that explains how sensitivity analysis can be applied to a traffic simulation model. Participants must register in advance of the webinar, and there is a fee for non-TRB Sponsor or non-TRB Sustaining Affiliate employees. A certificate for two Professional Development Hours (PDHs) will be provided to attendees who register and attend the webinar as an individual.

Webinar Presenter

Biagio Ciuffo, European Commission – Joint Research Centre
Moderated by: George List, North Carolina State University

Webinar Outline

PART 1: Introduction to the TRB SimSub group
PART 2: Metamodel-based technique for model sensitivity analysis and how it can be applied to the Aimsun mesoscopic model
PART 3: Question and answer session
The first 60 minutes of the webinar will be for presentations and the final 30 minutes will be reserved for audience questions.

Registration Information

There is no fee for employees of TRB Sponsors or TRB Sustaining Affiliates who register using their work email address. In addition to employees of TRB sponsor organizations, the following are eligible to receive complimentary webinar registration: TRB and National Academies employees; Chairs of TRB standing committees, sections, or groups; CRP panel members who were involved with developing the report or project that is the subject of the webinar; Members of the media; Employees of tribal governments; and Members of Congress or their staff. Other sites must pay $89 per site. View our pricing page for details. After registering you will receive a confirmation email containing information about joining the webinar.

Professional Development Hour Information

A certificate for 1.5 Professional Development Hours (PDHs) will be provided to Professional Engineers (PEs) who register and attend the webinar as an individual. For groups, only the person that registers and attends the session will receive a PDH certificate. Individuals registered as Florida PEs are required to email Reggie Gillum, RGillum@nas.edu, with their license number. Please check with your licensing board to ensure that TRB webinar PDHs are approved by your board.

2014 Simulation Events

International Symposium of Transport Simulation, and the International Workshop on Traffic Data Collection and its Standardisation

Ajaccio, Corsica (France)
June 1-4, 2014

About the events

Following the success of the previous editions of both the International Symposia of Transport Simulation (ISTS) and the International Workshop on Traffic Data Collection and its Standardisation (IWTDCS), ISTS'14 and IWTCDS'14 aim to gather the world's transportation and traffic academics and practitioners, as well as people who are interested in contributing to or gaining a deeper understanding of the transport simulation field.

During the three-day conference plenary sessions featuring high level speakers and interactive breakout sessions will take place at the Conference Centre of Ajaccio (Corsica, France), where participants will have the opportunity to mingle with those at the forefront of data collection and standardisation, transport simulation thought, practice, and implementation as well as exchange experience and best practices. This event will focus on scientific challenges and issues raised by new theoretical development in the transport fields as well as new advances in Mobility Data collection and smart processing tools.

ISTS & IWTDCS
June 1-4, 2014 * Ajaccio, Corsica (France)

The organiser

The ISTS'14 and IWTCDS'14 is organised by the Transport and Traffic Engineering Laboratory (LICIT), a joint Research Lab. of ENTPE (the Post-graduate School of Civil Engineering & Sustainable Development) and IFSTTAR (a state-financed Research Institute in the areas of Transportation, Urban and Civil Engineering, Construction Materials and Natural Hazards). Within IFSTTAR, the LICIT is one of the 12 laboratories of the Components & Systems (COSYS) Department.

Established in 1993, the LICIT is recognized for its work in traffic modelling and engineering. The laboratory has already developed many successful applications for a real-time traffic information, network monitoring & management (including weather -sensitive traffic management), traffic simulation and dynamic assessment of the environmental impacts of transportation systems. For more information, please visit the Lab's website.

Register now and take advantage of early-bird registration discounts until March 15th, 2014.

Sponsored by: ENTPE, OPTIMUM, IFSTTAR

2014 Simulation Events

The 5th International Conference on Ambient Systems, Networks and Technologies (ANT-2014)

The 3rd International Workshop on Agent-based Mobility, Traffic and Transportation Models, Methodologies and Applications (ABMTRANS'14)

http://www.uhasselt.be/UH/datasim/ABMTRANS.html

in conjunction with ANT-2014 conference
Hasselt, Belgium (2—5 June 2014)

The 3rd International Workshop on Agent-based Mobility, Traffic and Transportation Models, Methodologies and Applications (ABMTRANS 2014) provides an international forum on the latest technologies and research in the field of traffic and transportation modeling using an agent-based approach. ABMTRANS 2014 is organized in the context of the European FP7 project DATASIM (http://www.datasim-fp7.eu/). ABMTRANS 2014 will be held in Hasselt, Belgium (2-5 June 2014) in conjunction with The 5th International Conference on Ambient Systems, Networks and Technologies (ANT-2014).

Transportation Research Institute (IMOB)
Hasselt University
Wetenschapspark 5 bus 6
B-3590 Diepenbeek, Belgium

2014 Simulation Events

SCOPE

This workshop provides a multidisciplinary collaborative forum for researchers and practitioners to submit papers presenting new research results and novel ideas related to the theory or the practice of agent-based traffic and transportation modeling. This workshop also invites researchers to submit their work focusing on the data mining, management and configuration for agent-based traffic and transportation modeling.

Topics of interest include (but are not limited to):

- Agent-based modeling and simulation
- Agent-human interactions
- Environment modeling and interaction protocols
- Data mining, learning and adaptation
- Marketing decision support
- Collaboration, cooperation, competition, coalitions in traffic and transportation models
- Agent-based negotiation of QoS and SLAs in traffic and transportation models
- Social and emergent behavior in MAS-T (multi-agent systems applied to traffic and transport)
- Large scale simulation of agent-based microscopic traffic models
- Calibration and validation of agent-based models for traffic and transportation
- Role of multi-agent methodologies for complex systems
- Conceptual modeling of agent-based approach
- Agent-based freight transportation modeling
- Multi-modal routing of agents in a dynamic traffic environment
  Agent-based scheduling to establish synthetic agenda for day-to-day activities

SUBMISSION AND PROCEEDINGS

All papers accepted for workshops will be included in the ANT-2014 proceedings, which will be published by Elsevier. The authors must follow Elsevier guidelines as given in ANT-2014 website (http://cs-conferences.acadiau.ca/ant-14/). The number of pages for workshop papers is limited to 6 pages. Authors should submit their contributions electronically in PDF format at: https://www.easychair.org/conferences/?conf=abmtrans2014.

The submission processes will be managed by easychair.org. If you have used this system before, you can use the same username and password. If this is your first time using EasyChair, you will need to register for an account by clicking "I have no EasyChair account" button. Upon completion of registration, you will get a notification email from the system and you are ready for submitting your paper. You can upload and re-upload the paper to the system by the submission due date.

The selective outstanding papers presented at the workshops, after further revision, will be considered for publication in journals special issues. In case of any problem with submission, please contact the workshop chair for assistance.

All workshops accepted papers will be printed in the conference proceedings published by Elsevier Science in the open-access Procedia Computer Science series (on-line). Procedia Computer Sciences is hosted on www.Elsevier.com and on Elsevier content platform ScienceDirect (http://www.sciencedirect.com), and will be freely available worldwide. All papers in Procedia will also be indexed by Scopus (http://www.scopus.com) and Engineering Village (Ei) (http://www.engineeringvillage.com). This includes EI Compendex (http://www.ei.org/compendex). All accepted papers will also be indexed in DBLP (http://dblp.uni-trier.de/).

The selective outstanding papers presented at the workshops, after further revision, will be considered for publication in journals special issues at ANT'14.

IMPORTANT DATES

- Submission due: 28 January, 2014.
- Notification of acceptance: 1 March, 2014.
- Camera-ready due: 1 April, 2014.
- Workshop: 2– 5 June, 2014.

2014 Simulation Events

PROGRAM COMMITTEE

- Tom Bellemans, IMOB - Hasselt University (Belgium)
- Davy Janssens, IMOB - Hasselt University (Belgium)
- Bruno Kochan, IMOB - Hasselt University (Belgium)
- Reinhilde D'Hulst, VITO (Belgium)
- Fjo Deridder, VITO (Belgium)
- Tom Holvoet, Katholieke Universiteit Leuven (Belgium)
- Rutger Claes, Katholieke Universiteit Leuven (Belgium)
- Davy Preuveneers, Katholieke Universiteit Leuven (Belgium)
- Ghasan Bhatti, OKTAL - University of Toulouse (France)
- Stephane Galland, UTBM (France) Nicolas Gaud, UTBM (France)
- Fabrice Marchal, CNRS (France)
- Theo Arentze, Eindhoven University of Technology (the Netherlands)
- Harry Timmermans, Eindhoven University of Technology (the Netherlands)
- Marco Luetzenberger, DAI-Labor (Germany)
- Anders Peterson, Linkoping University (Sweden)
- Paul Davidsson, Malmo University (Sweden)
- Rashid A. Waraich, ETH Zurich (Switzerland)
- Phuc V. Nguyen, Arkansas State University (USA)
- Daniel Keren, University of Haifa (Israel)
- Irith Ben-Arroyo Hartman, University of Haifa (Israel)
- David Yang, Federal Highway Administration, U.S. Department of Transportation (USA)
- Matthew Roorda, University of Toronto (Canada)
- Kai Nagel, TU Berlin (Germany)
- Oded Cats, KTH Stockholm (Sweden)
- Johan Holmgren, Blekinge Institute of Technology (Sweden)
- Michal Jakob, Czech Technical University (Czech Republic)

REGISTRATION

Please visit: http://cs-conferences.acadiau.ca/ant-14/#registration for more information.

VENUE, ACCOMMODATION & VISA REQUIREMENTS

Please visit: http://cs-conferences.acadiau.ca/ant-14/#conferenceVenue for more information.

WORKSHOP ORGANIZERS

Dr. Ansar-Ul-Haque Yasar Transportation Research Institute Hasselt University, Belgium ansar.yasar@uhasselt.be	ir. Luk Knapen Transportation Research Institute Hasselt University, Belgium luk.knapen@uhasselt.be

If you have any further questions please contact one of the workshop organizers.

2014 Simulation Events

ANT-2014—Modeling and Simulation in Transportation Sciences

The 5th International Conference on Ambient Systems, Networks and Technologies (ANT-2014)

(Track on Modeling and Simulation in Transportation Science)

http://cs-conferences.acadiau.ca/ant-14/
Hasselt, Belgium (2 –5 June 2014)

The 5th International Conference on Ambient Systems, Networks and Technologies (ANT-2014) is a leading international conference for researchers and industry practitioners to share their new ideas, original research results and practical development experiences from all Ambient Systems, Networks and Technologies related areas. The ANT-2014 will be held in conjunction with the International Conference on Sustainable Energy Information Technology (SEIT)).

ANT 2014 will be held in the city of Hasselt. Hasselt was founded in approximately the 7th century on the Helbeek, a small tributary of the Demer river. The name Hasselt came from *Hasaluth*, which means hazel wood. Hasselt is an old yet modern city which is home to multiple academic institutions and where visitors can enjoy a variety of activities and entertainment. ANT 2014 is co-organized & co-hosted by the Hasselt University, Belgium.

Transportation Research Institute (IMOB)
Hasselt University
Wetenschapspark 5 bus 6
B-3590 Diepenbeek, Belgium

2014 Simulation Events

SCOPE

The goal of the **ANT-2014** conference is to provide an international forum for scientists, engineers, and managers in academia, industry, and government to address recent research results and to present and discuss their ideas, theories, technologies, systems, tools, applications, work in progress and experiences on all theoretical and practical issues arising in the ambient systems paradigm, infrastructures, models, and technologies that have significant contributions to the advancement of ambient systems theory, practices and their applications.

At ANT-2014, there is a dedicated track on ***Modeling and Simulation in Transportation Sciences (MSTS)*** organized by the *Transportation Research Institute (IMOB), Hasselt University, Belgium*. This aim of this track is to bring together communities interested in the computation, knowledge discovery and technology policy aspects of transportation systems. The organizers of ANT-2014 (MSTS track) welcomes papers from researchers in the domains of transportation sciences and engineering, computer science, urban and regional planning, civil engineering, geography, geo-informatics and related disciplines to submit papers for consideration for presentation and for publication in the conference proceedings.

Topics of interest in the MSTS track include (but are not limited to):

- **Collaborative transport, including collaborative multi-modal transport**
- **Data mining and statistical learning for travel information**
- **Human factors including adaptive driving, travel behavior, persuasive technology**
- **Human-computer interfaces in intelligent transportation applications**
- **Logistics and transportation management**
- **Mathematical optimization in traffic engineering**
- **Novel applications targeted to health, mobility, liveability and sustainability**
- **Renewable energy sources in transportation**
- **Simulation of traffic, passenger flows, assisted driving or collaborative transport**
- **Social and institutional information related to travel**
- **Traffic flow and transportation model**
- **Travel information, including recommender systems and user feedback systems**
- **Uncertain information in collaborative transport and assisted traveling**

SUBMISSION AND PROCEEDINGS

All ANT-2014 accepted papers will be printed in the conference proceedings published by Elsevier Science in the open-access Procedia Computer Science series (on-line). Procedia Computer Sciences is hosted on www.Elsevier.com and on Elsevier content platform ScienceDirect (www.sciencedirect.com), and will be freely available worldwide. All papers in Procedia will also be indexed by Scopus (www.scopus.com) and Engineering Village (Ei) (www.engineeringvillage.com). This includes EI Compendex (www.ei.org/compendex). The papers will contain linked references, XML versions and citable DOI numbers. You will be able to provide a hyperlink to all delegates and direct your conference website visitors to your proceedings. All accepted papers will also be indexed in DBLP (http://dblp.uni-trier.de/).

Submitted technical papers must be no longer than 8 pages for full papers and 5 pages for short papers including all figures, tables and references.

Authors are requested to submit their papers electronically using the online conference management system in PDF format before the deadline (see Important Dates).

The submission processes will be managed by easychair.org. If you have used this system before, you can use the same username and password. If this is your first time using EasyChair, you will need to register for an account by clicking "I have no EasyChair account" button. Upon completion of registration, you will get a notification email from the system and you are ready for submitting your paper. You can upload and re-upload the paper to the system by the submission due date.

IMPORTANT DATES

- Submission due: 4 January, 2014.
- Notification of acceptance: 1 March, 2014.
- Camera-ready due: 4 April, 2014.
- Conference: 2—5 June, 2014.

2014 Simulation Events

PROGRAM COMMITTEE (MSTS Track)

- Tom Bellemans, IMOB - Hasselt University (Belgium)
- Davy Janssens, IMOB - Hasselt University (Belgium)
- Bruno Kochan, IMOB - Hasselt University (Belgium)
- Reinhilde D'Hulst, VITO (Belgium)
- Fjo Deridder, VITO (Belgium)
- Tom Holvoet, Katholieke Universiteit Leuven (Belgium)
- Rutger Claes, Katholieke Universiteit Leuven (Belgium)
- Davy Preuveneers, Katholieke Universiteit Leuven (Belgium)
- Ghasan Bhatti, OKTAL - University of Toulouse (France)
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- Theo Arentze, Eindhoven University of Technology (the Netherlands)
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- Marco Luetzenberger, DAI-Labor (Germany)
- Anders Peterson, Linkoping University (Sweden)
- Paul Davidsson, Malmo University (Sweden)
- Rashid A. Waraich, ETH Zurich (Switzerland)
- Phuc V. Nguyen, Arkansas State University (USA)
- Daniel Keren, University of Haifa (Israel)
- Irith Ben-Arroyo Hartman, University of Haifa (Israel)
- David Yang, Federal Highway Administration, U.S. Department of Transportation (USA)
- Matthew Roorda, University of Toronto (Canada)
- Kai Nagel, TU Berlin (Germany)
- Oded Cats, KTH Stockholm (Sweden)
- Johan Holmgren, Blekinge Institute of Technology (Sweden)
- Michal Jakob, Czech Technical University (Czech Republic)

REGISTRATION

Please visit: http://cs-conferences.acadiau.ca/ant-14/#registration for more information.

