

Sponsoring Committees:
AHB45: Traffic Flow Theory
AHB40: Highway Capacity and Quality of Service
AHB20: Freeway Operations
AHB25: Traffic Signal Systems



January 2010: Contents

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Newsletter

January 2010

Please visit our web site at:

<http://www.tft.pdx.edu/simsub.htm>

A happy and prosperous new year to all!

It is a great privilege to take on the duty of being the chair of the subcommittee. I feel confident that this TRB meeting will prove to have activities of interest to all of you.

The Annual Workshop Task Group has put together another excellent program for the Sunday Workshop. This year's Simulation Workshop (Sunday, January 10, 1:30 – 5:00 pm) will focus on modeling for congestion pricing and HOV to HOT conversions. The speakers will tell us about studies being performed across the country using various analytical methods. They will describe the benefits, pitfalls, capabilities, limitations, concerns, and issues identified. This topic should draw a big crowd. You should attend if your schedule permits.

We should have a discussion that focuses on future plans for the subcommittee, following-on to last year's meeting. Please come prepared to share your thoughts. I have left some time at the end of the agenda for this.

Thanks,
George List

TRB 2010 SimSub Meeting Agenda

Monday, 7:30-9:30PM Marriott, Wilson B & C

- Introductions
- Sponsoring Committee Chair Remarks
- Annual Workshop (Brief synopsis and discussion of future topics)
- Research Needs and Resources
- Calibration, Verification and Validation
- Liaison and Outreach
- Awards
- FHWA Update
- Simulation in the HCM 2010
- 2010 midyear activities
- Future subcommittee activities
- Other items
- Closing

Task Group Reports

Here are the reports submitted by each of the task groups.

Annual Workshop Task Group

Submitted by John Halkias and James Colyar, FHWA

This task group is responsible for the organization and presentation of an annual workshop on traffic simulation. This year it will be held on Sunday afternoon in the Palladian Room of the Shoreham, 1:30PM- 4:30PM.

One big concern in modeling congestion pricing is how is travel choices treated in the models that we use to evaluate congestion pricing and HOT lanes (as well as conversion from HOV to HOT)? This includes mode choice, time of departure, destination and route choice. A lot of folks use simulation to determine the impacts (often times at the micro scale) of these strategies on facilities as well as system-wide. This is OK once the decision is made to either deploy congestion pricing strategies or convert the HOV lanes to HOT lanes. However, in making the case (or to actually make the decision) these analytical tools fall short of modeling the choices that the traveler makes. Very little is understood as to how these choices are made and the real impacts of these strategies on travel demand as well as traffic operations. Currently, there are numerous studies being conducted to evaluate the practical congestion/HOT lane systems. Simulation-based evaluations of congestion/HOT lane operations have been conducted to quantify the performance of a proposed congestion/HOT lane system and to identify potential problems before they are implemented. Simulation results provide quantitative assessments on the likely performance of congestion/HOT lane projects and help identify the potential operational challenges when they open. However, some of these simulation packages cannot sufficiently handle the congestion/HOT lane operation issues explicitly (using their built-in modules). A lot of these are static pricing and toll rates but cannot dynamically change to reflect changing conditions (such as congestion levels) under flexible strategies that are required for congestion pricing and HOT lane operations. In the Freeway Simulation Subcommittee meeting at the 2007 TRB annual meeting, a module for HOT lane operations was introduced by PTV but it's not currently available.

A study being conducted by FHWA is looking at nine HOV to HOT lane conversions around the country and are examining a variety of issues relating to their usage:

- HOT lane characteristics (such as travel time savings, travel time reliability and geometric design),
- traveler characteristics (such as income, gender, age), and
- alternative characteristics (such as available transit, parallel facilities)

Knowing this will provide much needed information on the impacts of HOV to HOT conversions. One major preliminary finding is that the vast majority of LOV paying customers of HOT lanes were formerly SOVs on the GPLs.

This year's Simulation Workshop theme is modeling for congestion pricing/HOV to HOT conversions. The Workshop will consist of studies as well as cases being performed around the country using various levels of analytical methods and what their benefits, pitfalls, capabilities, limitations, concerns, issues, etc. The following is a list of presenters with titles of their presentations:

"Use of Simulation Models in Traffic and Revenue Forecasting for Managed Lanes", by Cissy Szeto Kulakowski, Wilbur Smith Associates

"Simulation on Customized Dynamic Tolling Strategies for HOT Lane Operations", by Dr. Yinhai Wang, University of Washington

"Tools for HOV to HOT Benefits Analysis" by Dr. Mark Burris, Texas A & M University

"Quantifying Congestion pricing Benefits Using Simulation", by Patricia Hu, Oak Ridge National Laboratory

"Congestion-Responsive Pricing for US-36 Corridor in Denver", by Dr. Yi-Chang Chiu, University of Arizona

"Modeling Congestion Pricing in a Test Corridor for the ICM Initiative", by Vassili Alexiadis, Cambridge Systematics

"Modeling I-270 Managed Lanes in Maryland Using Microsimulation", by Dr. Elise Miller-Hooks, University of Maryland

Research Needs and Resources Task Group

Submitted by Mohammed Hadi

A subgroup was formed consisting of five volunteers who are members of the Research Needs and Resource Task Group to produce a white paper on the modeling of pollutant emission in microscopic simulation models. The issue of emission modeling in simulation models has been identified as an important issue by Traffic Flow Theory committee and Simsub surveys. As part of this effort, the subgroup performed a survey of the developers of leading microscopic simulation tools to identify the methods used by these tools to assess the emission resulting from transportation system operations. The results from this survey and additional background, supporting material, and recommendations for future research are being summarized for inclusion in the white paper.

