



Introducing TRB's Newly Established Joint Simulation Subcommittee: SimSub 2.0

Mr. Christopher Melson



Chris Melson
Louisiana State University



John Shawn
Iowa State University



Chris Melson and John Shawn have been the new chairs of the TRB Joint Simulation Subcommittee (**SimSub**) since Jan 2021

In August 2020, the Transportation Research Board (TRB) established the Standing Committee on Traffic Simulation^[1] – and its subcommittees: the Joint Simulation Subcommittee (SimSub) and Research Subcommittee. This article will introduce readers to the newly established SimSub (for distinction termed **SimSub 2.0**) by:

- 1) Summarizing the history of SimSub;
- 2) Defining **SimSub 2.0**'s purpose, goals, and structure; and
- 3) Providing ways traffic simulation users can be involved in their activities

Brief History of SimSub

SimSub was formally established as a joint TRB subcommittee in 2005 – and was chaired by Dr. Ken Courage (University of Florida) from its inception to 2010. SimSub's activities included conducting an annual workshop, subcommittee meeting, newsletter, awards program (primarily lifetime achievement and best paper awards), evolving technical task groups. Dr. George List (NC State) served as chair from 2010 – 2018 and Dr. Mohammed Hadi (Florida International University) from 2018 – 2020. The contributions to the traffic simulation field by SimSub, through its leadership and supporters, cannot be overstated; and certainly was not properly summarized above. Dr. List presented a more detailed history of SimSub at the 2021 SimSub Annual Meeting^[2].

The outreach, education, and research activities of SimSub have effectively been divided among the Committee on Traffic Simulation and its two subcommittees. Therefore, **SimSub 2.0** has a more refined focus.

Overview of SimSub 2.0^[3]

The overarching purpose of **SimSub 2.0** is to:

Through a series of meetings earlier this year, **SimSub 2.0** adopted the following as their main goals (all related to traffic simulation and its users):

ID	GOAL	Assigned Task Group
G1	Develop, maintain, or otherwise leverage existing, mechanism(s) to collect user needs and related input	User Needs Task Group
G2	Recommend actions and venue to address user needs	
G3	Develop, maintain, host, or otherwise contribute to existing, "living" library of reference material	Resources Task Group
G4	Provide forum for information exchange and foster joint efforts	Liaison/Outreach Task Group
G5	Maintain comprehensive liaison structure	

In June 2021, **SimSub 2.0** established three Task Groups (see above) to accomplish these goals.

SimSub 2.0 also maintains a comprehensive liaison structure that includes:

- 1) Industry groups (relevant agencies and professional organizations)
- 2) User-related groups (representatives of broad user groups, including administrators, data providers, modelers, and vendors)
- 3) Research groups (14 liaison TRB committees)

Ways to Be Involved!

SimSub 2.0 has ample volunteer opportunities – for both researchers and practitioners. Currently, this is primarily through Task Group activities^[4]. However, **SimSub 2.0** and the Committee on Traffic Simulation are always interested in partnering with individuals/groups on joint initiatives. Please feel free to contact **SimSub 2.0**'s Co-Chairs (Chris Melson at cmelson1@lsu.edu or John Shaw at jwshaw@iastate.edu) if interested in learning more or being involved. You may also signup to their e-mail listserv^[5]. Lastly, all are welcomed to attend their quarterly meetings. A follow-up newsletter article is anticipated for the Fall – describing the current activities of **SimSub 2.0** and the Committee on Traffic Simulation in more detail.

^[1] Find more information on the Standing Committee on Traffic Simulation on their website: <http://trbsimsub.uta.edu/>.

^[2] Access Dr. List's presentation slides at: <https://bit.ly/3lZSMxD>.

^[3] The purpose and goals of **SimSub 2.0** and its liaison structure are discussed in more detail in the 2021 SimSub Annual Meeting notes: <https://bit.ly/3g3balr>.

^[4] More information on activities perused by each Task Group is summarized in SimSub's latest meeting notes: <https://bit.ly/3sf9rhH>.

^[5] At: <https://bit.ly/2VTefgR>.