VENUE, ACCOMMODATION & VISA REQUIREMENTS

Please visit: http://cs-conferences.acadiau.ca/ant-14/#conferenceVenue for more information.

PROGRAM VICE-CHAIRS

Prof. dr. Davy Janssens Transportation Research Institute Hasselt University, Belgium davy.janssens@uhasselt.be	Prof. dr. Tom Bellemans Transportation Research Institute Hasselt University, Belgium tom.bellemans@uhasselt.be	Prof. dr. Harry Timmermans Technical University Eindhoven The Netherlands h.j.p.timmermans@tue.nl

If you have any further questions please contact one of the program vice-chairs.

You may also visit our website (*http://cs-conferences.acadiau.ca/ant-14/*) for more details.

2014 Simulation Events

Institute of Transportation Engineers
FLORIDA SECTION
DISTRICT 10

2014 FSITE Winter Workshop
Traffic Analysis Tools and Specialized Applications

The Florida Section of ITE is pleased to announce the 2014 Winter Workshop on ***Traffic Analysis Tools and Specialized Applications***. The workshop will provide an overview of the latest updates for some popular analytical tools in Florida. New applications and emerging concepts will be discussed. Specific topics include:

- Guidance and framework for traffic analysis in FDOT's upcoming Traffic Analysis Handbook.
- FHWA's Traffic Analysis Toolbox and upcoming guideline revisions for applying micro-simulation software.
- Updates to 2010 HCS including the incorporation of new HCM chapters on alternative intersections, reliability and managed lanes.
- Advanced arterial analysis in Synchro/SimTraffic including alternatives intersection/interchanges, roundabouts and adaptive signal control.
- Self-calibration and sensitivity analysis in CORSIM
- Multi-resolution modeling in VISUM/VISSIM - integrating macro-, meso-, and micro-simulation models.
- Active Traffic Management modeling for freeways.

When: February 20, 2014

Where: Florida's Turnpike Enterprise Headquarters, Auditorium B
Turkey Lake Service Plaza, MP 265
Ocoee, FL 34761

Time: 10:00 AM to 4:00 PM

Target Audience:

The target audience for the workshop is transportation planners within MPOs and local, county and state organizations, transportation engineers, and traffic analysts.

PDH/AICP Credits: 6.0 hours

Registration Costs:
FDOT Employees = Free
Member = $60
Non-Member = $70
Retired Member = $40
Retired Non-Member = $50
Student = $30

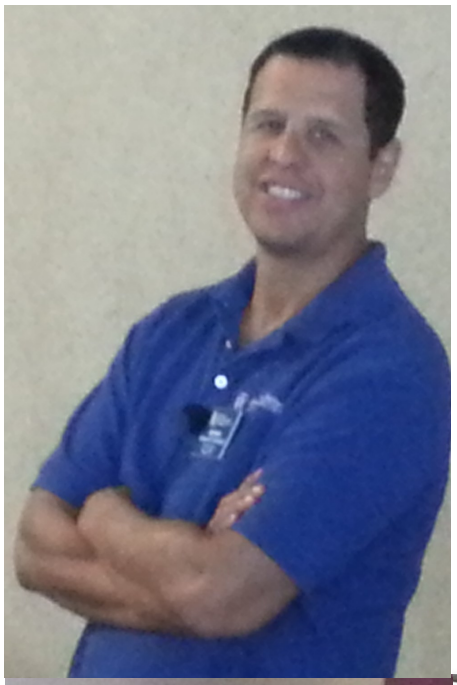
Registration include lunch and refreshments

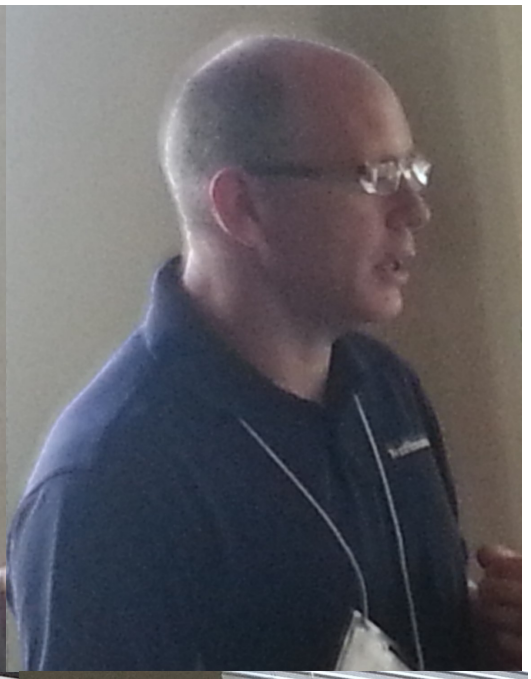
FDOT employees can purchase lunch at the door.

Don't miss this opportunity to learn about the latest practices!

2014 Simulation Events

Andrew Velasquez (FDOT, FSITE), organizer and moderator
Bill Sampson (McTrans), discussing HCM updates
Michael Trueblood (Trafficware), discussing alternative intersections
Derek Miura (FHWA), discussing planning for ATDM
Steve Perone (PTV America), discussing multi-resolution modeling
Thomas Bauer (Traffic Technology Solutions), discussing ATM strategies







2014 Simulation Events

OR ITE Simulation Roundtable Webinar: Panel Discussion - Analysis Tools, Design Hours, and Other Needs to Know

Thursday, June 5, 2014

11:30 AM - 1:00 PM PDT

REGISTER NOW

Join us for a Webinar on June 5

The OR ITE Simulation Roundtable will be hosting a panel discussion to discuss different analysis tools, what design hours we should be analyzing and building for and other needs to know related to analyzing and designing traffic networks. The questions will consider the differences between cities and rural areas as well the importance of bicycles, pedestrians and transit in the equation. Panel members include:

Doug Mclanahan, WSDOT
Miranda Wells, HDR
Peter Koonce, PBOT
Scott Harmon, DEA

The panel discussion is being held at DEA Headquarters in Portland, OR. In person attendees will get priority on questions, but webinar attendees will still be able to ask questions. You may also submit questions ahead of time to: oritesimulationroundtable@gmail.com.

System Requirements
PC-based attendees
Required: Windows® 8, 7, Vista, XP or 2003 Server

Mac®-based attendees
Required: Mac OS® X 10.6 or newer

Mobile attendees
Required: iPhone®, iPad®, Android™ phone or Android tablet

Reserve your Webinar seat now at:
https://www1.gotomeeting.com/register/924163009

by Ximiao Jiang (FHWA R&D), Qijian Gan (UC Irvine), Joe Bared (FHWA R&D), Michael Maness (Univ. of Maryland), and David Hale (Leidos, Inc.)

Traffic Performance Analysis of Dynamic Merge Control using Micro-Simulation

Ximiao Jiang
FHWA Research Scholar

Dynamic merge control (DMC) can be used in freeway merge areas to dynamically change lane allocation at interchanges. It generally prioritizes the facility having higher volume, and closes a lane on the lesser-volume roadway. DMC has been implemented in the Netherlands and Germany, where it was reported that the application of DMC significantly improved traffic operations. However the DMC strategy has rarely been studied, and has not been implemented in the US. This research employed micro-simulation studies using VISSIM, to investigate efficiency of the DMC strategy. Optimum traffic demand thresholds were specifically sought for the geometric case where a 2-lane freeway merges with a 3-lane freeway, and tapers into 4-lanes. In addition to the microscopic analysis, a state-of-art macroscopic lane changing model was employed, to further evaluate DMC benefits. Major-road traffic demands between 2500 and 4600 vehicles per hour (vph) were compared against minor-road demands between 3000 and 4600 vph. The DMC strategy was applied by closing the right lane of the major road, ahead of the merging gore area. The results indicate that: 1) the DMC strategy is beneficial for all abovementioned traffic demand combinations, in terms of average vehicle delay and average vehicle speed; 2) when traffic demand on the minor road exceeds 1900 vehicles per hour per lane (vphpl), these benefits become statistically and practically significant; and 3) DMC can greatly alleviate the capacity reductions caused by lane changing in the merge area.

In response to the growing traffic congestion issue, an increasing number of active traffic management (ATM) strategies have been developed and implemented internationally. Among these strategies are hard shoulder running, variable speed limits (VSL), queue warning, dynamic truck restrictions, managed lanes, and dynamic rerouting & traveler information. These ATM strategies are capable of monitoring traffic flow; and can dynamically control speeds, add capacity, and inform road users of network conditions, to optimize traffic and safety performance.

Of these strategies, dynamic junction control (DJC) represents a component of the ATM system. It can be used at freeway off-ramps and on-ramps, to dynamically change lane allocation for interchanges. The rationale for use is that, in some traffic conditions or during certain times of day, it may be more effective to use existing downstream or upstream lanes for one type of movement or for traffic coming from the main lanes while at other times of day it may be more effective to use the through lanes for the ramp movement (Mirshahi, et al. 2007).

One major component of DJC strategies is the dynamic merge control (DMC). When ramp volumes are relatively light, or when mainline volumes are heavy, it may be most effective to have an entrance ramp merge into the rightmost lane. However, there may be times that the volume on the ramp is extremely high while the mainline volumes are low. In this case, traffic merging from the on-ramp will have to find gaps in the mainline traffic, despite the mainline traffic being relatively light. The delay caused by hesitation and time required to find a gap may be disruptive to ramp capacities and flows, thus creating a situation with higher rear-end collision potential on the ramp. The DMC strategy is currently implemented in Germany and the Netherlands; where lane control signs are installed over both approaches upstream of the merge, and priority is given to the facility with higher volume. This strategy produces a more uniform traffic flow, with fewer conflicts and safer maneuvers (Helleman, 2010).

Despite the advantages of DMC there is no current implementation in the US, and no known publication discussing this strategy. In other words, knowledge of DMC is still experimental in nature. A

by Ximiao Jiang (FHWA R&D), Qijian Gan (UC Irvine), Joe Bared (FHWA R&D), Michael Maness (Univ. of Maryland), and David Hale (Leidos, Inc.)

study conducted by Parsons Brinckerhoff (PB) and the Texas Transportation Institute (TTI) (2009) suggested certain conditions should be met before applying DMC. These conditions include: (1) Level of service (LOS) F on entrance ramps for 2 consecutive peak hours in the peak direction, during AM and PM peak periods; (2) Over 1,200 vehicles per hour (vph) on a single-lane on-ramp, or over 2,000 vph on a two-lane on-ramp; (3) LOS D or better on the upstream mainline lanes following implementation of DMC. Research conducted by TTI (2011) suggested it is preferable to have at least 900 vph on the single-lane on-ramp, and LOS E or better on the mainline lanes following DMC implementation.

The abovementioned DMC is used to "close" the right lane of the mainline upstream of the on-ramp to give ramp traffic free-flow conditions onto the mainline. This strategy can be generalized to prioritize high-volume roadways by dropping a lane on the lower-volume roadway, especially in merge areas involving a downstream lane drop. Lane drops in the merge area can easily cause a bottleneck, leading to upstream congestion on both roads. In this situation, closing a lane on the lower-volume road would reduce or eliminate the friction caused by "weaving" (gap acceptance) movements in the merge area. As such, the DMC strategy is hypothesized to reduce traffic congestion at the merge of two freeways.

The objective of this paper is to investigate DMC efficiency where 3-lane and 2-lane freeways merge into 4 lanes, and explore optimum thresholds for activating and deactivating DMC. The remainder of this paper is organized as follows: (1) Describe the methodology of this study, (2) explore optimum operation thresholds for DMC (2-lane and 3-lane freeways merging into 4 lanes) using micro-simulation, (3) examine the sensitivity of simulation results to the desired safety distance parameter, (4) validate the microscopic simulation-based results using a state-of-art macroscopic lane changing model, and (5) discuss research results and conclusions drawn. To explore DMC efficiency for the general case of freeway-to-freeway merging, a series of simulation studies were conducted on a hypothetical freeway facility. Figure 1 shows a sketch of the hypothetical road geometry and lane closure strategy.

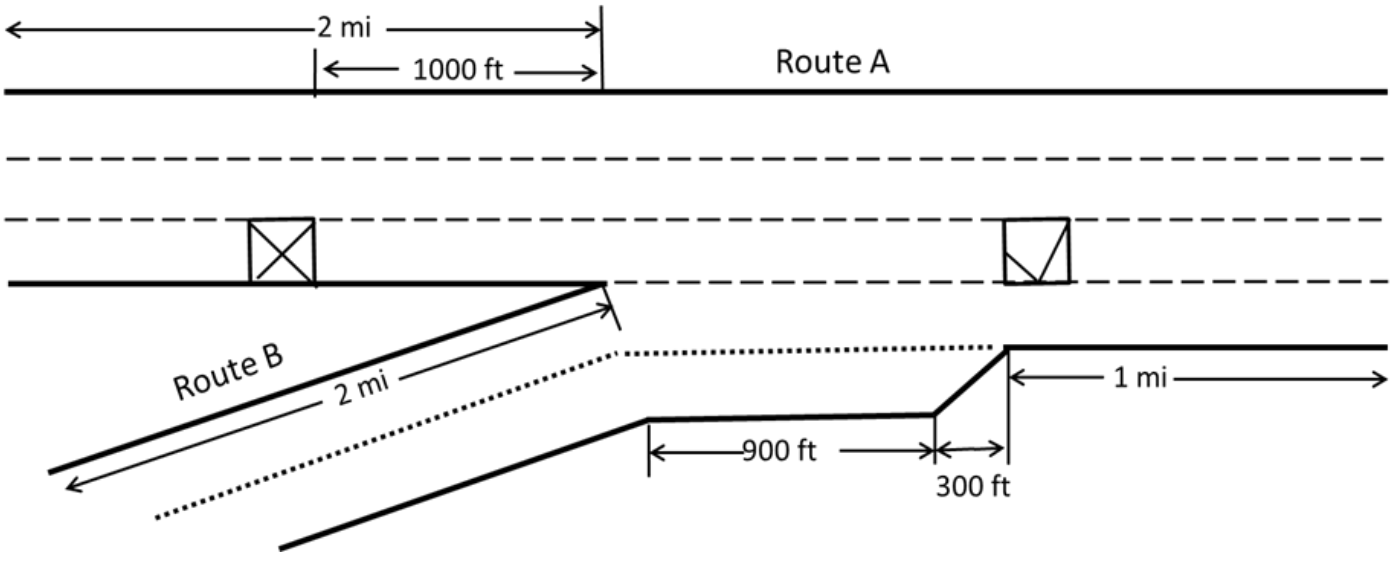


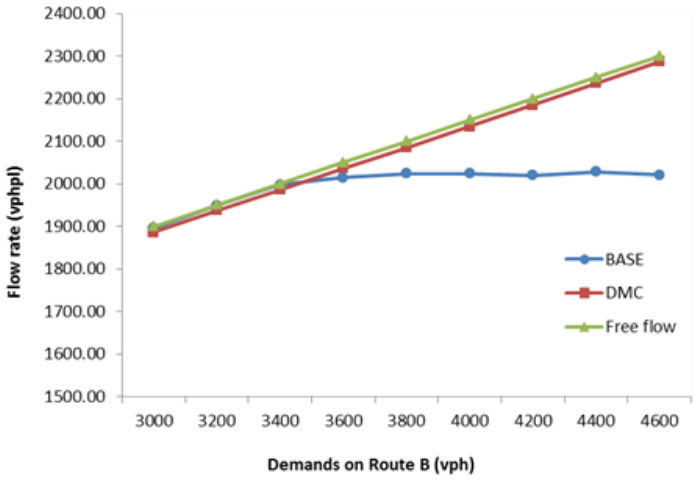
Figure 1: Sketch of the hypothetical road geometry and the lane closure strategy.

by Ximiao Jiang (FHWA R&D), Qijian Gan (UC Irvine), Joe Bared (FHWA R&D), Michael Maness (Univ. of Maryland), and David Hale (Leidos, Inc.)