Calibration, Verification, and Validation Task Group

Submitted by Ray Benekohal

In Spring of 2009, the CVV Task Group submitted a problem statement to be considered for funding of an NCHRP Synthesis study. The proposed study was not selected for funding. Currently, the task group is contemplating writing a problem statement for an NCHRP study.

Liaison and Outreach Task Group

Submitted by Ken Courage

The Network Modeling Committee (ADB30) approved becoming a SimSub sponsoring committee. Henry Liu will be the liaison between ADB30 and SimSub.

Sponsoring Committee Reports

Here are the reports submitted by representatives from the supporting committees.

AHB 45 Traffic Flow Theory Committee

The Traffic Flow Theory Committee has its meeting Tuesday, January 12 from 3:45 – 5:30 PM in Room B5 of the Marriott. The committee is also sponsoring sessions 409, 452, 560, 627, 628, and 676. Many of these are likely to be of interest from a simulation standpoint.

AHB 20 Freeway Operations Committee

Submitted by Panos Prevedouras

The Freeway Operations Committee has its meeting Tuesday, January 12 from 3:45 – 5:30 PM and then 7:30 - 9:30 PM in Wilson B&C of the Marriott. The committee also has subcommittee meetings on Sunday and Monday. It is sponsoring sessions 130, 202, 258, 320, and 324.

The subcommittee on freeway operations simulation - AHB20(2) - did not hold a mid-year meeting. However, during the Annual Meeting, it will be hosting a number of presentations on Sunday January 10, 5:00 – 6:00 PM in the Tyler Room, Marriot, that focus on the state-of-the-art in freeway corridor simulation.

(1) Sustainable Macro-Micro Simulation Models – The Portland Regional Freeway Experience, Thomas Bauer, PE, PTOE, President, PTV America

(2) Multi-Resolution Modeling Methods for Analyzing User Class Restrictions on Freeway Corridors, Jeff Shelton, Assistant Research Scientist Texas Transportation Institute

(3) Freeway Corridor Simulation Model Calibration using Latin Hypercube Sampling Design, Byungkyu (Brian) Park Assistant Professor, CEE Department, University of Virginia

(4) Challenges, Successes and Opportunities in a Simulation Framework for the Greater Toronto Area, Goran Nikolic, MTO, Canada

(5) Analysis of Inside Managed Truck Lanes on Freeways in Urban Areas, Chris Cherry, Assistant Professor, CEE Department, University of Tennessee-Knoxville

AHB 25 Traffic Signal Systems Committee

The Traffic Signal Systems Committee has its meeting Tuesday, January 12 from 1:30 – 3:15 PM in Wilson B&C, Marriot and then 7:30 – 9:30 PM in Room B5, Marriott. The committee is also sponsoring sessions 130, 134, 430, 629, 675, and 694. The newly-formed Simulation of Traffic Signal Systems Subcommittee, AHB25(3) is meeting Sunday January 11, 8:00 – 9:00 AM in Balcony D, Marriott.

AHB 40 Highway Capacity and Quality of Service

Submitted by Loren Bloomberg

The Highway Capacity and Quality of Service Committee has its meeting Sunday, January 10 from 7:30 – 9:30 PM and Monday, January 11 from 8:00AM – Noon in Wilson B&C of the Marriott. It also has subcommittee meetings scheduled across Saturday and Sunday. The committee is sponsoring sessions 302, 380, and 563. Several of the presentations focus on simulation. The committee is also in the process of finalizing the HCM 2010, which has chapters focused on simulation and alternative analysis tools.

The 2009 Midyear Meeting of the Committee on Highway Capacity and Quality of Service (AHB 40) was held from June 10-13, 2009 in Newport Beach, CA. The focus of the meeting was on developing, reviewing, and approving draft chapters for the upcoming 2010 *Highway Capacity Manual*. In addition to regular subcommittee and full committee meeting, AHB40 held a joint lunch meeting with the local Institute of Transportation Engineers (ITE) sections on “Technical Updates on the 2010 Highway Capacity Manual.” Presentations included new methodologies for signalized intersections, the updated freeway facilities methodology, interactive elements of Volume IV, and an open discussion with the group.