TIPS & HINTS

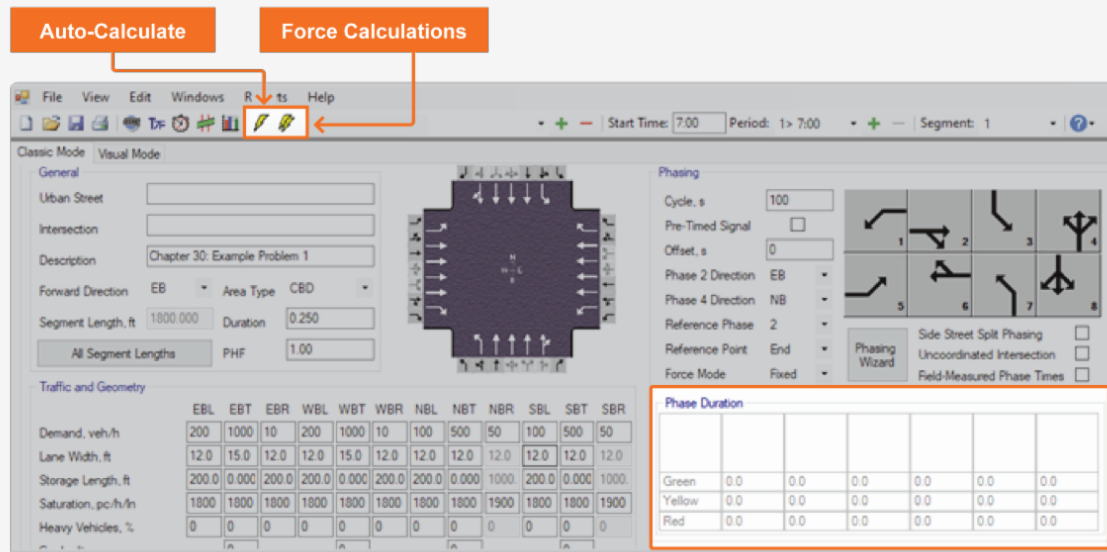
Calculation Mode

The Streets module in HCS provides the user with two calculation modes.

The Auto-Calculate option is set as the default option for Streets and recommended for most projects, updating all calculations automatically whenever any input is changed.

When the Auto-Calculate option is off, all model outputs, including Control Delay, Level of Service (LOS), and the final phasing/timing diagrams, are frozen and grayed out until the user pushes the button "Force Calculations," as shown below. This option gives the user a higher degree of control when input changes

are applied to the model, which can speed up the inputting process for larger projects and help track adjustments to the project's operational performance.



Automatic Adjustment of Segment Type in Freeways

Dr. Gustavo de Andrade



In LOS analysis practice, the terms on-ramps and merges are often used interchangeably, as are off-ramps and diverges, while in the HCM ramp analysis is normally associated with Freeway Merge and Diverge segments (Chapter 14), one case covered by the HCM6 (p. 14-30) deals with lane additions or drops for merges and diverges, respectively. In these cases, the Merge segment should be treated as a Basic Freeway segment with the appropriate number of lanes. The HCS Freeway Facilities module automatically identifies such situations, facilitating the user to model the facility while ensuring HCM compliant analysis.

Merge

Analyzed Type

Basic

Segment

None

Flow

Speed

Density

TTI

LOS

Type

Length, ft

Segment ID

Lanes

Basic	Merge	Basic	Diverge	Basic
5280	1500	2280	1500	5280
1	2	3	4	5
2	3	3	3	3

▶

⏸

1

2

3

4

5

Merges with two-lane ramps are not subject to the same rule per the HCM (pages 14-30 to 31). The two-lane entrance is characterized by two separate acceleration lanes, each successively forcing merging maneuvers to the left, thus forcing the merge chapter to be used.

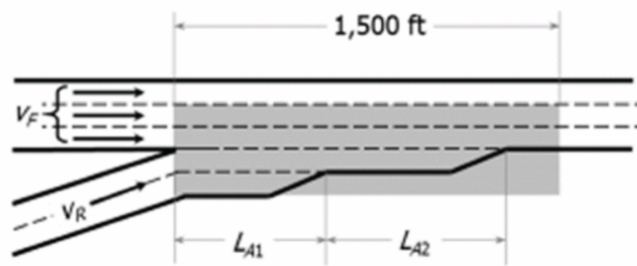


Exhibit 14-16, HCM page 14-30: Typical Geometry of a Two-Lane Ramp-Freeway Junction

Weaving

HCS uses a similar feature for weaving segments. The HCM Weaving Segment analysis (Chapter 13) defines the maximum weaving length (L_{MAX}) as the “length at which weaving turbulence no longer has an impact on operations within the segment.” L_{MAX} is a function of the weaving demand lane configuration. When the calculated L_{MAX} is shorter than the distance between the endpoints of barriers or solid markings adjacent to entry and exit points (Short Length L_S shown in the figure), HCS automatically analyzes the segment as a basic freeway segment. In such cases, the user may consider revising the segmentation used and analyze the merge and diverge segments separately.