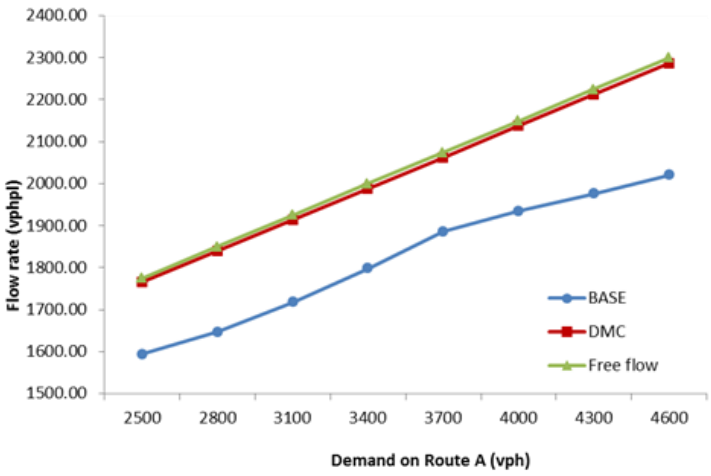
To explore optimum DMC operation thresholds, traffic demands on Route A were varied from 2500 to 4600 vehicles per hour (vph), in increments of 300 vph. Simultaneously, demands on Route B were varied from 3000 to 4600 vph in increments of 200 vph. Thus with 8 demand levels on Route A and 9 levels on Route B, a total of 8*9=72 demand scenarios were analyzed. When closing a mainline lane, drivers were assumed notified of that lane closure 2500 ft upstream of the closing point. In the merge area, vehicles originating from the mainline were not allowed to make lane changes from lane 4 to lane 3, ensuring that ramp vehicles could freely merge onto the mainline.

The simulation period for each scenario was 8400 seconds, including 1200 seconds of initialization "warm-up" time. In each scenario, traffic demands on both roads were assumed fixed over the entire simulation period. To better understand the impact of lane changes on capacity, flow rates within 300 ft after the lane drop were investigated. Flow rates under free-flow conditions were calculated by dividing combined demand from Routes A and B by the total number of lanes (4 in the measured section). Figure 2a presents lane-drop-area flow rates for 4600 vehicles per hour (vph) on Route A, and various demands on Route B. Figure 2a indicates that Route B flow rates were very similar under DMC and free-flow conditions, for all considered traffic demands. However under baseline conditions, when demands on Route B exceed 3600 vph, flow rates remain capped at around 2000 vphpl. This implies that without DMC control, merge-area capacity is constrained by lane changing disturbances. Figure 2b presents lane-drop-area flow rates for 4600 vph in Route B, and various demands on Route A. Figure 2b shows nearly identical Route A flow rates between DMC and free-flow conditions, with baseline flow rates consistently 150-200 vphpl lower.

The research presented was constrained to a specific set of geometric and traffic conditions, and the study was solely based on simulation work. Although DMC has not been implemented in the US, field experiments are desired to validate the proposed strategy. Moreover, the current study closed a lane approximately 1000 ft upstream of the merge gore, and informed drivers 2500 ft upstream. The next phase of this study will investigate varying lane closing locations, and varying distances to inform drivers. Furthermore, the current research assumes a 100% compliance ratio when closing a lane. In the next phase, various compliance ratios shall be evaluated.



(a) Fixed demand on Route A at 4600 vph



(b) Fixed demand on Route B at 4600 vph

Figure 2: Flow rate analysis in the merge area.

400 South Corridor Assessment

By: Milan Zlatkovic & Ivana Tasic
University of Utah
Marija Ostojic & Aleksandar Stevanovic
Florida Atlantic University

This study evaluated current and future traffic and transit performance along the light rail transit (LRT) corridors within the University of Utah area, 400 South and Downtown Salt Lake City before and after an introduction of an additional LRT line. The analysis was performed using VISSIM microsimulation coupled with Siemens NextPhase Software-in-the-Loop traffic controllers, and it included measures of effectiveness (MOE) on different levels, such as vehicular and LRT travel times, detailed intersection performance, network-wide performance, and person-based MOEs. Three main scenarios were developed for this purpose: the Baseline scenario, with the existing LRT lines; the Black Line scenario, which introduced the additional Black Line along the main corridor; and the Black Line scenario with Enhancements, which included recommendation for improving signal timing and priority settings at certain intersections. All these models were evaluated for three different target years: current year, 2020 and 2025. Additional modeled scenarios included alternative intersection configuration, with modified left turn operations at intersections of 400 S and Main, 400 S and State, and 400 S and 700 E.

The analysis showed that the additional LRT line did not have significant impacts on traffic and transit operations. The highest impacts were experienced at intersections closed to the Downtown area, mainly 400 S and State Street, and 400 S and Main Street, at intersections in the University area, including South Campus and Mario Capecchi, Wasatch Drive and Mario Capecchi, and intersection of N Temple and 400 W in the downtown area. The study also looked at potential places where certain improvements can be implemented to minimize these impacts. After

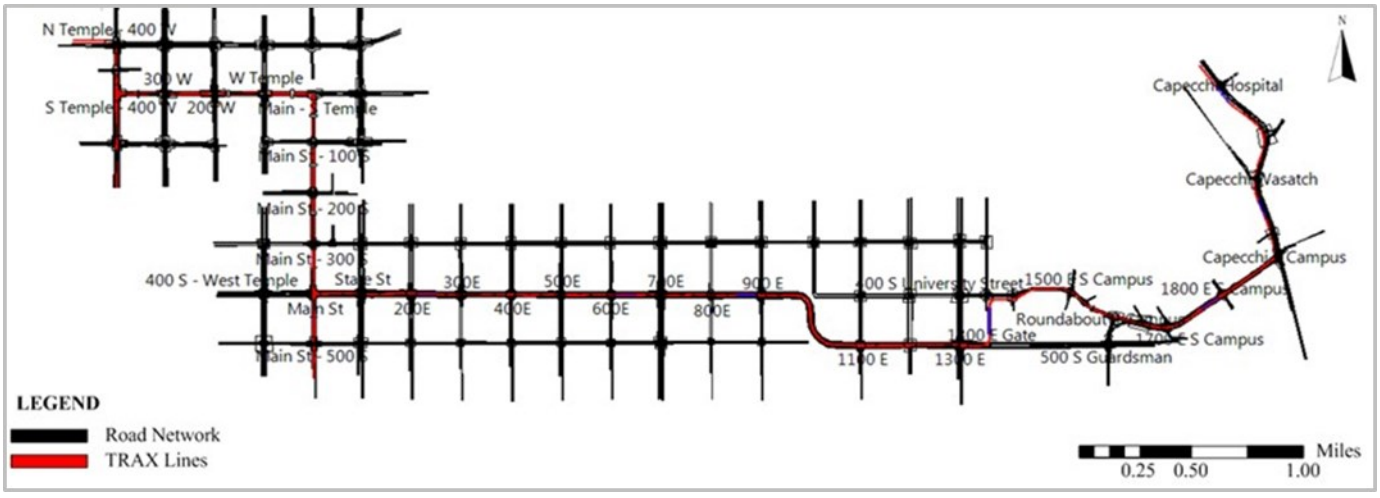


Figure 1: Roadway and LRT Study Network

the detailed analysis, three improvement strategies are recommended to be considered for implementation. The first strategy is to change the phase sequence at 400 S and Main Street intersection, so that the LRT movements are served in conjunction with vehicular through movements, and to perform signal parameter optimization. The second recommendation is to modify the preemption settings for the intersection of N Temple and 400 W, and it included transition to free running operations and modifying the exit phases. Going into the free mode and modifying the exit phases eliminates the need for transition after increased preemption called with the new

Figure 2: Main Street and 400 S Intersection in Simulation

line in place, and the results showed benefits for side streets, left turns and pedestrians. The third recommendation is to optimize signal timing parameters for intersections of South Campus and Mario Capecchi, and Mario Capecchi and Wasatch Drive based on the field data. Also, based on the results for alternative intersection configuration, it might be beneficial to remove the shared lane sites at intersections of 400 S with State Street and 700 E, since these left turns do not operate in the optimal way. Currently, the drivers are hesitant to use the shared lane, so close to 70% are using the non-shared left turn lane, which causes very low utilization for left turns. Removal of the shared lanes and optimization of signal timings significantly helps LRT and helps reduce impacts for vehicular traffic.

In the following phases, the study will expand to the neighboring areas of Downtown and the 400 S corridors, to assess the effects of the LRT and streetcar lines, and recommend remedies to alleviate any negative effects. Additional signal timing solutions could be proposed for intersections that remained without improvements after the proposed optimization. Coordinating vehicular and TRAX performance with pedestrian and bicyclists needs, especially in downtown and upper campus area, would be beneficial as the future research effort. The person-based analysis is shown to be beneficial, and future research efforts will be focused on optimizing these parameters.

This study was coordinated between UDOT, Utah Transit Authority, and other agencies. For more information, please contact Milan Zlatkovic from the University of Utah's Traffic Lab (milan@trafficlab.utah.edu) or Kevin Nichol of the UDOT Research Division (knichol@utah.gov).

Calibration of Work Zone Impact Analysis Software for Missouri

by Praveen Edara, Ph.D., P.E., PTOE,
Carlos Sun, Ph.D., P.E., JD,
and Zhongyuan (Eric) Zhu

University of Missouri-Columbia

This project calibrated two software programs used for estimating the traffic impacts of work zones. The WZ Spreadsheet and VISSIM programs were recommended in a previous study by the authors. The programs were calibrated using field data from two work zones in Missouri. Both work zones involved a single lane closure on a three-lane section of roadway. The I-44 work zone was a long-term work zone, while the I-70 work zone was temporary, lasting only a few hours. The capacity values required for calibration were similar for the two programs: 1,575 veh/hr/ln for the WZ Spreadsheet and 1,514 veh/hr/ln for VISSIM. The VISSIM driving behavior parameters CC1, CC2, and SRF were also computed. The study found that a calibration based on delay or travel time exhibited better overall performance than a calibration based on queue length.

In the future, additional case studies could be added to further calibrate the two models. Such studies could involve different work zone lane configurations, e.g., a one-lane closure on a two-lane segment, a two-lane closure on a three-lane segment, etc. Obtaining the data needed for calibration can be challenging. In order to avoid congestion in urban areas, MoDOT makes an effort to close lanes only during off-peak hours or at night. Thus, finding work zone sites that result in queuing and delays is a challenge. To facilitate future calibration efforts, the current study makes the following recommendations:

1) When travel time monitoring equipment such as Bluetooth is deployed, travel time upstream of the work zone taper should be measured if possible. Work zone analysis software compute queuing and delays as a result of capacity reduction starting at the taper. Thus, software can be calibrated only if data are available upstream of the work zone taper. However, the primary purpose of Bluetooth monitoring is to inform drivers of the travel time through the work zone or between two points of interest near the work zone - not necessarily to report travel time to reach the taper. In such situations, deploying one additional Bluetooth unit near the taper is recommended to obtain the data necessary for calibration.

2) The use of private sector data (e.g., INRIX) for travel times and queue length could generate a sufficiently large sample of work zones to use for calibration. However, such data should first be validated using ground truth, since such data are still relatively new and have not been fully validated.

MoDOT
Final Report Prepared for Missouri Department of Transportation
2013 December Project TRyy1306 Report cmr14-004

2014 Research Results

Replication of Work Zone Capacity Values in a Simulation Model

by I. Chatterjee, P. Edara, and C. Sun, University of Missouri–Columbia; and S. Menneni, PTV America

Transportation Research Record: Journal of the Transportation Research Board, No. 2130, Transportation Research Board of the National Academies, Washington, D.C., 2009, pp. 138–148.

Evaluating the traffic impacts of work zones is vital for any transportation agency to plan and schedule work activity. Traffic impacts can be estimated by using microscopic simulation models. One challenge in using these software models is obtaining the desired work zone capacity values, which tend to vary from state to state. Thus, the default parameter values in the model that are suitable for normal traffic conditions are unsuitable for work zone conditions, let alone for conditions specific to particular states. Although a few studies have been conducted on parameter selection to obtain desired capacity values, none of them have provided a convenient look-up table (or chart) for the parameter values that will replicate field-observed capacities. Without such provision it has not been possible for state agencies to use any of the research recommendations. This study provides the practitioner a simple method for choosing appropriate values of driving behavior parameters in the VISSIM microsimulation model to match the desired field capacity for work zones operating in a typical early-merge system. The two most significant car-following parameters and one lane-changing parameter were selected and varied to obtain different work zone capacity values. CC1 is the desired time headway, CC2 is the longitudinal following threshold during a following process, and the safety distance reduction factor is representative of lane-changing aggressiveness. It has been verified that the recommended parameter values not only produce the desired capacities but also create traffic conditions consistent with traffic flow theory.

Departments of transportation (DOTs) in the United States face the challenge of scheduling road construction and maintenance activities with as little traffic impact as possible. Traffic impacts include safety concerns, travel delays, and air pollution. Typically, construction and maintenance activities involve single or multiple lane closures for a certain duration of time. The scheduling of lane closures and work activity is done primarily based on the expected length of queues at the work zone. Traffic engineers determine the expected queues on the basis of a combination of their past experience and analysis tools. Analysis tools such as QUEWZ, QuickZone, and CA4PRS as well as custom spreadsheet models use a deterministic queuing model to compute the queue lengths, a procedure documented in the *Highway Capacity Manual* (HCM 2000). The core input for the analytical tools is the value of lane capacity.