The Traffic Simulation Applications (TSA) subcommittee conducted its meeting on Thursday, June 11. Approximately 30 members and friends participated. The focus was on continuing preparation for two key simulation-related chapters in the 2010 HCM:

Chapter 6 (now called *HCM and Alternative Analysis Tools*) begins with a discussion of HCM-based tools, and addresses service volume tables, default values, and operations analysis. The bulk of the chapter, however, is focused on alternative tools, with topics covering concepts and terminology, differences between the HCM and alternative tools, a framework for applying alternative tools, performance measures, selecting alternative tools, and application guidelines.

Chapter 7 (now called *Interpreting HCM and Alternative Tool Results*) includes topics on uncertainty and variability, defining and computing performance measures, and presentation of results. A companion Chapter 24 provides supplemental technical material on vehicle trajectory analysis, which is introduced in Chapter 7.

TSA subcommittee members have been involved in reviewing and updating material for these two chapters. In addition, a task force (led by Erik Ruehr) was created to address and resolve issues for the complex material in Chapter 7. Since the HCQS midyear meeting, that task force has successfully completed its activities. Task force members included Rick Dowling, John El Khoury, Mohammed Hadi, Jan-Mou Li, Yongchang Ma, Ertan Ornek, Michael O'Rourke, David Petrucci, Bastian Schroeder, Bhuvanesh Singh, David Stanek, Pete Sykes, Pete Terry, Roland Trapp, Grant Zammit, and Lin Zhang. Ken Courage and Paul Ryus were the principal authors of the chapter.

A Preview of the 2010 HCM Alternative Tool Guidance (ATG)

Ken Courage, University of Florida

One of the new 2010 HCM features of interest to the traffic simulation community is the guidance for the use of alternative tools to supplement the analysis procedures that are prescribed in various chapters. This guidance was developed in response to a HCQS Committee resolution that *The Highway Capacity Manual should include guidance to developers of traffic simulation models and other traffic analysis tools to promote consistent and accurate reporting of measures of effectiveness for highway capacity analysis.* This discussion summarizes the essential features of the 2010 HCM ATG.

ATG Structure

The ATG appears throughout each of the four HCM volumes. Volume 1 contains two chapters with significant ATG content. Chapter 6 (Analysis Tools) contains three ATG sections: Traffic Modeling Concepts, Selection Criteria, and Application Framework and Guidelines. Chapter 7 (Interpreting and Presenting Results) also contains three ATG sections: Performance Measures, Vehicle Trajectory Analysis, and Stochastic Aspects .

A couple of concepts that require more elaboration were introduced in Volume 1: The first is the set of conditions under which alternative tools might supplement or replace the HCM procedures (See Exhibit 1). Note the terminology *should be considered*. This terminology was arrived at as a compromise the positions proposed by various stakeholders

The second concept is the hierarchy of modeling terms. The definition of what constitutes a “model” for traffic analysis has been somewhat obscure throughout the literature and especially in past HCM editions. Exhibit 2 presents five terms that have been referred to as simply *models* and places them into a hierarchal structure. How well this terminology will be embraced by the simulation community is unknown. The main purpose of the definitions presented in Exhibit 2 was to promote internal consistency within the HCM itself.

Volumes 2 and 3 contain the HCM procedures for analyzing uninterrupted and interrupted flow facilities, respectively. The ATG content of each procedural chapter is structured according to the following topics:

- Strengths and Limitations of the HCM Procedure
- Additional Features from Alternative Tools
- HCM-Compatible Performance Measures
- Conceptual Differences that Preclude Comparison
- Parameter Adjustments to promote comparability
- Step by Step Instructions for Alternative Tools

Exhibit 1: Alternative tools *should be considered* when:

- The configuration of the facility has elements that are beyond the scope of the HCM.
- Viable alternatives being considered in the study require the application of an alternative tool to make a more-informed decision.
- The measures produced by alternative tools are arguably more credible than the HCM measures.
- The measures are produced as a byproduct of another task, such as network-traffic-control system optimization.
- The decision process requires additional performance measures which are beyond the scope of the HCM.
- The system under study involves a group of different facilities and/or travel modes with mutual interactions invoking several procedural chapters of the HCM.
- Routing is an essential part of the problem being addressed.
- The quantity of input and/or output data required presents an intractable problem for the HCM procedures.
- The HCM procedures predict oversaturated conditions that last throughout a substantial part of a peak period and/or queues that overflow the available storage space.

Exhibit 2: Hierarchy of Modeling Terms

- *Algorithm*: “a set of rules for solving a problem in a finite number of steps.”
- *Model*: “a procedure that uses one or more algorithms to produce a set of numerical outputs describing the operation of a highway segment or system, given a set of numerical inputs.
- *Computational Engine*: the software implementation of one or more models that produces specific outputs given a set of input data.
- *Traffic Analysis Tool*, “a software product that includes, at a minimum, a computational engine and a user interface.
- *Model Application*, the physical configuration and operational conditions to which a traffic analysis tool is applied.

- **Sample Calculations:** In each chapter one of the sample calculations was extended beyond the scope of the HCM procedures to demonstrate how alternative tools (mostly simulation tools) could be used to overcome HCM limitations. No numerical comparisons were made between the HCM and simulation results.

