

## User Needs Task Group

2022-04-11 – Third Meeting

**The following summarizes the main items discussed:**

- Chris Melson provided an update on the annual traffic simulation survey:
  - In mid-January: John Shaw finalized the survey based on comments from the Task Group. The survey can be accessed via [this link](#).
  - In mid-February: Chris widely disseminated the survey via the SimSub e-mail listserv, SimSub's TRB liaison committees, the ITE SimCap Committee, and the main traffic simulation vendors.
  - Currently: the survey has received over 180 responses.
- John Shaw shared preliminary results of the survey—walking through aggregated responses to each question. Please see these results in the attached document.
- Results of note include:
  - Majority of respondents were consultants (42%), followed by academics (26%), and state DOT personnel (13%). [Question Q1.2]
  - Majority of the subject simulation projects involved microsimulation (66%), followed by mesoscopic (11%), and macroscopic (10%) studies. This is likely due to the focus of the study and how it was disseminated. [Question Q3.1]
  - Based on the above, it was surprising to see such large networks being simulated: 42% being larger than 21 CL miles, including 11% being larger than 501 CL miles. [Question Q3.2]
  - The purpose of the subject simulation projects were to evaluate freeway operations (40%) and arterial operations (37%). [Question Q3.4]
  - The most difficult issues encountered (RE the subject simulation project) included: the reasonableness of vehicle paths/route choices under future conditions, reasonableness of future traffic speeds/delays (e.g., model “locking up”), LOE required to replicate existing traffic patterns, maintaining consistency with other models or forecasts, and managing unrealistic stakeholder expectations. [Question Q3.5]
  - RE ACP80 activities to pursue, respondents were most interested in publication of technical guidelines (64%), webinars on building and calibrating models (24%), and webinars on when to use simulation (18%). [Question Q5.1]
- Discussion topics of note include:
  - The Task Group discussed the significant effort required to develop such large networks (which in turn, requires a large staff). The Task Group would like to see this question [Question Q3.2] categorized by project type/resolution (microscopic, mesoscopic, macroscopic, etc.).
  - The Task Group generally agreed with the most difficult issues encountered [Question Q3.5]. This included a brief discussion on the difficulty of replicating queue lengths in the model (which may not be calculated directly or correctly) as compared to field counts—especially when there is queue spillback. This is a possible webinar topic.
  - The Task Group also discussed the difficulty of modeling congested networks (e.g., model lock up, bottlenecks at network loading points, unmet demand)—and how to interpret the large variation in model results in this condition. Some models may have 50% - 100% in variation; how are agencies to make decisions with this high variation?

- The above bullet may also play into the difficulty of “unrealistic stakeholder expectations”—and simulating scenarios which may not appropriately address the transportation issue.
- The Task Group was surprised that “difficulty interpreting results” was not rated higher in difficulty.

**Action items:**

- Provide and communicate an official deadline to the survey (mid-April) [Chris]
- Better compile and report results (e.g., grouping results by organization type, combining first and second subject simulation project results, etc.) (end of May) [Chris]
- Compiling list of possible actions to address issues raised in the survey (mid-June) [Chris]
- Schedule another meeting to discuss finalized results and potential actions with Task Group (early July) [Chris]

## 2021-07-26 – Second Meeting

### The following summarizes the main items discussed:

- Barring no major feedback from the recent Joint SimSub/SimCap Meeting (6/25), the group decided to pursue developing an annual survey. The survey will identify: (1) the primary uses of traffic simulation, (2) analyzed applications, and (3) corresponding user needs.
- John Shaw with assistance from Chris Melson will develop the initial draft of the survey. The group will be able to provide comment on the draft in early September – with the intention to present the survey at the ACP80 Summer Meeting (September 15 – 16).
- The group discussed the need for guidance in determining the appropriate level of calibration effort required, based on what is being evaluated and what decision is to be made.
  - Details of the analysis (tool selection, calibration effort, etc.) will depend on the problem being solved, the solution being investigated, and the operational context.
  - It is unclear if there is specific guidance on this – especially guidance on converting the above methodology into policy.
  - It may be appropriate for this group to pursue defining what types of problems are suited for simulation, and also where simulation is NOT appropriate.
- The group also discussed information to be collected in the survey:
  - What transportation problems simulation is being applied to;
  - What solutions simulation is investigating;
  - The decision process used to determine when to utilize simulation;
    - Related: what stage in the process is simulation being performed;
  - If agencies are using simulation to evaluate emerging technology – and if this has been a motivating factor for adoption;
  - What performance measures are used in simulation;
  - What budgets are being put aside for simulation (they may not be realistic); and
  - Asking about the level of calibration effort.
- The annual survey may not be able to answer all these questions – likely need to be more focused and concise. However, this information may be included in a supplemental survey the group can disseminate when needed.

### Action items:

- Develop initial draft of annual survey (8/23) [John with assistance from Chris]
- Disseminate draft to group for comment and meet to discuss (9/2) [Chris]
- Present survey at ACP80 Summer Meeting (9/15) [John/Chris]

## 2021-06-04 – Initial Meeting

### Activities to pursue (as a Task Group):

- Review previously collected user needs and their varied sources (e.g., discussions from the [Workshop on Traffic Simulation and CAV Modeling](#), previous [ITE SimCap](#) surveys, previous SimSub efforts, etc.).
- Develop and disseminate annual survey identifying: (1) the primary uses of traffic simulation, (2) analyzed applications, and (3) corresponding user needs.
  - It was discussed how user needs will vary based on what decision is being made (i.e., will vary if used for project screening, project prioritization, project planning, in-depth operational analysis of alternatives, etc.). User needs will also vary depending on the application being analyzed (e.g., visualizations may be important for showing how traffic will flow through a new, innovative intersection, but may not be important for making decisions based off performance metrics).
  - The annual survey will be able to track how (1), (2), and (3) change over time. It will also identify recurring user needs.
  - The annual survey may require coordination with liaison committees, as user needs related to input data may also arise (e.g., relying on forecast from a planning model).
- Review annual survey and recommend how user needs may be addressed (i.e., through educational efforts, research, etc.). [This wasn't discussed in-depth, but wanted to include]

### Action items:

- Task group to present what was discussed at the [upcoming SimSub meeting](#) (6/25) [Mike]
- Schedule next Task Group meeting (within one month after 6/25 meeting) [Shalini]