Traffic simulation tools arrive at queue lengths on the basis of car-following and lane-changing models. Unlike the analytical tools, for the microsimulation mod-

els capacity is not a direct input, but rather a measure that is a result of driver behavior. Other studies, for example, Birst et al. have compared different traffic simulation models with the HCM 2000 methodology. The present study focuses on the use of simulation to model work zones and does not include the use of any analytical tools.

Simulation tools are being increasingly adopted by DOTs for various traffic analysis studies, including assessing work zone traffic impacts. This is due, in part, to their ability to model individual vehicle and driver behavior at a highly detailed level to assess traffic performance. In order to accurately use the simulation models for traffic analysis of work zones, the models must be calibrated to match the field conditions (such as lane capacity and queue lengths) by adjusting the driving behavior parameters. Unfortunately, there is little guidance on choosing the driving behavior parameters in simulation models that will replicate the actual field conditions in work zones.

Roadway capacities at work zones are lower than the capacities under normal operating conditions. Furthermore, empirical studies have shown that these reduced capacity values are not uniform across all states (see Table 1). This disparity means that a unique driving behavior parameter set cannot be used by all states; instead, the parameter values should be chosen so as to reproduce the state-specific capacity values.

The following conclusions were drawn from this research effort:

- This study provides the practitioner a simple method for choosing appropriate values of driving behavior parameters in the VISSIM microsimulation model to match the state-specific desired capacity for work zones operating in a typical early-merge system. To apply this method, a transportation agency with the knowledge of lane distribution at specific points upstream from the work zone chooses a unique set of driving behavior parameters from the table to match the observed capacity.
- Capacity values resulting from the chosen driving behavior parameter ranges were found to be

TABLE 1 Variation of Roadway Capacities Across States

State	Two Lanes to One	Three Lanes to One	Unit	Source
Texas	1,340	1,170	vphpl	Dudek and Richards (*3*)
North Carolina	1,690	1,640	vphpl	Dixon et al. (*4*)
Connecticut	1,500–1,800	1,500–1,800	vphpl	Sarasua et al. (*5*)
Missouri	1,240	960	vphpl	Missouri DOT (*6*)
Nevada	1,375–1,400	1,375–1,400	vphpl	Sarasua et al. (*5*)
Oregon	1,400–1,600	1,400–1,600	pcphpl	Sarasua et al. (*5*)
South Carolina	950	950	vphpl	Sarasua et al. (*5*)
Washington	1,350	1,350	vphpl	Sarasua et al. (*5*)
Wisconsin	1,600–2,000	1,600–2,000	pcphpl	Sarasua et al. (*5*)
Florida	1,800	1,800	vphpl	Elefteriadou et al. (*7*)
Virginia	1,300		vphpl	Virginia DOT
Iowa	1,400–1,600		pcphpl	Maze et al. (*8*)

NOTE: vphpl = vehicles per hour per lane and pcphpl = passenger cars per hour per lane.

between 1,200 and 2,100 vphpl for both two-to-one and three-to-two lane configurations except for a few instances. In order to obtain capacities outside this interval (<1,200 or >2,100 vphpl) either the parameter ranges have to be extended or additional parameters, such as CC0 and lane-changing deceleration thresholds, have to be explored. However, this could result in an unrealistic car-following and lane-changing driver behavior.

- In this study, although the input demand was fixed at 3,000 and 5,000 vph for the two-to-one and three-to-two configurations, respectively, the resulting capacity is not a function of this demand as long as the demand is sufficiently high to generate queues. Nevertheless, queue lengths will depend on the demand, and they can be recorded from the simulation model with the use of parameters recommended in the charts.
- With selection of the appropriate driver behavior parameters from the developed charts, the impact of variables such as work zone intensity and lane width reduction on work zone capacity can also be modeled. For example, if the impact of lane width reduction on capacity has been quantified on the basis of empirical studies, the corresponding set of parameters for the reduced capacity can be obtained from the charts developed in this paper.
- To further facilitate the use of the results the authors are developing a spreadsheet macro in which the look-up process is automated. The smart spreadsheet will be made available for free download upon its completion.

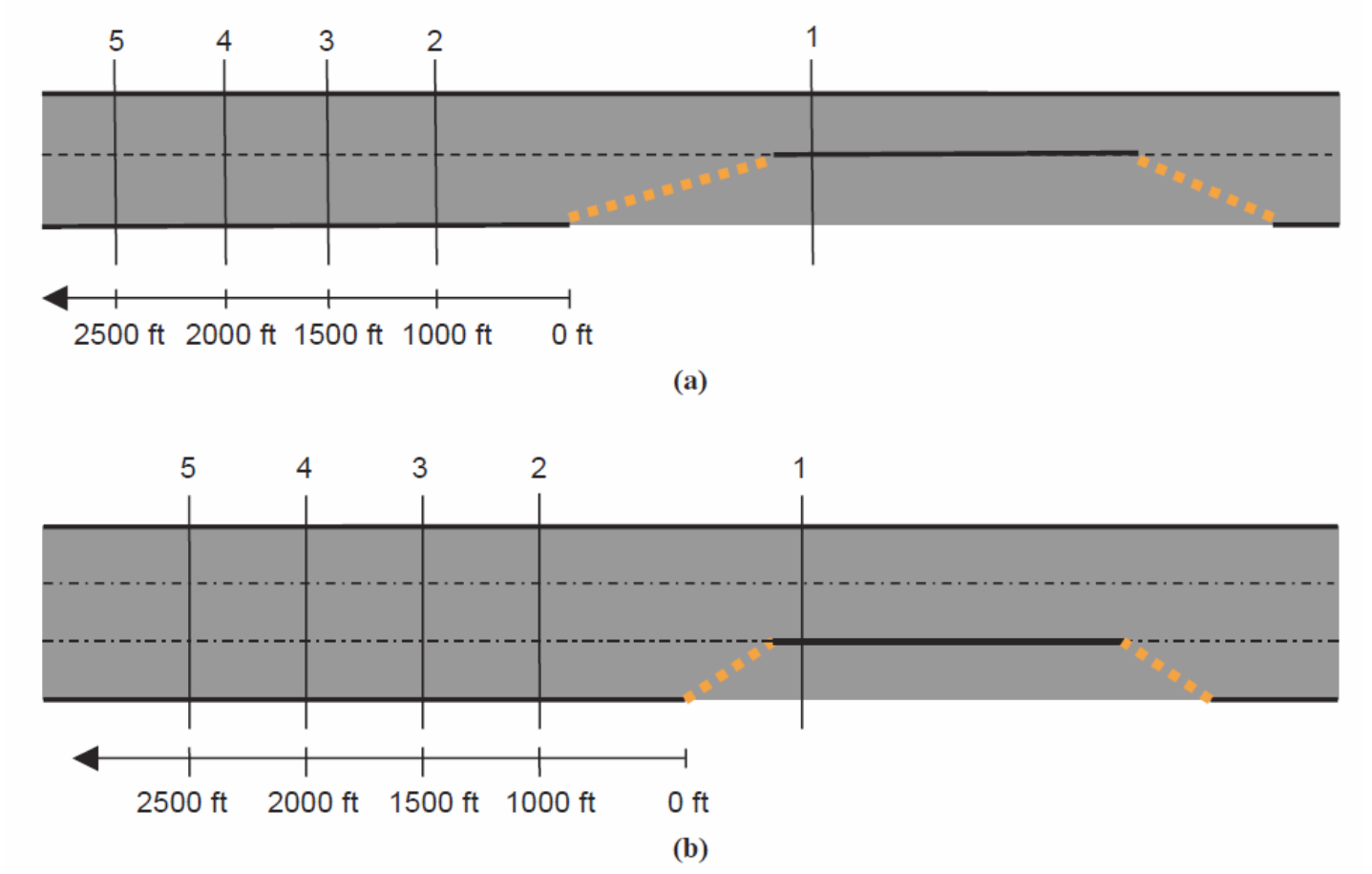


FIGURE 1 Layout of data collection points for (*a*) two-to-one and (*b*) three-to-two work zone lane configurations (figure not to scale).

2014 Simulation Analyses

Using Micro-Simulation to Evaluate Potential Traffic Impact of Proposed Widening of a Major Interstate Highway

by Anindya Chakraborty, P.E., MSCE

Lead Engineer (Traffic/ Transportation), Close, Jensen and Miller PC

Project Description

For many years the Connecticut DOT, the public, and regional planning agencies recognized that I-84 between Danbury (New York State line) and Waterbury in Connecticut has some serious problems (see Figure 1). Traffic volumes have exceeded anticipated levels and operating speeds have dropped considerably, leading to severe congestion in the mainline, which clogged the intervening ramps and spilled over to the arterial roadways, creating traffic bottlenecks. I-84 was designed in the 1950s to carry approximately 30,000 to 90,000 vehicles per day. Currently some sections of this highway are congested with as much as 125,000 vehicles per day. In response to these concerns, studies were performed in the corridor between Exits 1 and 18 and recommendations were made for capacity enhancement throughout the corridor. To assess impacts of these recommendations on the general environment and establish a preferred design alternative, an Environmental Impact Statement (EIS) was performed in accordance with The National Environmental Policy Act of 1969 (NEPA). The EIS was initiated with federal funding with FHWA and CTDOT acting as lead agencies. A steering committee comprising of officials from local planning agencies and municipalities was constituted to represent stakeholders in the project. A public outreach program was also planned. A detailed traffic micro-simulation model, using TSIS/CORSIM software was constructed as part of the transportation impact analysis in the EIS. Several alternatives for the corridor were considered and modeled and the preferred alternative consisted of addition of one full lane in each direction of I-84 from New York State line to Waterbury along with interchange re-configurations, new secondary roadways as well as intersection improvements in the existing secondary roadway system.

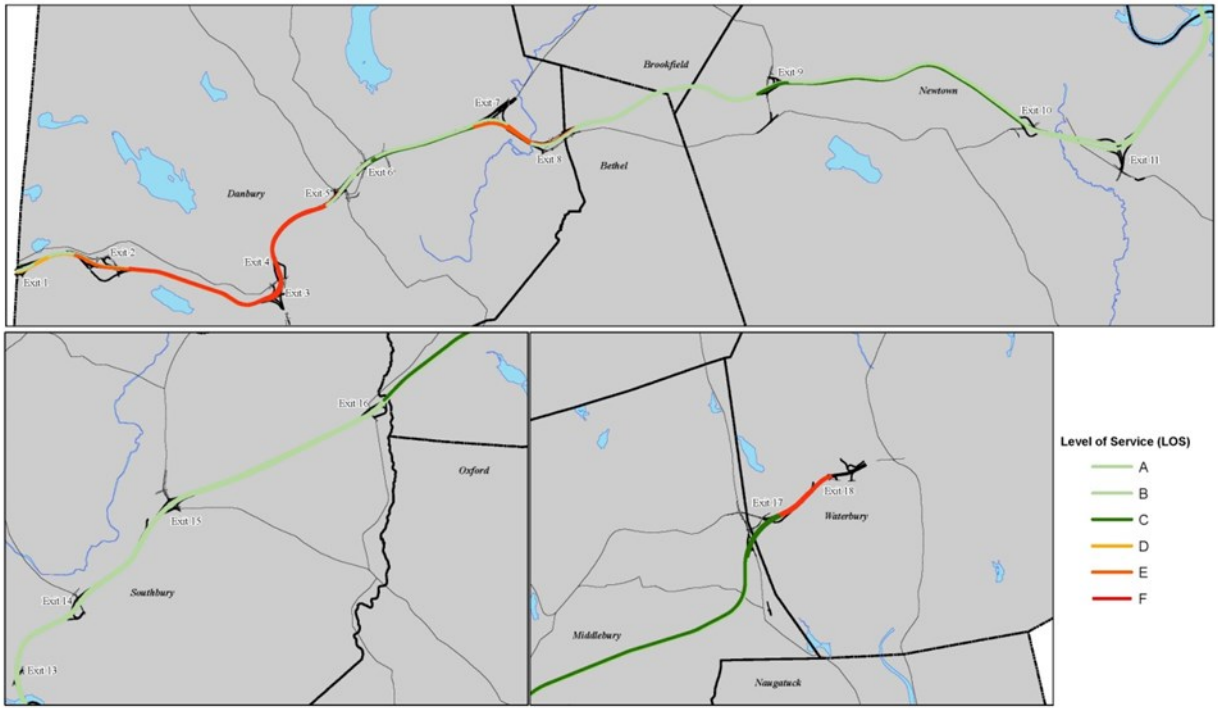


Figure 1: Existing Traffic Operating Conditions

2014 Simulation Analyses

Simulation Model Development and Analysis Methodology

To assess highway system performance under proposed alternative "Build" over future "No-Build", the following analysis tasks were developed:

- Develop the CORSIM link-node model
- Traffic data collection and analysis
- Develop model for Existing Condition
- Develop model for future "No-Build" Condition
- Validation and calibration of Existing and "No-Build" conditions, including error checking
- Proposed Build condition analysis
- Develop of Measures of Effectiveness (MOEs) and comparison
- Findings and Conclusions

The study corridor included a 32-mile mainline extending from Connecticut/New York State line to Waterbury, 32 ramp junctions, 53 signalized and 25 un-signalized intersections. Figure 2 illustrates the link-node model. Traffic volume information was collected from CTDOT for the entire corridor during AM and PM peak hours. It was observed that traffic patterns were commuter-centric, with WB I-84 being heavier during the AM peak due to high volume of commuters to New York, while during the PM peak the pattern is reversed. A horizon year of 2035 was selected and CTDOT Statewide Travel Demand Model was used to obtain future volumes. CORSIM is based on a link-node network model. Links represent roadway segments while nodes mark a change in the roadway, intersection or entry points. CORSIM was developed and maintained by Federal Highway Administration (FHWA) and is run within a software environment called the Traffic Software Integrated System (TSIS), which provides an integrated Windows environment for executing the model. A key element of TSIS is the TRAFVU output processor, which allows the analyst to view the network graphically and assess its performance using animation.

Capacity is a numerical determinant of the ability of a specific roadway, intersection or freeway to accommodate traffic. Level-of-Service (LOS) is a qualitative descriptor of highway efficiency in processing vehicular traffic and is dependent on various factors including speed, driving comfort, convenience and also delay. LOS "A", "B" and "C" reflect clearly acceptable conditions, LOS "D" reflects existence of delays within a generally tolerable range, LOS "E" is generally tolerated only in minor movements and LOS "F" typically indicating undesirable delays, often associated with breakdown conditions.