Volumes 1, 2 and 3 will be delivered in hard copy format and were therefore subject to page limitations. Volume 4 is a virtual volume that will be available online. No page limitations will apply to Volume 4. The supplemental material for each of the procedural chapters in Volumes 2 and 3 will be assigned to a chapter in Volume 4. The ATG content of Volume 4 consists mainly of supplemental examples that illustrate the use of alternative tools to deal with specific situations that are beyond the scope of the HCM procedures.

Analysis of Vehicle Trajectories

Another Committee resolution required that analysis of individual trajectories produced by simulation tools should be used to *promote consistent and accurate reporting of measures of effectiveness*. Trajectory analysis has been proposed in the literature as “the lowest common denominator” for comparing performance measures from different tools.

Chapter 7 presents general guidelines for defining and comparing measures from different traffic analysis tools. It introduces the concept of vehicle trajectory analysis and presents some basic requirements for the development of analysis techniques. Chapter 24 in Volume 4 presents more detail on the development of algorithms that can be incorporated into all simulation models to produce more comparable results.

The Chapter 24 material begins by establishing the guidelines for development of set of procedures that can be incorporated in a practical manner into simulation models that deal with traffic flow. These guidelines are summarized in Exhibit 3.

The “Vehicle Trajectory Analysis for Performance Evaluation” (VTAPE), utility software was developed by NCHRP Project 3-85 to investigate and demonstrate the trajectory analysis process. VTAPE provides very detailed step-by-step analyses with intermediate values reported for all parameters at each time step. It is a useful tool for understanding and enhancing the trajectory analysis methodology. However, it is also intended as a research tool and should not be viewed as an end-user analysis tool. Its ultimate purpose will be to serve as the computational engine for the continuing analysis and development of vehicle trajectory procedures. It was developed with that purpose in mind.

Several examples of trajectory analysis are presented in Chapter 24. The first example, as shown in Exhibit 4, was developed with all randomness removed from the operation. This is the classic form that appears often in the literature to support discussion related to queue accumulation and discharge. A copy of the exhibit used in Chapter 31 to illustrate the basic traffic signal principles is also shown in Exhibit 5. The difference between the two figures is that one was produced directly from the vehicle trajectory data and the other was drawn by hand.

Exhibit 3: Trajectory Analysis Development Guidelines

- The trajectory analysis procedures are limited to the analysis of trajectories produced by the traffic flow model of each simulation tool. The nature of the procedures does not suggest the need for developers to change their driver behavior or traffic flow modeling logic.
- The algorithms must be suitable for computation “on the fly.” They must not require information from a future time step that would complicate the data handling within the simulation process.
- Computationally complex and time consuming methods should be avoided to minimize the additional load on the model. Methods should be developed to simplify situations with many special cases because of the difficulty of enumerating all special cases.
- If the procedures for estimating a particular measure cannot be satisfactorily defined to permit a valid comparison between the HCM and other modeling approaches, then such comparisons should not be made.
- All performance measures that accrue over time and space shall be assigned to the link and time interval in which they occur. There are subtle complexities that make it impractical to do otherwise.
- Arbitrary thresholds should be kept to a minimum because of the difficulty of obtaining acceptance throughout the user community for specific thresholds. Where arbitrary thresholds cannot be avoided, they should be justified to the extent possible by definitions in the literature and, above all, they should be applied consistently for different types of analysis.

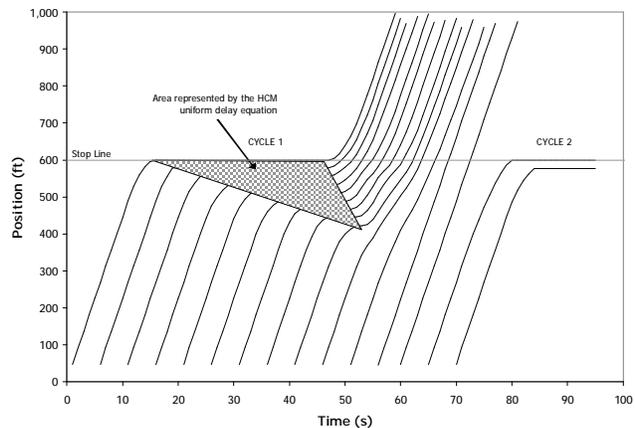


Exhibit 4. Trajectory Plots for Uniform Arrivals and Departures

The ability to reproduce the classic representation from controlled conditions will provide a measure of confidence in the validity of other examples involving much more complicated situations.

Several examples illustrating the use of vehicle trajectories for situations that are not covered explicitly by the HCM procedures are also presented in Chapter 24:

- Cycle failure in a generally undersaturated operation
- Queue backup into an upstream link for a portion of a cycle
- Heavily oversaturated operation that fills the entire link
- Complex multi phase operation
- Single and multilane freeway trajectories
- Ramp merging and diverging
- Queue length fluctuation, as shown in Exhibit 6.