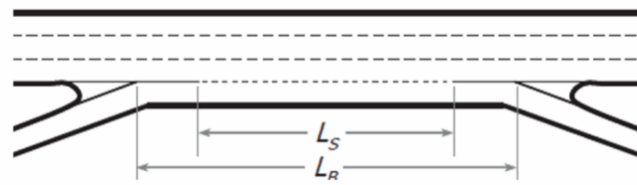


Exhibit 14-16, HCM page 14-30: Measuring Length of a Weaving Segment

Weaving

Analyzed Type

Basic

Type	Basic	Merge	Basic	Diverge	Basic	Weaving	Basic
Length, ft	5280	1500	2280	1500	5280	5000	5280
Segment ID	1	2	3	4	5	6	7
Lanes	2	3	3	3	3	4	3

Updates on the upcoming HCM 6.1 from the TRB Highway Capacity and Quality of Service Committee meeting this summer



F Thomas Creasey, PhD

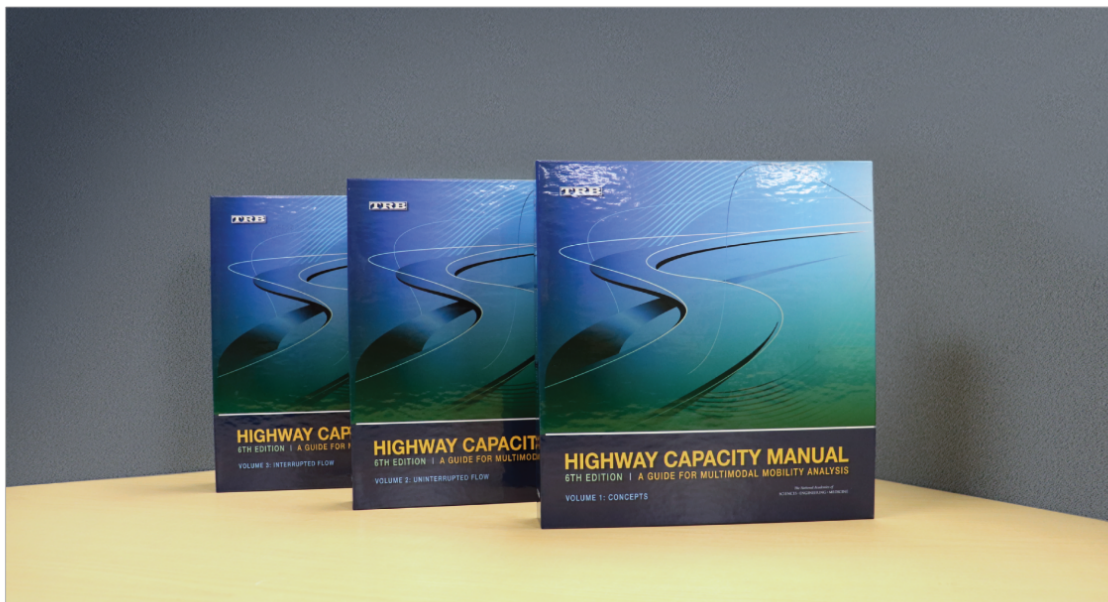
ACP40 Chair and

Vice President of Transportation Engineering at Caliper Corporation

The TRB Highway Capacity and Quality of Service Committee (ACP40) held mid-year meetings from August 24th to 26th. The virtual meeting included workshops on current research related to the Highway Capacity Manual, meetings of the five individual subcommittees, and the full committee meeting.

A focal point of the committee in 2021 has been the completion of new and revised materials to be included in the upcoming HCM 6.1, which will be released later this year. During the mid-year meeting, the committee was able to vote on the final items that will be included in the update. The new version of the Manual will be published in both paper, and digital (ePub and PDF) formats and will include new and revised pedestrian methods, a new network analysis method that evaluates a freeway and arterial together, and new research from a 10-state pooled fund study that provides capacity adjustment factors for Connected and Automated Vehicles (CAVs). "The HCM 6.1 will be the first nationally recognized reference document to provide transportation agencies with tools that will help them plan and program infrastructure investments that include CAVs.", Said Tom Creasey, Committee Chairman.

The committee also took the first steps to reconsider the complexity of the signalized intersection method and what should be done with the Planning and Preliminary Engineering Applications Guide (PPEAG) to the HCM. With the release of HCM 6.1 just months away, these issues will be at the forefront of future committee discussions.



STAFF SPOTLIGHT

Fabio Sasahara

Outreach and Training Team Lead



My history with McTrans Center started a few years before my formal hire. I have spent several years as a University of Florida graduate student working on a research project to develop new Highway Capacity Manual methods, allowing me to work closely with the McTrans team.

Therefore, when I officially joined the McTrans team after graduation, I felt at home right on my first day. It is a pleasure to work with a diverse team that includes engineers, software developers, designers, and administrative staff, who teach me much every day.

One of my favorite facts about McTrans is being part of a university while many of our clients are private consultants and public agency members. In this mix, we are able to connect both worlds: the state-of-art research on the academic side and the state-of-practice by listening to our clients' needs. Through my role in training and outreach, I really enjoy the challenge of translating complex engineering concepts into practical solutions to make our users' work better and more efficient.



Upcoming Training Webinars

Highway Safety Analysis Webinars

8 PDHs are provided for each series

Oct 26 - 27 1 - 5 PM ET

Highway Capacity Analysis Webinars

18 PDHs are provided for each series.

Nov 01 - 05 1 - 5 PM ET

HCS Hands-On Training

8 PDHs are provided for each series

Nov 09 - 10 1 - 5 PM ET

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