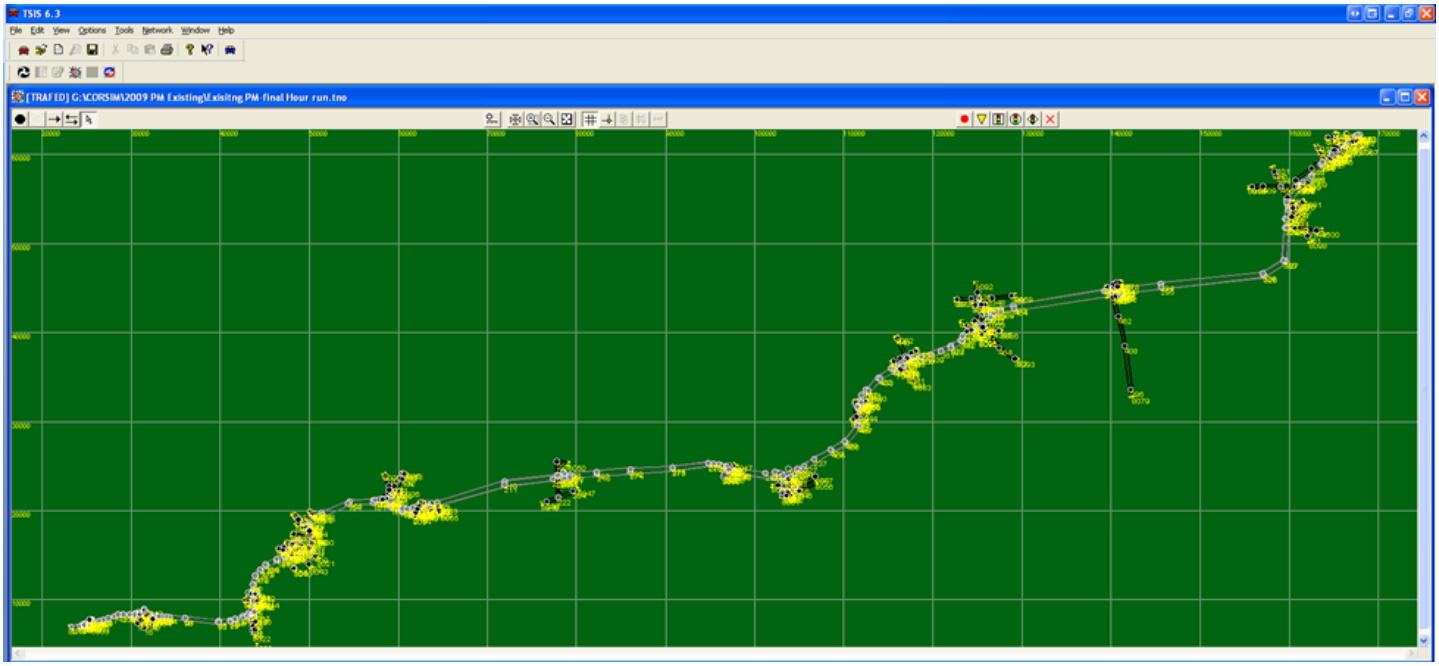


Figure 2: CORSIM Link-Node Model

2014 Simulation Analyses

Simulation Analysis and Results

The simulation was run for multiple time periods and multiple random number seeds and average results were determined. Synchro/SimTraffic was used to model signalized intersections of secondary roadways and recommend improvements like signal timing/phasing changes and/or geometric improvements. Comparing simulation results for the existing conditions with the future "No-Build" conditions revealed unacceptable operating conditions at multiple freeway segments, ramp junctions and intersections (see Figure 3). Further comparison of future "No-Build" conditions to the "Build" condition, with addition of a general purpose lane in both directions of I-84 and interchange reconfigurations showed that all highway elements would operate at LOS "D" or better (see Figure 4). The traffic analysis results have been reviewed and accepted by CTDOT and FHWA.

Conclusions and Project Status

The section of I-84 between the New York State line and Waterbury area was constructed in the 1960s and 1970s as part of the Federal Interstate Highway System. Regionally, I-84 is a crucial east-west transportation corridor, linking southern New England to New York and eastern Pennsylvania and provides connections to other major interstates such as I-90 in Massachussetts, I-87 (New York State Thruway) and I-684 in New York and I-80 and I-380 in Pennsylvania. Being the pivotal transportation route for interstate traffic through Connecticut, the proposed improvements have immense potential of improving travel times in this corridor and by extension provide an impetus to the regional economy. However, due to current funding issues, CTDOT has decided to prioritize the improvements, breaking the corridor down to several segments and focus on the Danbury area in particular to execute interchange reconfigurations. Currently modeling efforts are underway to ascertain the feasibilities of such smaller projects and determine their corresponding impacts.

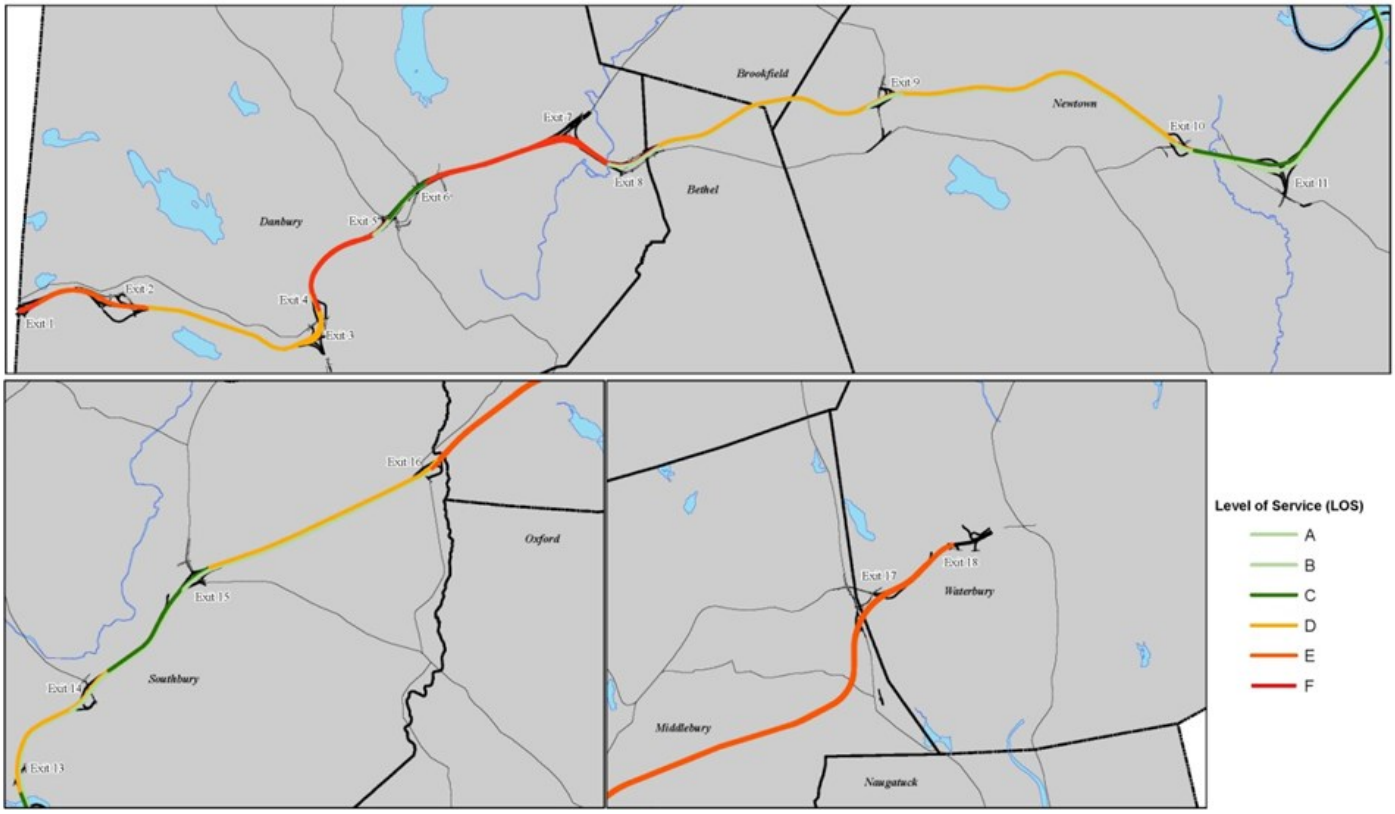


Figure 3: No-Build Traffic Operating Conditions

2014 Simulation Analyses

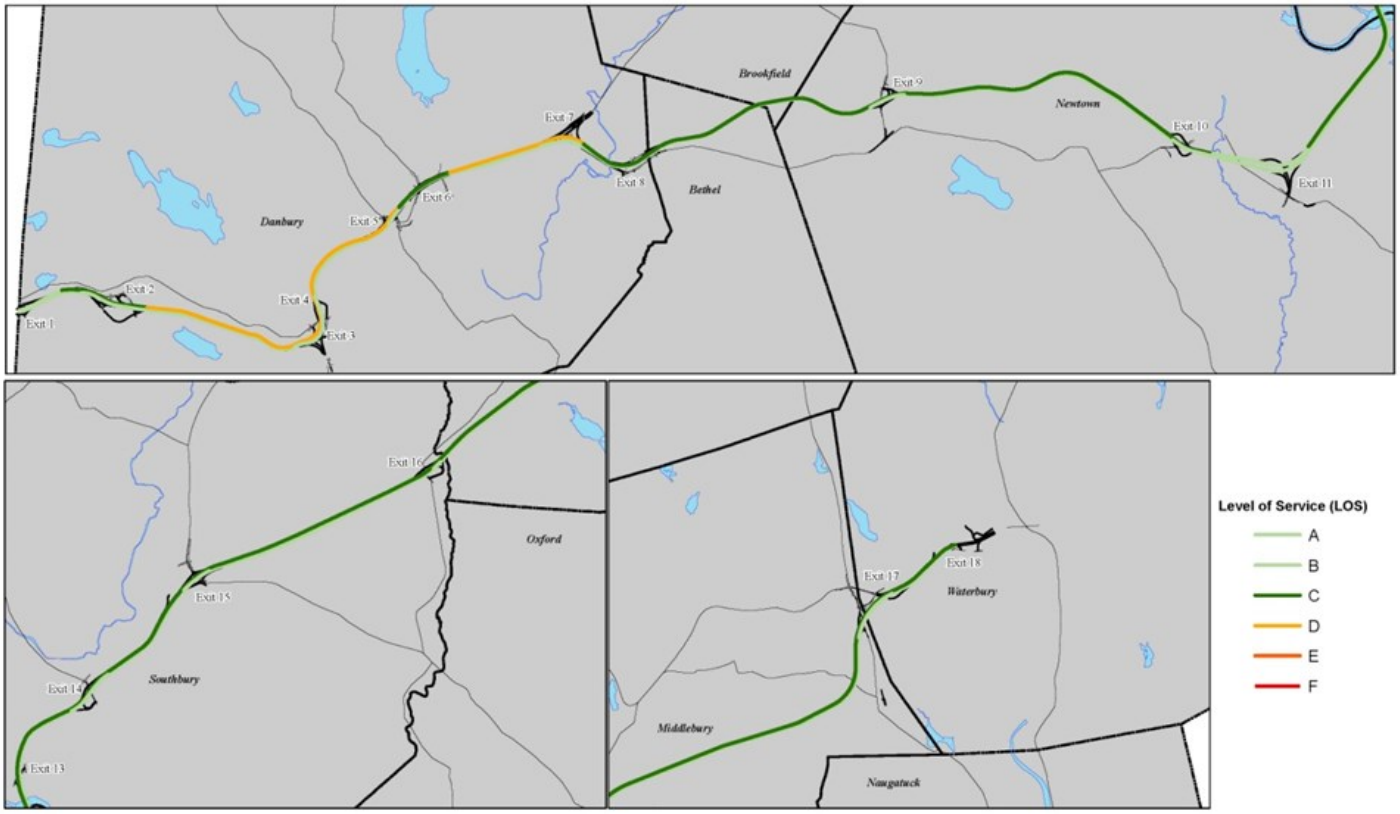


Figure 4: Build Traffic Operating Conditions

2014 Simulation Analyses

Using Micro-Simulation to Evaluate the Potential Traffic Impact of Proposed Removal of Street Cutting-Through Central Park

by Pong Wu, Transportation Planner and John Adams, Transportation Technical Director, Richland County Regional Planning Commission

RCRPC

I. Project Description

The Central Park located in the center of the City of Mansfield, Ohio was about three acres in area. In 1958 the Park Avenue cutting-through from Central Park was constructed by public vote for mitigating the CBD areas' traffic congestion and gaining more parking spaces. The Park Ave., since then, becomes an east-west, four-lane divided arterial serving the CBD area with an ADT at 27,400. The areas on North and South of Central Park became a one-aisle parking space respectively (Figure-1).

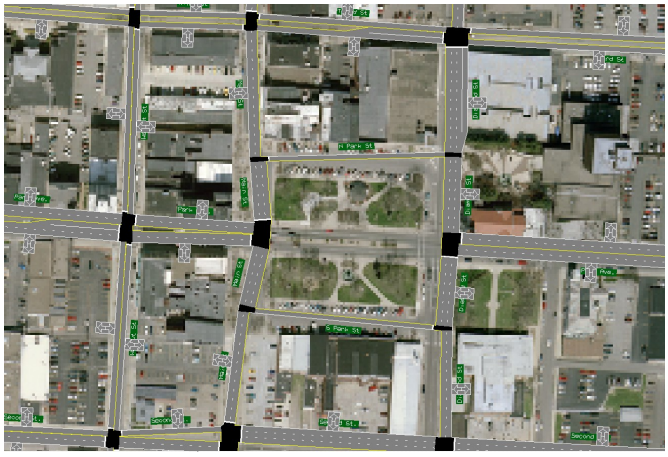


Figure-1

Beginning from 2011, there is a concerning by local groups to restore the Central Park back to its original layout it had before the year of 1958 and keeping the parking spaces on both north and south of the Park as it is now currently.

Meanwhile, one another concerns by other local groups about the plans to reunify Central Park is whether the removal of Park Avenue from Central Park would result in any impacts on operational performance to the nearby streets surrounding Central Park. To provide decision makers and stakeholders involved with information on how traffic operates and travelers will respond to system changes and potential traffic impacts to the surrounding streets under the "Build" alternative, Richland County Regional Planning Commission (RCRPC), the designated Metropolitan Planning Organization for the region's transportation planning and study, was requested by stakeholders to perform a potential traffic impact study using modeling analysis and simulation tools Cube/Voyager and TSIS/CORSIM.

II. Simulation Model Development and Analysis Methodology

To identify how traffic operates and travelers respond to system changes under proposed alternative "Build" condition over current "No-Build" condition, following tasks for simulation analysis were developed:

a. Identifying the extents of the study area
b. Traffic data collection and analysis
c. Existing "No-Build" conditions model development
d. Validation and calibration of existing "No-Build" conditions including error checking
e. Proposed "Build" condition analysis and comparison
f. Safety performance simulation
g. Findings and Conclusion of Simulation Study

The study area identified for traffic impact and simulation analysis covers all major functionally classified roadways with including 42 signalized intersections and 6 non-signalized intersections surrounding

the proposed development. Traffic turning movements for all intersections in the study area were counted and the identified PM peak hour traffic and intersections' peak hour factors were used in the simulation modeling. The CORSIM'S network was converted from SYNCHRO created years ago for a similar downtown traffic study. Figure-2 illustrates the modeling network in the study area.