Summary of Trajectory Analysis Procedures

The Exhibit 3 guidelines for trajectory analysis procedures indicated that arbitrary thresholds should be kept to a minimum. There are, however, some thresholds that must be adopted. The following thresholds have been incorporated.

Vehicle length: For most purposes, the actual vehicle length assigned by a simulation tool should be used. However, the HCM defines the *queued state* as one in which a vehicle is stopping and is within one car length of its leader. Following distance of 20 ft will be used for this purpose.

Stopped State: Several arbitrary thresholds have been applied for this purpose. To maintain consistency with the definition of the stopped state applied in other chapters of the HCM, a speed of 5 mi/h will be used here for determining when a vehicle has stopped.

Other states in addition to the stopped state that must be defined consistently for vehicle trajectory analysis include: The uncongested state, in which a vehicle is moving in a traffic stream that is operating below its capacity; the congested state, in which the traffic stream has reached a point that is at, or slightly above its capacity but no queuing from downstream bottlenecks is present; and the severely constrained state, in which downstream bottlenecks have affected the operation.

These states apply primarily to uninterrupted flow. A precise definition would require very complex modeling algorithms involving capacity computations or “look ahead” features, both of which would create a computational burden. Therefore, an easily applied approximation must be sought. Threshold speeds are a good candidate for such an approximation.

It is convenient to think of these states in terms of speed ranges. To avoid specifying arbitrary speeds as absolute values, it is preferable to use the target speed of each vehicle as a reference. The target speed is the speed at which the driver would prefer to travel. In the absence of accepted criteria, three equal speed ranges will be applied for purposes of this section.

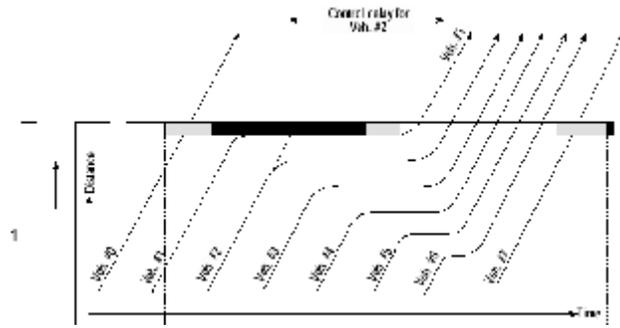


Exhibit 5. Basis of the Chapter 31 Uniform Delay Equation

Thus, the operation will be defined as uncongested if the speed is above two-thirds of the target speed. It will be defined as severely constrained when the speed is below one-third of the target speed and it will be considered as congested in the middle speed range. This stratification will be used to produce performance measures directly (e.g., percent of time severely constrained). It will also be used in the computation of other performance measures (e.g., release from a queue).

Stop-Related Measures

Stopped delay accrues whenever the vehicle is in the stopped state. The number of stops is incremented each time a vehicle enters the stopped state after reaching the a speed threshold above the severely congested state (i.e., 1/3 of the target speed)

Delay Related Measures

- **Time Step Delay:** The delay on any time step is, by definition, the length of the time step minus the time it would have taken the vehicle to cover the distance traveled in the step at the target speed.
- **Segment Delay:** The time actually taken to traverse a segment minus the time it would have taken to traverse the segment at the target speed.
- **Queue Delay:** The time step delay on any step in which the vehicle is in a queued state, otherwise it is zero. Queue delays are accumulated over all time steps while the vehicle is in a queue.

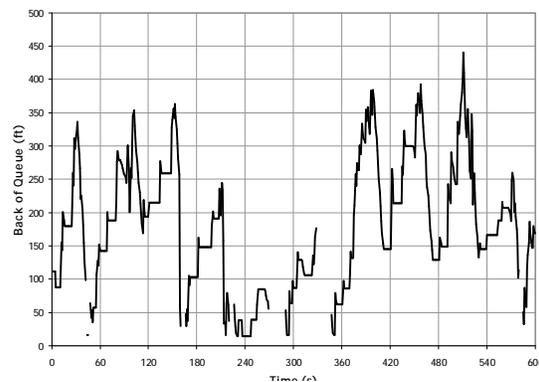


Exhibit 6: Queue Length Fluctuation over 10 Cycles

- *Stopped Delay:* The time step delay on any step in which the vehicle is in a stopped state, otherwise it is zero. Since a vehicle is considered to be “stopped” if it is travelling less than a threshold speed, a consistent definition of stopped delay requires that the travel time at the target speed be subtracted.
- *Control Delay:* The control delay is the additional travel time caused by the operation of a traffic control device. It cannot be computed directly from the vehicle trajectories in a manner consistent with the procedures given in Chapters 18 and 31 for signalized intersection analysis. It is, however, an important measure because it is the basis for determination of the level of service on a signalized approach. The queue delay computed from vehicle trajectories provides a reasonable approximation of control delay when the following conditions are met: 1) the queue delay is caused by a traffic control device; and 2) the identification of the queued state is consistent with the definitions provided in the HCM.

Queue Related Measures

Procedures for computing queue related measures begin with determining whether or not each vehicle in a segment is in a queued state. A vehicle will be in the queued state if it has entered the queue and has not yet left it. The beginning of the queued state will occur when:

- The gap between a vehicle and its leader is less than or equal to 20 ft, and
- The vehicle speed is greater than or equal to the leader speed, and
- The vehicle speed is less than or equal to one-third of the target speed (i.e., the speed is severely constrained).

A separate case must be created to accommodate the first vehicle to arrive at the stop line. If the link is controlled (interrupted flow case) the beginning of the queued state will also occur when:

- No leader is present on the link, and
- The vehicle is within 50 ft of the stop line, and
- The vehicle is decelerating or has stopped.

The ending of the queued state also requires some rules.

For most purposes, the vehicle should be considered to remain in the queue until it leaves the link. Experience with trajectory analysis has shown that other conditions need to be applied to supplement this rule. Thus, the end of queued state also occurs when:

- The vehicle has reached two-thirds of the target speed (i.e., uncongested operation); and
- The leader speed is greater than or equal to the vehicle speed, or the vehicle has no leader in the same link.

The additional conditions cover situations in which, for example, a vehicle escapes a queue by changing lanes into an uncongested lane (e.g., through vehicle caught temporarily in a turn bay overflow).

Queue Length Measures

Chapter 31 prescribes a procedure to estimate the average maximum back of queue on a signalized approach. The maximum queue reach (i.e., back of queue, or BOQ) is a more useful measure than the number of vehicles in the queue, because it is the BOQ that causes blockage of lanes.

Because of its macroscopic nature, the HCM queue estimation procedure cannot be applied directly to simulation. On the other hand, simulation can produce additional useful measures because of its higher level of detail. The first step in queue length determination has already been dealt with by determining the when a vehicle is in a queue. The next step is to determine the position of the last vehicle in the queue.

The BOQ on any step is a relatively simple thing to determine. The trick is to figure out how to accumulate the individual BOQ measures over the entire period. There are several measures that can be produced:

- The maximum BOQ at some percentile value, say, 95%;
- The maximum BOQ on any cycle at some percentile value, say, 95%;
- The historical maximum BOQ (i.e., the longest queue recorded during the period);
- The probability that a queue will back up beyond a specified point; and
- The proportion of time that the queue will be backed up beyond a specified point.

Density-Related Measures

The uninterrupted-flow procedures described in the HCM base their level of service estimates on the density of traffic in terms of passenger cars per mile per lane. In one case (freeway merges and diverges), the density is estimated only for the two lanes adjacent to the ramp. Density computations do not require a detailed analysis of the trajectory of each vehicle. They are best made by simply counting the number of vehicles in each lane on a given segment. For comparable results, it essential to convert the simulated densities in veh/mi/ln to pc/mi/ln, especially if simulation tools are used to evaluate the level of service on a segment.

It is not possible to prescribe a simple conversion process that will ensure full compatibility with the HCM LOS estimation procedures. There are, however, two methods that could produce a practical approximation. Both require determination of the heavy vehicle adjustment factor, f_{HV} , by the method prescribed in Chapter 11 for basic freeway segments. This method is also referenced and used in the procedural chapters covering other types of freeway segments. The simplest approximation may be obtained by running the simulation with known demand flow rates and truck proportions then dividing the simulated density by f_{HV} .

Another approximation involves dividing the demand flow rates by f_{HV} before running the simulation with passenger cars only. The resulting densities will then be expressed in pc/mi/ln. The second method conforms better to the procedures prescribed in Chapters 11 through 13 but the first method is probably easier to apply.

Caliper Corporation

Submitted by Daniel Morgan

Caliper Corporation spent a significant share of the 2009 calendar year enhancing the application programming interface (API) for the current release of its traffic simulation software product TransModeler 2.5. The extended API has been leveraged in various large-scale simulation projects around the United States, including projects under FHWA's Integrated Corridor Management Systems Program and Caltrans' Corridor Systems Management Planning initiative. API applications have been developed by Caliper and by third parties to simulate zone-based and entry-exit-based dynamic road pricing strategies, managed lanes, evacuation strategies, and ramp metering operations. Caliper is making plans in 2010 to extend the API further to allow customization of TransModeler's existing traffic signal timing, signal preemption, and signal priority capabilities.

PTV America

Submitted by Kiel Ova

PTV America's Annual PTV Vision User Group meeting will be held Thursday and Friday, April 22-23, 2010, at The Westin in Seattle, WA. This conference brings together leading transportation researchers, engineers, and planners from across North America to share and learn the latest innovations in PTV Vision software. Last year's event had more than 100 participants from North America. Those interested in submitting papers should send a one-page or less abstract of their related PTV Vision project or research to usersgroup@ptvamerica.com before February 5th, 2010. More information can be found at: <http://www.ptvamerica.com/events-and-news/ptv-vision-users-group-meeting-2010/>.