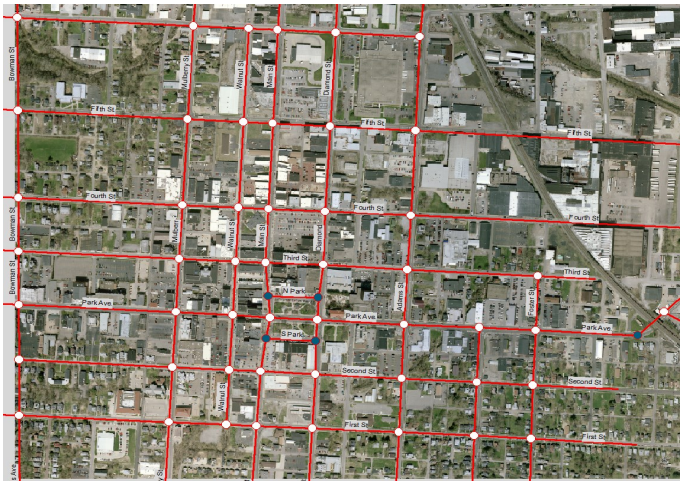


Figure-2

The traffic impact analysis is performed in accordance with the City of Mansfield standards using the Highway Capacity Manual (HCM) methodology. The Level of Service (LOS) "D" or better is desirable in both the City of Mansfield and the MPO's urbanized area. LOS "E" and "F" are considered to be unacceptable or deficient.

III. Simulation Analysis and results

As mentioned, the tools used in this traffic impact analysis including CUBE/Voyager for static trip path assignment and LOS analysis identifying changes of trips traversing a specific link or a preferred path between networks with and without Park Avenue at study area. And, the CORSIM for dynamic traffic assignment evaluating traffic flows in a network, which result from the decisions of individual travelers seeking for the best paths en-route over a given area and result in the changes of MOE indicating the state of traffic flow in the network, such as average speed, Travel time, stop delay etc. under Build and No-Build conditions. Comparing with the running results of CORSIM simulation between existing network (No-Build Condition) and proposed removal of Park Avenue from Central Park (Build), the traffic conditions on some streets under Build do show increases in traffic volumes and the deterioration in level of service at study area surrounding the proposed project as Park Avenue is one of region's major arterials handling significant portion of traffic in the downtown area. Figure-3 shows the simulation result of traffic condition under "No-Build" scenario and Figure-4 shows the simulation results of traffic impacts to the surrounding streets in the network under "Build" scenario and the deterioration of LOS. Table-1 summarizes the simulation results from Build and No-Build conditions.

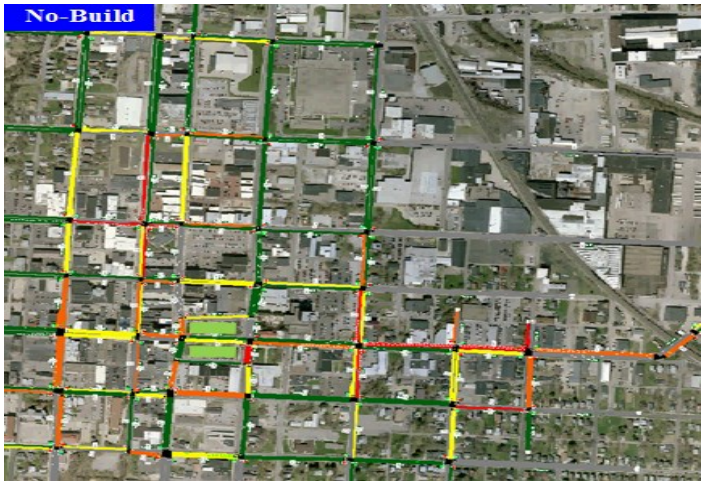


Figure-3

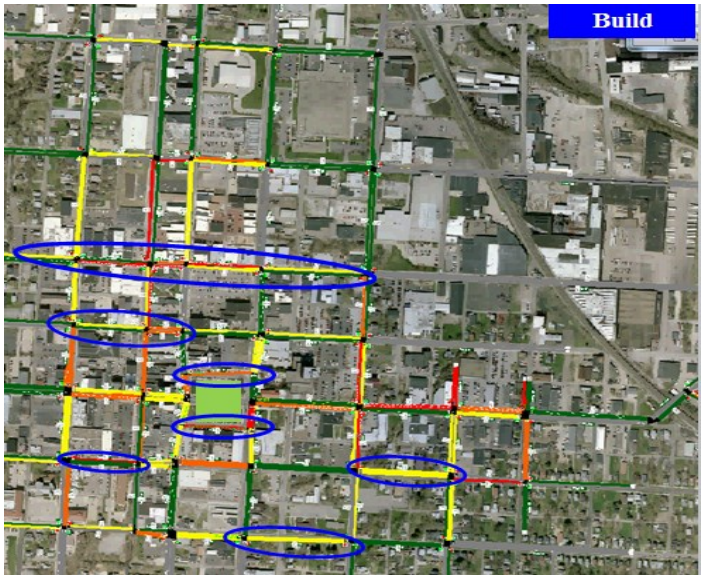


Figure-4

The Roadway Lovel of Service (LOS)

Comparing Average Speed (Cumulative) Under Scnario No-Build Vs. Build

(East-West Direction)

Street Segment		Bowman-Mulberry		Mulberry-Walnut		Walnut-Main		Main-Diamond		Diamond-Admas	
		No-Build	Build	No-Build	Build	No-Build	Build	No-Build	Build	No-Build	Build
5th St.	West Bound	C	C	D	D	A/B	A/B	E	E	C	C
	East Bound	C	C	D	D	E	F	C	D	C	C
4th St.	West Bound	C	D	A/B	C	C	E	E	F	A/B	D
	East Bound	C	C	F	F	F	F	C	D	C	C
3RD St.	West Bound	C	C	C	D	C	E	D	D	D	D
	East Bound	C	C	A/B	C	E	E	C	C	C	C
N Park St.	West Bound							D	E		
Park Ave.	West Bound	C	C	D	D	E	D	C	Cut	C	C
	East Bound	C	C	D	E	A/B	D	D	Off	D	D
S Park St.	East Bound							C	F		
2nd St.	West Bound	C	C	D	F	C	D	E	E	C	C
	East Bound	E	D	C	C	D	D	E	E	C	C
1st St.	West Bound	C	C	D	D	A/B	C	D	D	C	D
	East Bound	D	D	A/B	A/B	E	E	D	D	C	D

Table-1

In the traffic impact analysis for proposed changes on Park Avenue, the CORSIM's safety performance simulation was also executed to identify potential traffic crashes influenced by a number of traffic and geometric factors. The CORSIM's safety simulation highlighting potentially unsafe traffic conditions is based on the reaction thresholds of the individual drivers and the distance between vehicles or traffic interactions between vehicles in a traffic stream. Figure-5 in the last page illustrates one of potential traffic crashes identified by CORSIM safety performance simulation under Build condition.

IV. Findings

Comparing simulated Build and No-Build results, the key findings of the traffic simulation analysis are as follows:

- There are some impacts on system performance and the state of traffic flow in study area's network when comparing Measures of Effectiveness (MOE) under Build and No-Build conditions;
- Traffic conditions deteriorated for some streets surrounding proposed removal of Park Avenue under Build network;
- Potential locations of incidents were identified with simulation model due to increased traffic and geometric factors;
- Both N. Park St (one aisle on North of Central Park) and S. Park St. (one aisle on South of Central Park) may need to be widened from their current one-lane one way to two-lane one way and upgrade their functional classification from current local streets to Arterial that matches the functional classification of surrounding streets at Central Park such as Main St., Diamond St. and Park Ave.;
- The Main St. between N. Park St. and S. Park St. may need to be straightened;
- The following issues and impacts identified by model or simulation model may need to be further and comprehensively studied by hiring private consulting firms. Those issues include:

1. Potential ROW and Capacity issues for 3rd Street, 4th Street
2. Street widening issues on N. Park St., and S. Park St.
3. Street straightening on Main St. (Between North and South Park St.), etc..

V. Conclusions

One of MPO's planning tasks in regional planning process is to make sure the mobility and roadway users' safety on maintained regional network with proposed street changes in the area. Use of simulation tool analyzing travel activities and visualizing dynamic network performance for potential or proposed transportation projects have increased significantly in transportation planning, and has helped the decision maker to make transportation decisions more reasonable. The simulation model creates a similar roadway network and transportation environment in the interested study area as to the real-world traffic condition observed on-street, and it provided a comprehensive view of the whole network; excellent for comparing and evaluating the network's traffic operation performance, such as traffic flows, intersection offsets, vehicle queues, etc. under different conditions proposed through planning process.

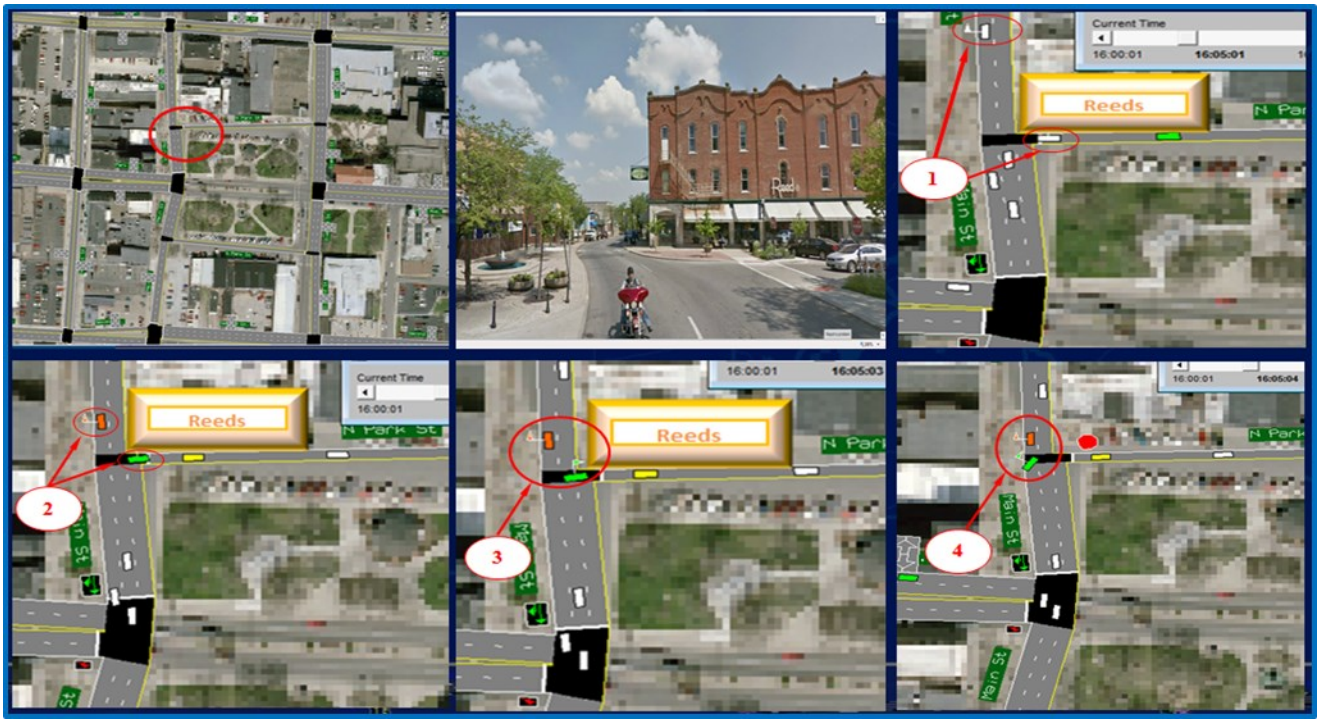


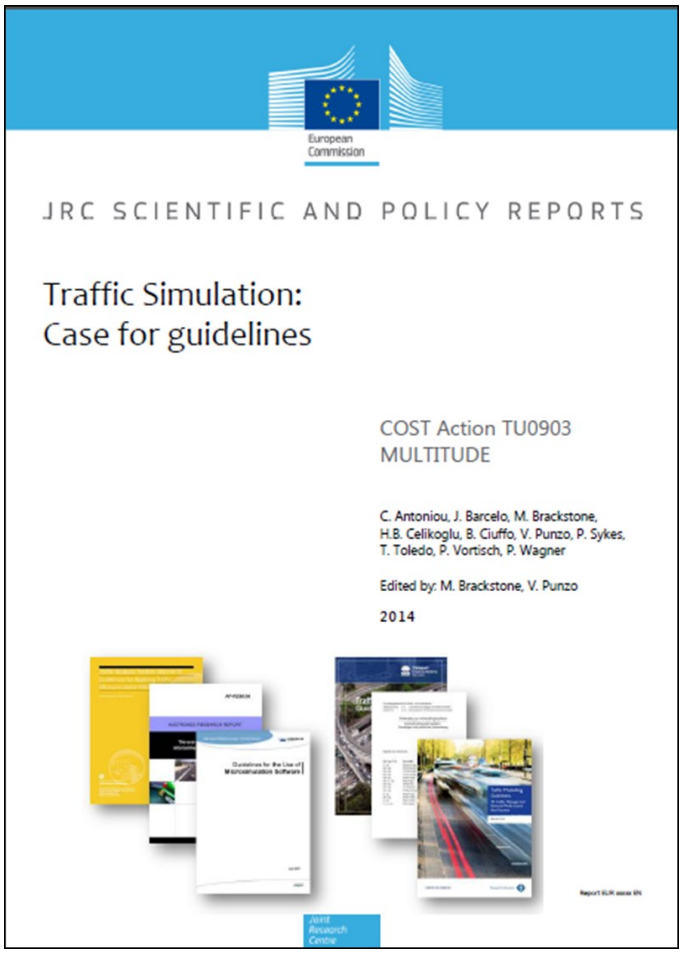
Figure-5

References

- TSIS/CORSIM Reference Manual
- TSIS/CORSIM User Guide
- Newsletters by TRB Joint Simulation Sub-Committee
- Dynamic Traffic Assignment: A Primer - *June 6, 2011 TRB Transportation Research E-Circular E-C153*
- Traffic Analysis Toolbox Volume IV: Guide-lines for Applying CORSIM Micro-simulation Modeling Software – *January 2007 FHWA-HOP -07-079*

Methods and tools for supporting the Use caLibration and validaTIon of Traffic simUlation moDEls

Official Release of the MULTITUDE Case for Guidelines



The MULTITUDE COST action concluded with its final conference in Naples in December 2013. The Case for Guidelines is now officially available here for download, through JRC press:

http://publications.jrc.ec.europa.eu/repository/handle/111111111/30680

Traffic Simulation: Case for Guidelines. Brackstone and Punzo (Eds.). JRC Scientific and Policy Report, EUR 26534 EN. European Commission, Luxembourg. 2014. ISBN 978-92-79-35578-3.

This document assesses the current situation regarding guidelines for traffic simulation model calibration and validation worldwide, discusses the problems currently faced, and suggests potential ways in which they can be addressed, both directly, and indirectly through the development of the overall field of traffic simulation as a whole.

Modelling Intelligent Mobility

Background

Intelligent Mobility (IM) is defined by the UK's Transport Systems Catapult as "the use of emerging technologies to enable the smarter, more sustainable, and more efficient movement of people and goods around the world". Encompassing everything from autonomous vehicles to seamless journey and ticketing systems, it is also a fast growing sector – with an estimated market value of more than £900bn per year by 2025. IM presents huge opportunities to use emerging technologies in the field of data and communications to better manage complex systems and transform how we manage our transport networks.