PTV is also pleased to announce the release of VISSIM 5.20, which will start shipping to North American clients in January 2010. VISSIM continues to set standards with the release of a new 64-bit edition of VISSIM 5.2, taking advantage of Windows 7 and Intel Core i7. The latest version includes new interfaces with Siemens SCOOT and Econolite ASC/3 SIL. Other key improvements include a new vehicle fleet with 100's of models, ability to import Google SketchUp files directly into the VISSIM workspace, and a new macroscopic assignment procedure for dynamic assignment.

The VISSIM social force pedestrian model continues development with direct integration with transit vehicles, allowing for detailed passenger loading and alighting simulation of transit stops and stations. Several new features have been added for the setup and analyses of pedestrian facilities.

Customers with active maintenance are eligible for the free upgrade to VISSIM 5.2, upgrades to 64-bit editions may require a new dongle. Existing and prospective customers can contact sales@ptvamerica.com for more information.

Academic agencies owning PTV Vision software are eligible for free classroom licenses for teaching and laboratory exercises. Send your request to updater@ptvamerica.com for instructions.

More information at: <http://www.ptv-vision.com/traffic/software-system-solutions/vissim/>

COST Action TU0903 - Methods and Tools for Supporting the Use, Calibration, and Validation of Traffic Simulation Models .

Submitted by Rich Cunard

COST Action TU0903 (http://w3.cost.esf.org/index.php?id=240&action_number=TU0903) has recently been launched in Europe and is funded by the European Union COST programme (Cooperation in the field of Scientific and Technical Research), running until late 2013 with workshops and meetings being held approximately every 3 months.

The main objective of the Action is to develop, implement and promote the use of methods and procedures for supporting the use of micro traffic simulation models, especially on the topics of model calibration and validation.

To date, the bulk of resources and effort in the field of traffic simulation have focused on "model development", leading to many models being available, which are used extensively in transport applications.

However the fidelity of results and conclusions drawn from such studies, as well as the range of possible applications the tools can reliably be used for, are questionable: for example the same simulation study carried out by different people, even when using the same tool, is likely to give different results. This is compounded by the increasing complexity of models making appropriate and correct use a difficult task even for experts. TU0903 therefore seeks to develop, implement and promote methodologies and procedures to support the use of traffic simulation, covering issues such as:

- Data availability and quality: simulators, instrumented vehicles and trajectory datasets
- The relationship between data accuracy and calibration, as well as parsimony, over-fitting and transferability
- The development of a general methodology for drawing inference about the impact of model parameters on model outputs.
- The development and implementation of methodologies, suitable for deterministic as well as stochastic models, for estimating traffic model parameters.

While the project has a direct relationship with AHB45 (Traffic Flow Theory and Characteristics) there is a clear tie-in to the activities and interests of a range of other committees which utilize simulation at different levels and for different purposes, including: AHB15 Intelligent Transportation Systems, AHB30 Vehicle-Highway Automation, AHB40 Highway Capacity and Quality of Service, AND10 Vehicle User Characteristics, AND30 Simulation and Measurement of Vehicle and Operator Performance and ABJ70, Artificial Intelligence and Advanced Computing Applications.

The TU0903 Steering Committee would therefore like to hear from those with an interest in the development and use of simulation, and welcomes comments from TRB Committee members and friends. To be added to our mailing list please contact TU0903 Chairman, Vincenzo Punzo (vinpunzo@unina.it) and Dissemination leader, Mark Brackstone (mark.brackstone@egis-mobilite.co.uk).

We look forward to hearing from you and hope you will join us in what we hope will be an interesting and fascinating project to take forward the future of simulation modelling.