In order to turn this vision into reality, however, IM will require a range of modelling activities to support its growth and wider acceptance – and these activities will need to go far beyond traditional transport planning tools and methods. IM models will have to integrate systems that operate with real-time data, which can simulate synthetic environments, model human behaviour and human interactions, and which can also connect with other models focused on areas as diverse as land use, economics, the environment and climate. IM systems are intended to inform the traveller's experience and influence his or her travel decisions, often while their journey is still being made. They therefore need to provide transport networks with intelligent, integrated management capabilities which can be applied equally to the movement of people or freight, and to both public and private transport.

Due to their relative complexity, it is essential that projects built around Intelligent Mobility can be rigorously assessed before they are implemented on the grand scale. If the market is to grow as predicted, such projects will sometimes have to compete for investment with traditional schemes – often against a background of dwindling public and private funds. The developers of these systems will be turning to the transport modelling community, looking for the expertise to justify and support their policies or businesses. Transport models are well developed to assess traditional schemes but fail to adequately model many aspects of IM. The goal for the UK Transport Systems Catapult therefore is to develop a framework to support IM models using open standards for data exchange and incorporating flexible, functional boundaries. This framework will encourage entrants into the IM market by providing a simulation system where they can test their proposals for transport network and transport demand management.

Requirements for IM Models

The Transport Systems Catapult has identified four key requirements for IM models: first, in areas where existing models are already well established, the modelling platform must be capable of building on the existing software in order to use and re-use the best solutions; second, the platform must be extendable to enable new entrants into the market niches exposed by the needs of IM. These market niches lead on to the third requirement, the ability to model information systems and to model dynamic changes to trip planning, trip behaviour and traveller collaboration. The final requirement is that the platform needs to provide a decision support tool and also address the need to visualise, analyse, and understand both the behaviour of the individual traveller and the wider transport network.

The requirement to model information systems forces us to look at the value of information – a value which is dependent upon the information's accuracy, its timeliness and the reaction it evokes. This requires a modelling framework in which data is shareable between all components of the model, where the time granularity is such that short term actions and reactions can be modelled and where agents in the model can react to information individually targeted for them. This set of requirements leads us to agent-based activity models using micro-simulation models of the agents' tasks, with rich data exchange between the model components.

Agent-based models

An agent-based model simulates the daily activities

of a population of agents. An agent may be a traveller, a freight consignment, a household or a company, or even a management system or policy maker. The common factor is that each agent has a plan and seeks to maximise its "benefit" in executing that plan. Fig 1 shows the structure of a typical agent-based model where a simulation of the activity period – normally a 24hr day – is run with each agent following its plan. In subsequent model iterations, their plans are refined until the system converges on an optimised set of timed agent activities. The policy, management and demographics loop in the simulation is there to model the longer term actions of agents as they change the structure of their plan in response to the system.

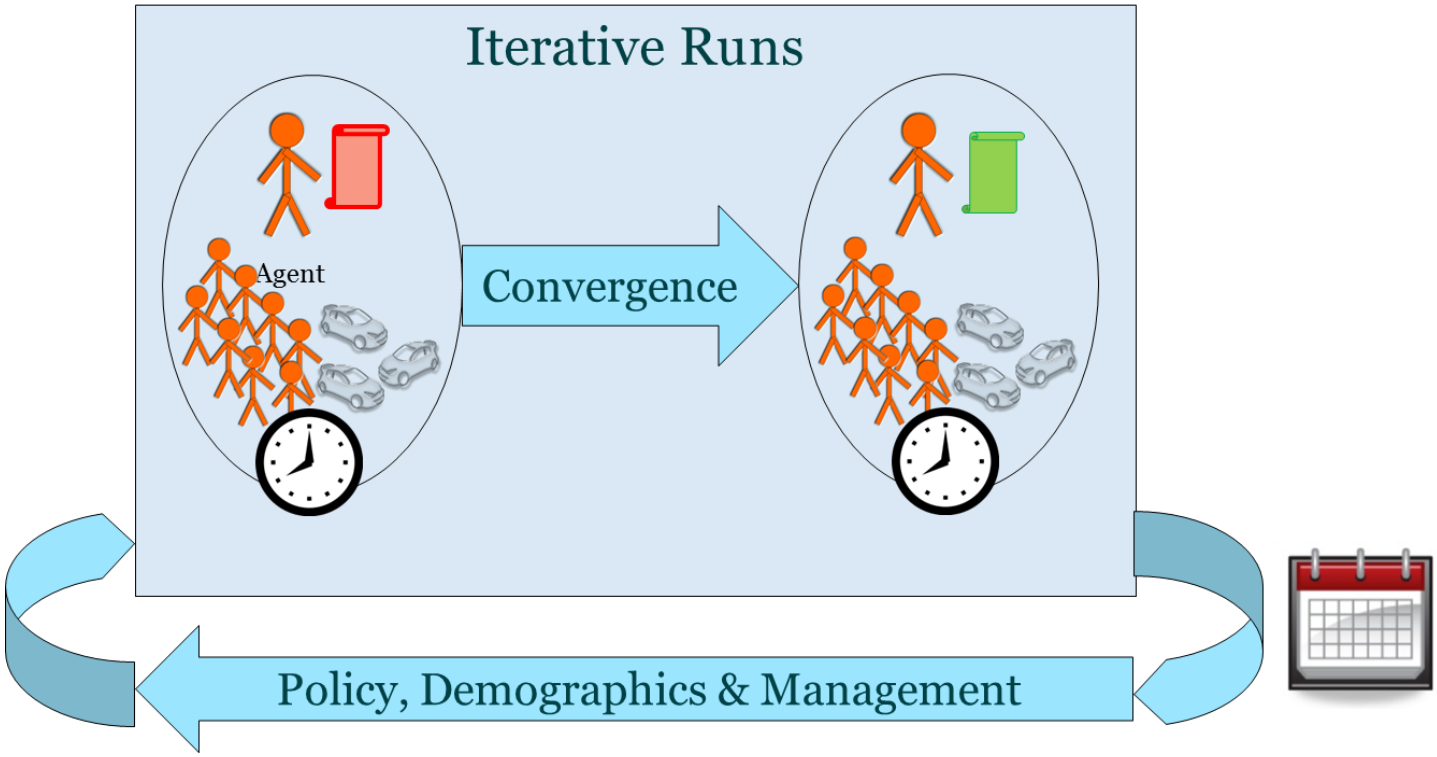


Figure 1 Generic Agent Based Model

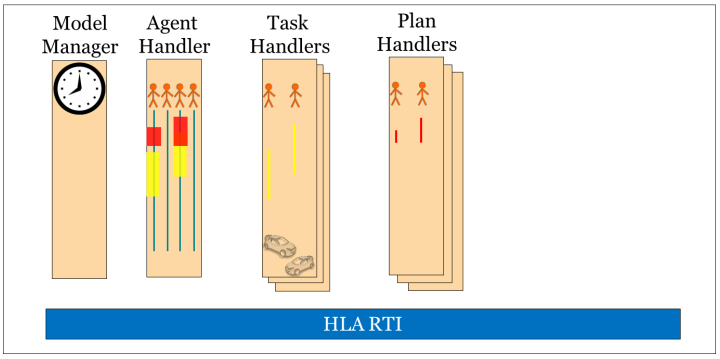
Although the model is agent-, rather than population-, based, it is still a traditional convergence-seeking transport model, where results are based on the longitudinal learning process of many interacting agents based on retrospective views of the average performance of the network in "normal" conditions. The improvement required for IM models is to progress from agents that rely on a historical view of past network performance to agents which use an intelligent view of current network conditions. This requires us to move away from a convergence model and be able to adjust an agent's plan through use of information about the current simulation by modelling the use of intelligent apps and network management.

IM Modelling Framework

The modelling framework selected by the Transport Systems Catapult uses an existing open standard, HLA (High Level Architecture - IEEE-1516e). HLA is based on the premise that no single monolithic simulation can satisfy the needs of all users and that it is not possible to anticipate the combinations of model components that users will find useful. HLA therefore seeks to establish a common development and execution architecture to facilitate the interoperability of all types of models and simulations including real-time, faster than real-time, event-driven simulations and management systems.

HLA provides a "Publish – Subscribe" data exchange between model components using a shared networked Run Time Interface (RTI). By placing the communications intelligence in the low level communications module rather than in each simulation component, the simulation components may publish all the data that may be required in any application,

HLA RTI: The base requirement is an HLA RTI. The RTI connects a component of the simulation, which publishes data about the agents and events it is managing, to the components that subscribe to that data. The RTI ensures that only the data that needs to be transmitted is actually forwarded.	
Simulation Prerequisites: The essential simulation components are a clock to manage simulation time in a single run and orchestration of multiple runs, and at least one handler to manage a population of agents and to initiate their activities. The HLA RTI provides a communication channel for time and events.	HLA RTI
Basic Agent Based Simulation: When an agent starts a task, its attributes for that task are assigned to a specific task handler (e.g. a traffic simulation).When the task finishes those attributes are passed back to the agent handler with the updated agent status (e.g. location). The HLA system supports multiple task handlers each of which updates the status of the network as the agents move in it.	Model Manager, Agent Handler, HLA RTI
An Agent Based IM Simulation: An agent may plan a task before it starts, or re-plan it as it happens. The planning activity is assigned to a handler which revises the plan based on current or predicted network activity, or on collaboration with other agents. Multiple plan handlers are possible, each with visibility of the status of the network and agents through the RTI.	Model Manager, Agent Handler, Task Handlers, HLA RTI



incurring a low overhead to do so. Only when another simulation component subscribes to it, is the data transferred which allows each component to be prolific in the data it publishes leading to more flexibility in how data is then used in the simulation. Table 1 shows how the HLA architecture is used to build up a simulation.

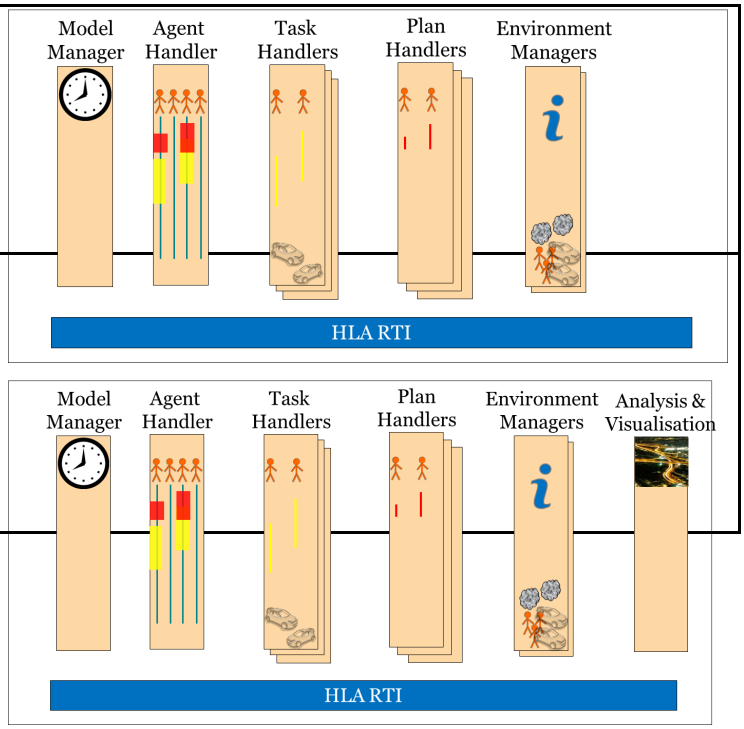
A Network IM Simulation: The environment managers also have visibility of the network status: e.g. congestion and emissions. They modify the day to day management of the network, or through repeated simulation the evolution of the demand and management policy of the network.	
Decision Support: Finally there are many means of displaying to decision makers how their actions affect the network performance. In a distributed simulation, an integrative visualisation and analysis component is required which may be presented as an immersive virtual display of the simulation or an analytical tool to compare options	

Table 1. Anatomy of an HLA IM model

Requirements Review

The Transport Systems Catapult's initial requirement for IM models was to use existing and proven standards – satisfied by using an existing IEEE standard and an open source HLA RTI bus to ensure that data could be exchanged between transport model components. Existing legacy transport model software may be extended using an API (Application Programming Interface) to provide the interface to the HLA RTI which then includes the existing software in the wider model providing synchronisation and date exchange services.

The next pair of requirements was for models to be flexibly configured and able to model innovative IM information and management systems, and policies. The HLA architecture, with its inherent distribution of tasks amongst model components and its data descriptions, satisfies both requirements in that a model component may interact with the rest of the model in new and as yet unforeseen ways, and can be as complex or as simple as the model application requires. Finally, the decision-support task requires that the analysis and visualisation tools are able to present a complete picture of the journeys being modelled. Using the proposed model architecture, these tools are able to subscribe to all of the information they need, across all aspects of the model, allowing accurate and up-to-date analysis for whatever task is required.

Contact

For more on the Transport Systems Catapult, check out the company website at www.ts.catapult.org.uk To find out more about the TSC's Intelligent Mobility modelling work, please email peter.sykes@ts.catapult.org.uk

2014 Product Updates

TransModeler
Traffic Simulation Software

TransModeler, developed by Caliper Corporation, is trip-based traffic microsimulation on a GIS platform. After launching the low-cost TransModeler SE in April 2014, Caliper started shipping the latest version of the flagship product, TransModeler 4.0, in October 2014.

This updated version incorporates recent traffic modeling and signal systems research into new features, such as microsimulation-based traffic signal optimization, and organizes traditional traffic analysis methods into a traffic impact analysis (TIA) toolbox. Other features have been improved, such as the dynamic traffic assignment (DTA) and managed lanes simulation methods. These improvements extend and enhance TransModeler as traffic microsimulation software for modeling wide-area networks and advanced traffic management strategies.

TransModeler now integrates signal optimization and TIA tools with a microscopic traffic simulation platform so as to enable users to complete basic traffic studies — for a single intersection, roundabout, interchange, or corridor — in a single piece of software.

Version 4.0 is faster than ever before, using new parallel computing methods in addition to multi-threading to reduce simulation running times. Route choice calculations are also given a performance boost, enabling faster dynamic traffic assignments for larger and larger networks. For example, the first ever MPO-wide microsimulation-based DTA model was built in TransModeler 4.0 for the six-county Jacksonville, FL MPO. This 4,000-square mile DTA model is being integrated with the MPO's activity-based model (ABM).

Managed lanes simulation techniques now support a wider variety of zone- and trip-based dynamic pricing strategies. Reversible managed lanes can also be built with the road editing and managed lane editing tools. TransModeler is being used successfully in designing and operating managed lanes and in investment grade revenue studies. As one example, TransModeler 4.0 is the modeling platform for the reversible I-95 Express Lanes in Northern Virginia set to open in December 2014.

Caliper

TransModeler 4.0 introduces:

- Microsimulation-based traffic signal optimization
- A complete Traffic Impact Analysis toolbox
- Dynamic skim matrices for ABM integration
- AutoCAD DWG and DXF file support
- HCM 2010 Interchange Ramp Terminal Level of Service reporting

And includes updated support for:

- Managed lanes simulation methods, including reversible managed lanes
- Existing HCM 2010 Level of Service reporting, especially Urban Streets
- Signal warrant evaluation
- Signal pre-emption plans
- Dynamic lane access control
- Vehicle emissions modeling
- Importing and georeferencing Synchro networks
- Automation of simulation runs and outputs
- Simulation of heavy-vehicle acceleration and deceleration on steep grades
- Simulation of passing lanes

TransCAD
Transportation Planning Software
Caliper
TransModeler
Traffic Simulation Software

2014 SimSub Activities

SimSub Midyear Meeting
Thursday, 3:15-4:45PM / Lexington, KY

John Halkias (FHWA) and Rick Dowling (Kittelson and Associates) moderate the mid-year meeting

- Introductions - John Halkias
- Task Group Reports
  - Research Needs and Resources Task Group - Mohammad Hadi
  - Calibration, Verification and Validation Task Group - Ray Benekohal
  - Liaison and Outreach Task Group – David Hale
  - Mesoscopic Task Group – Yi-Chang Chiu
  - Safety Simulation Task Group – William Young
  - Agent-Based Simulation Task Group – Monty Abbas
  - Mid-year Newsletter – David Hale
- Plans for the January Workshop
- FHWA Update (including Simulation Guide)
- Upcoming Conferences
- New Task Groups?
- Other Items
- Closing

Parallel Computing in Traffic Simulation and Assignment: Moving from Innovations to Practice

Sunday, January 11, 2015 9:00AM - 12:00PM
Convention Center, 156

Workshop: Data and Information Technology, Planning and Forecasting

Xuesong Zhou, Arizona State University, presiding
George F. List, North Carolina State University, presiding
Michalis Xyntarakis, Cambridge Systematics, Inc., presiding

Sponsored By:
Transportation Network Modeling (ADB30)
Traffic Flow Theory and Characteristics (AHB45)

The emerging multicore processor technique is offering unprecedented available parallel computing power to address the computational challenges in large-scale traffic assignment and simulation. This paradigm change in computing requires new algorithm design and better understandings on different modeling cases. Speakers from practitioners, researchers, and software vendors provide general audiences insights on the efficient use of parallel hardware and technologies.

Domain Decomposition, Parallel Computing and Traffic Assignment
ManWo Ng, Old Dominion University
Duc Thai Nguyen, Old Dominion University

The Benefits of Parallel Computing for Large Scale Network Equilibrium Models
Michael Florian, INRO Consultants Inc., Canada

Large-Scale Traffic Simulation: Using Parallel Computing on High-End Workstations
Kai Nagel, Technical University of Berlin, Germany

Parallel Processing and Agent-Based Representations of Traffic Signal Control
George F. List, North Carolina State University
Mehdi Mashayekhi, North Carolina State University

POLARIS: General Purpose Agent-based Modeling Framework Specialized for High-Performance Transportation Simulations
Joshua Auld, Argonne National Laboratory
Hubert Ley, Argonne National Laboratory
Vadim Sokolov, Argonne National Laboratory

Computational Advances in Traffic Assignment and Simulation: Algorithms in Practice
Qi Yang, Caliper Corporation
Ramachandran Balakrishna, Caliper Corporation

Panel Discussion: Moving Parallel Computing Technologies to Practice
Michalis Xyntarakis, Cambridge Systematics, Inc.
Xuesong Zhou, Arizona State University
George F. List, North Carolina State University
ManWo Ng, Old Dominion University
Michael Florian, INRO Consultants Inc., Canada
Kai Nagel, Technical University of Berlin, Germany
Qi Yang, Caliper Corporation
Hubert Ley, Argonne National Laboratory
Li Zhang, Connected Inc.

Using Simulation for Decision Support Systems: Past, Present, and Future

Sunday, January 11, 2015 1:30PM - 4:30PM
Convention Center, 102A

Workshop: Operations and Traffic Management, Planning and Forecasting

Montasir M. Abbas, Virginia Polytechnic Institute and State University, presiding

Sponsored By:
Transportation Network Modeling (ADB30)
Freeway Operations (AHB20)
Traffic Flow Theory and Characteristics (AHB45)

This workshop focuses on the use of simulation models in conjunction with decision support systems, in the past, presently, and in the future. An increasing need exists for traffic simulation to provide reliable system performance measures for use with proactive dynamic management systems. The active deployment of real-time decision support systems is emerging and spreading. This workshop will address topics related to the use of simulation in conjunction with such decision support systems.

1- Calibration of traffic simulation tools utilizing new data sources (e.g., connected vehicles)
2- Currently deployment of proactive dynamic management systems and available data
3- On-line and off-line learning aspects in transportation, and potential use of intelligent agents techniques
4- Simulation and macroscopic models: the unanswered questions
5- Emerging simulation challenges for decision support systems: information, control, and travelers "inertia"

Calibration of Traffic Simulation Tools Utilizing New Data Sources
Aleksandar Stevanovic, Florida Atlantic University

Deployment of Proactive Dynamic Management Systems and Available Data—Dallas ICM Implementation
Khaled F. Abdelghany, Southern Methodist University

Deployment of Proactive Dynamic Management Systems and Available Data—San Diego ICM Implementation
Matthew Juckes, TSS-Transport Simulation Systems
Jordi Casas, Transport Simulation Systems, Spain

The European Perspective: ATDM Deployments in the Netherlands
Serge Hoogendoorn, Delft University of Technology, Netherlands
Ramon Leonardus Landman, Delft University of Technology, Netherlands

On-line and Off-line Learning Aspects in Transportation, and Potential use of Intelligent Agents Techniques
Montasir M. Abbas, Virginia Polytechnic Institute and State University

Emerging Simulation Challenges for Decision Support Systems: Information, Control, and Travelers "Inertia"
Hani S. Mahmassani, Northwestern University

Car Following and Microscopic Simulation

Monday, January 12, 2015 1:30PM - 3:15PM *Convention Center, 101*

Lectern Session
Operations and Traffic Management

Soyoung Ahn, University of Wisconsin, Madison, presiding

Sponsored By:
Traffic Flow Theory and Characteristics (AHB45)

Calibration of Car-following Laws for Traffic Oscillation Prediction
Christine Rhoades, University of Illinois
Xin Wang, University of Illinois
Yanfeng Ouyang, University of Illinois

Vehicle Dynamics Model for Estimating Typical Vehicle Accelerations
Karim Fadhloun, Virginia Polytechnic Institute and State University
Hesham Rakha, Virginia Polytechnic Institute and State University
Amara Loulizi, Ecole Nationale d'Ingenieurs de Tunis, Tunisia
Abdessattar Abdelkefi, New Mexico State University

Fitting Time Headway-vehicle Speed Bivariate Distributions: An Operational Procedure For Two-lane Two-way Roads
Riccardo Rossi, University of Padova, Italy
Massimiliano Gastaldi, University of Padova, Italy
Federico Pascucci, Braunschweig University of Technology, Germany

Agent-Based Cooperative Traffic Modeling and Simulation
Maxime Guériau, IFSTTAR, France
Romain Billot, French Institute of Science and Technology
Julien Monteil, French Institute of Science and Technology
Nour-Eddin El Faouzi, French Institute of Science and Technology
Salima Hassas, Université de Lyon, France

Traffic Relaxation, Anticipation and Hysteresis
Hui Deng, University of California, Davis
H. Michael Zhang, University of California, Davis

Best Simulation Paper of 2013

Title:
From theory to practice: Gaussian process meta-models for the sensitivity analysis of traffic simulation models. A case study of the Aimsun mesoscopic model.

Authors:
Biagio Ciuffo, Jordi Casas, Marcello Montanino, Josep Perarnau, and Vincenzo Punzo

Award Ceremony Picture: Ed Lieberman (far left), Vincenzo Punzo (second left), Jordi Casas (second right), and George List (far right)

Best Paper Award

From theory to practice: Gaussian process metamodels for the sensitivity analysis of traffic simulation models. A case study of the Aimsun mesoscopic model.

Presented at TRB, Washington, January 2013

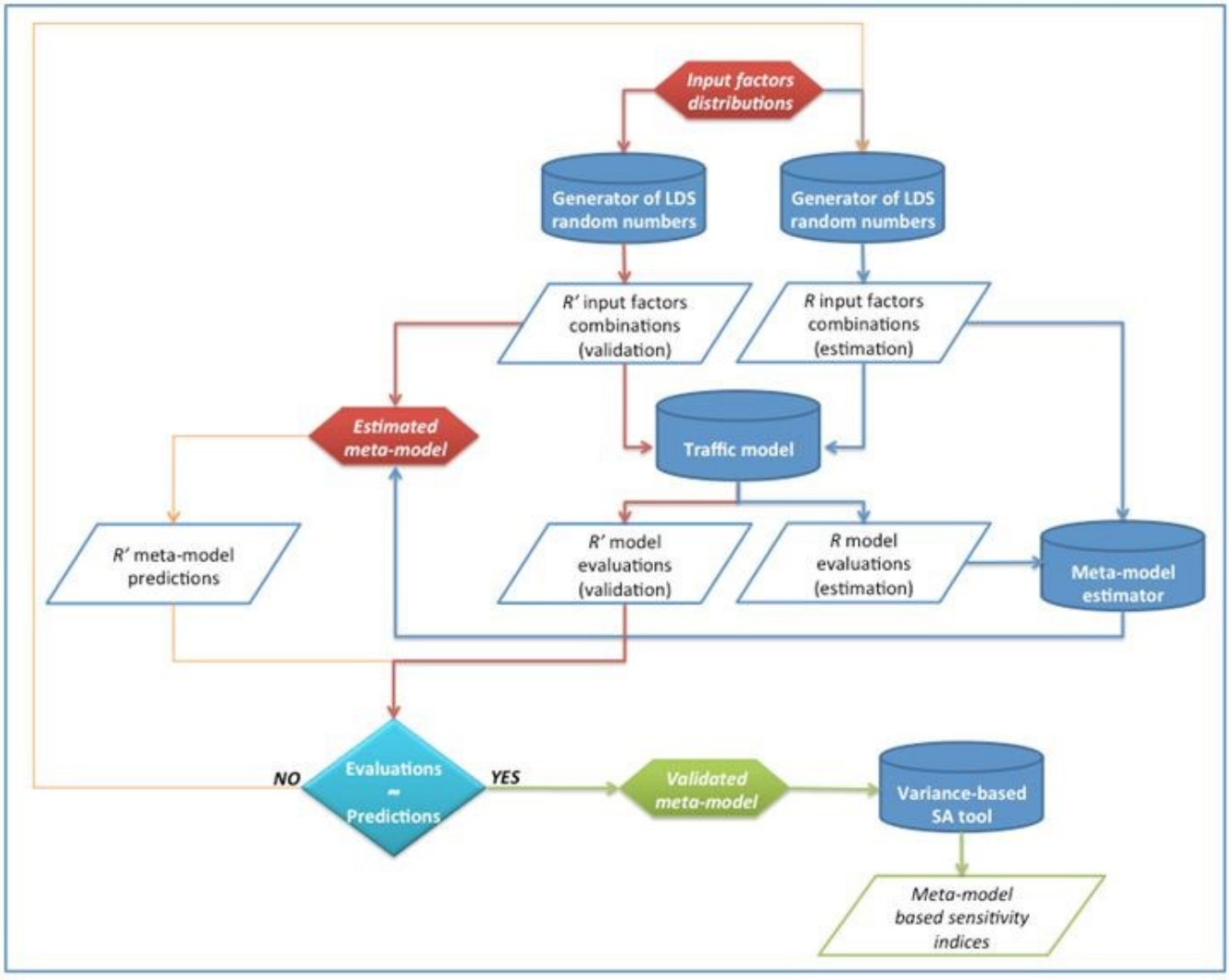
This paper discusses a metamodel-based technique for model sensitivity analysis and applies it to the Aimsun mesoscopic model.

The authors argue that the application of sensitivity analysis is crucial for the true comprehension and correct use of the traffic simulation model while also acknowledging that the main obstacle to an extensive use of the most sophisticated techniques is the high number of model runs that is generally required.

To read the full paper, please visit:
http://www.aimsun.com/wp/?p=3826

Authors:

- Biagio Ciuffo (Institute for the Environment and Sustainability European Commission – Joint Research Centre)
- Jordi Casas (TSS-Transport Simulation Systems and Universitat de Vic)
- Marcello Montanino (Department of Transportation Engineering, Università di Napoli "Federico II")
- Josep Perarnau (TSS-Transport Simulation Systems)
- Vincenzo Punzo (Institute for Energy and Transport European Commission – Joint Research Centre)



Joint Traffic Simulation Subcommittee

Draft Meeting Agenda
Transportation Research Board Annual Meeting
Monday, January 13, 2014, 7:30-9:30PM Marriott, Washington B1

A. Introductions - George List
B. Sponsoring Committee Chair Remarks - attending chairs or liaisons
C. Task Group Reports
    a. Annual Workshop Report (brief synopsis) – Rob Bertini
    b. Research Needs and Resources Task Group - Mohammad Hadi
    c. Calibration, Verification and Validation Task Group - Ray Benekohal
    d. Awards – Ed Lieberman
    e. Liaison and Outreach Task Group – David Hale
    f. Mesoscopic Task Group – Yi-Chang Chiu
    g. Safety Simulation Task Group – Bill Young
    h. Agent-Based Simulation Task Group – Monty Abbas
D. FHWA Update – James Colyar
E. New Business
    a. TRB Circular based on 2014 Workshop – Rob Bertini
    b. Joint ITE Webinars – Miranda Wells
    c. 2014 Midyear activities – George List
    d. 2015 Annual Workshop Planning – George List
F. Multitude Project Report - Vincenzo Punzo
G. Other Items (including new task groups and upcoming conferences)
H. Closing

Sponsor Committees

AHB45:	Traffic Flow Theory
AHB40:	Highway Capacity and Quality of Service
AHB20:	Freeway Operations
AHB25:	Traffic Signal Systems
ADB30:	Transportation Network Modeling
AHB55:	Work Zone Traffic Control
ADC20:	Transportation and Air Quality

2014 TRB Sunday Workshop on Simulation (SimSub): Looking Back and Looking Ahead

Program

Welcome from George List SimSub Chair 1:30

Moderator: Constantinos Antoniou

1) Femke van Wageningen-Kessels, Traffic Flow Modeling: A Genealogy 1:30-1:45

2) Ed Lieberman,History of the Use of Simulation in Traffic Analysis 1:45-2:00

3) Tom Rioux, Evolution of the TEXAS Model and Traffic Simulation 2:00-2:15

4) Peter Vortisch, History of VISSIM Development 2:15-2:30

5) Peter Wagner, Evolution of SUMO Simulation Model 2:30-2:45

Break 2:45-3:00

Moderator: Robert Bertini

6) Alex Skabardonis, Thoughts on Traffic Simulation Models 3:00-3:15

7) Vincenzo Punzo, Future Directions for Managing Uncertainty in Stochastic Traffic Models 3:15-3:30

8) Kaan Ozbay, Big Data and the Calibration and Validation of Traffic Simulation Models 3:30-3:45

9) William Young, Looking Back and Forward at Modeling the Safety System 3:45-4:00

10) Audience Input Panel: Nate Gartner, Hani Mahmassani, George List, Jeff Lindley 4:00-4:30