Events of Possible Interest during TRB 2010

Type	No.	Sponsor	Location	Function Title	Time
Workshop	102	W102	M - Washington B6	Doctoral Student Research in Transportation O	Jan 10 09:00 AM - 12:00PM
Workshop	164	AHB45	Shoreham, Palladian	Modeling Congestion Pricing Impacts	Jan 10 2010 1:30PM- 4:30PM
Workshop	152	ABJ50	Marriott, Balcony D	Remote-Sensing Technologies for Transportat	Jan 10 2010 1:30PM- 4:30PM
Workshop	134	AHB25	Marriott, Thurgood Marshall North	Emerging Issues in Traffic Signal Systems: Air C	Jan 10 2010 9:00AM- 5:00PM
Session	302	AHB40	Marriott, Salon 3	What Is New in Highway Capacity: 2010 Highw	Jan 11 2010 1:30PM- 3:15PM
Session	271	AHB70	Marriott, Thurgood Marshall West	Using Statistical and Microsimulation Models f	Jan 11 2010 10:15AM- 12:00PM
Session	202	AHB20	Marriott, Salon 3	Innovations in Freeway Operations	Jan 11 2010 8:00AM- 9:45AM
Session	427	S427	H - International West	Eisenhower Fellowship Program Research Sho	Jan 12 08:00 AM - 12:00 PM
Session	530	AHB65	Marriott, Salon 3	Intersection Design: Safety and Operational Ef	Jan 12 2010 3:45PM- 5:30PM
Session	560	AHB45	Marriott, Delaware A	Car-Following Behavior and Driver Heterogene	Jan 12 2010 7:30PM- 9:30PM
Session	409	AHB45	Marriott, Maryland C	Traffic Flow Theory Applications	Jan 12 2010 8:00AM- 9:45AM
Session	675	AHB25	Marriott, Thurgood Marshall North	Traffic Control in Oversaturated Conditions	Jan 13 2010 2:30PM- 4:00PM
Session	676	AHB45	Marriott, Thurgood Marshall East	Traffic Simulation Evaluation and Applications	Jan 13 2010 2:30PM- 4:00PM
Session	694	AHB25	Marriott, Thurgood Marshall North	Performance Measures for Today's Traffic	Jan 13 2010 4:30PM- 6:00PM
Poster Session	376	P376	M - Salon 2	Emergency Evacuation Research	Jan 11 07:30 PM - 9:30 PM
Poster Session	379	P379	M - Salon 2	Intelligent Transportation Systems	Jan 11 07:30 PM - 9:30 PM
Poster Session	380	P380	M - Salon 2	Level of Service for Signalized Intersections	Jan 11 07:30 PM - 9:30 PM
Poster Session	238	P238	M - Salon 2	High-Occupancy-Vehicle, High-Occupancy-Toll	Jan 11 09:30 AM - 12:00 PM
Poster Session	250	P250	H - International Center	Artificial Intelligence and Advanced Computin	Jan 11 09:30 AM - 12:00 PM
Poster Session	320	AHB20	Marriott, Salon 2	Freeway Operations	Jan 11 2010 2:30PM- 5:00PM
Poster Session	324	AHB20	Marriott, Salon 2	Ramp Metering and Incident Management	Jan 11 2010 2:30PM- 5:00PM
Poster Session	384	AHB30	Marriott, Salon 2	Vehicle-Highway Automation	Jan 11 2010 7:30PM- 9:30PM
Poster Session	430	AHB25	Marriott, Salon 2	Multimodal Traffic Signal Management	Jan 12 2010 9:30AM- 12:00PM
Poster Session	432	AHB50	Marriott, Salon 2	Traffic Control Devices	Jan 12 2010 9:30AM- 12:00PM
Poster Session	435	AHB55	Marriott, Salon 2	Work-Zone Speed and Merge Control Strategi	Jan 12 2010 9:30AM- 12:00PM
Poster Session	627	AHB45	Marriott, Salon 2	Research in Traffic Flow Theory and Characteri	Jan 13 2010 9:30AM- 12:00PM
Poster Session	628	AHB45	Marriott, Salon 2	Research in Traffic Flow Theory and Characteri	Jan 13 2010 9:30AM- 12:00PM
Poster Session	629	AHB25	Marriott, Salon 2	Traffic Signal Control, Modeling, and Optimiza	Jan 13 2010 9:30AM- 12:00PM
Meeting		AHB40(3.1)	M - Coolidge	Signalized Intersections Subcommittee	Jan 09 01:00 PM - 2:45 PM
Meeting		AHB40	Marriott, Coolidge	Traffic Simulation and Applications Subcommi	Jan 09 2010 4:15PM- 5:45PM
Meeting		NGSIM	S - Ambassador	NGSIM meeting	Jan 10 09:00 AM - 12:00PM
Meeting		AHB20	Marriott, Tyler	Freeway Simulation Subcommittee, AHB20(2)	Jan 10 2010 5:00PM- 6:00PM
Meeting		AHB40	Marriott, Wilson B & C	Highway Capacity and Quality of Service Comn	Jan 10 2010 7:30PM- 9:30PM
Meeting		AHB25(4)	M - Balcony D	Traffic Signal Controller Architecture Subcomm	Jan 11 10:00 AM - 11:00 AM
Meeting		AHB45	Marriott, Wilson B & C	Traffic Simulation Models Joint Subcommittee	Jan 11 2010 7:30PM- 9:30PM
Meeting		AHB40	Marriott, Wilson B & C	Highway Capacity and Quality of Service Comn	Jan 11 2010 8:00AM- 12:00PM
Meeting		AHB25	Marriott, Balcony D	Simulation of Traffic Signal Systems Subcomm	Jan 11 2010 8:00AM- 9:00AM
Meeting		AHB25	M - Wilson B & C	Traffic Signal Systems Committee	Jan 12 01:30 PM - 3:15 PM
Meeting		AHB25	M - Washington B3	Traffic Signal Systems Committee	Jan 12 07:30 PM - 9:30 PM
Meeting		AHB25	Marriott, Wilson B & C	Traffic Signal Systems Committee	Jan 12 2010 1:30PM- 3:15PM
Meeting		AHB45	Marriott, Washington B5	Traffic Flow Theory and Characteristics Commi	Jan 12 2010 3:45PM- 5:30PM
Meeting		AHB25	Marriott, Washington B3	Traffic Signal Systems Committee	Jan 12 2010 7:30PM- 9:30PM
Meeting		AND30	M - Washington B5	Simulation and Measurement of Vehicle and C	Jan 13 08:00 AM - 12:00 PM