Overview of Survey: The TRB Standing Committee on Traffic Simulation (ACP80) conducted a survey to better understand the current uses and common challenges of traffic simulation. The specific intent of the survey is to identify: (1) the primary uses of traffic simulation, (2) analyzed applications, and (3) corresponding user needs. The survey is anticipated to be conducted annually, such that (1), (2), and (3) can be tracked overtime and to identify recurring user needs.

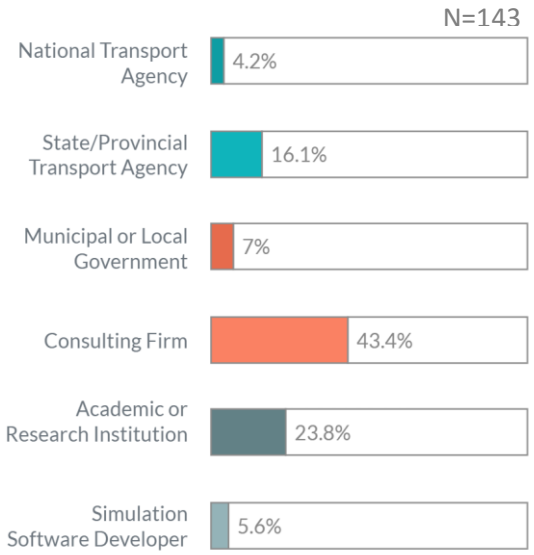
The survey was developed by SimSub's User Needs Task Group in January 2022. It was widely disseminated February thru May 2022 via the SimSub e-mail listserv, SimSub's TRB liaison committees, the ITE SimCap Committee, and the main traffic simulation vendors.

Purpose of Document: This document presents the main results of the survey.

Contact: If you have any questions or feedback RE the survey and summary document, please contact the Co-Chairs of SimSub: Chris Melson (cmelson1@lsu.edu) or John Shaw (jwshaw@iastate.edu).

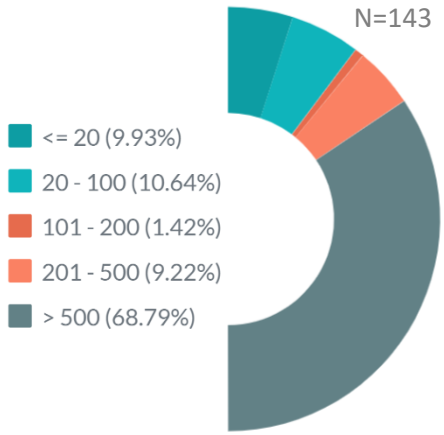
Respondent Organizational Information

Organization Type

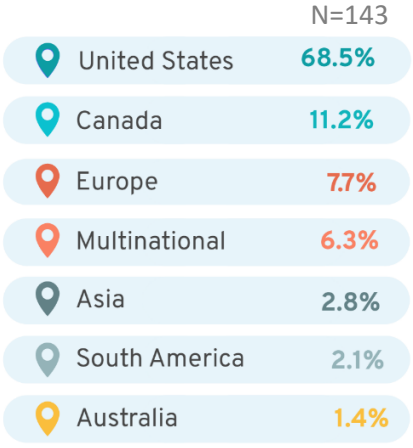


Organization Size

(# of Employees)

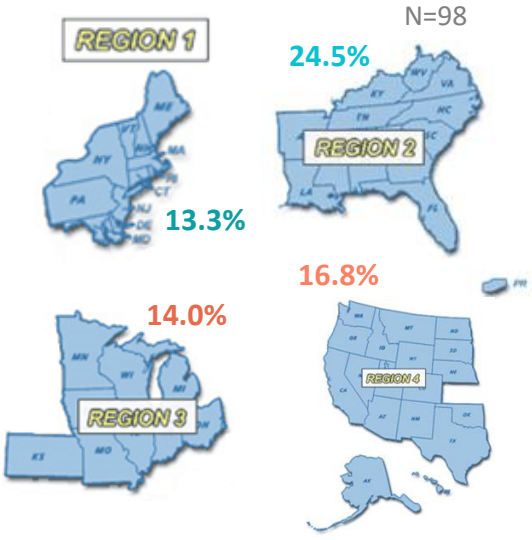


Location



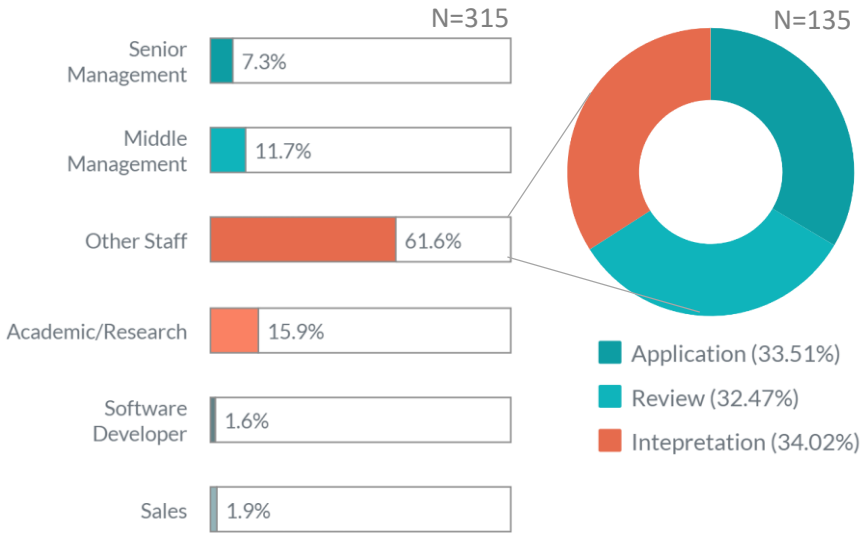
Location (w/in U.S.)

(by AASHTO Regions)



Respondent Individual Information

Organizational Role

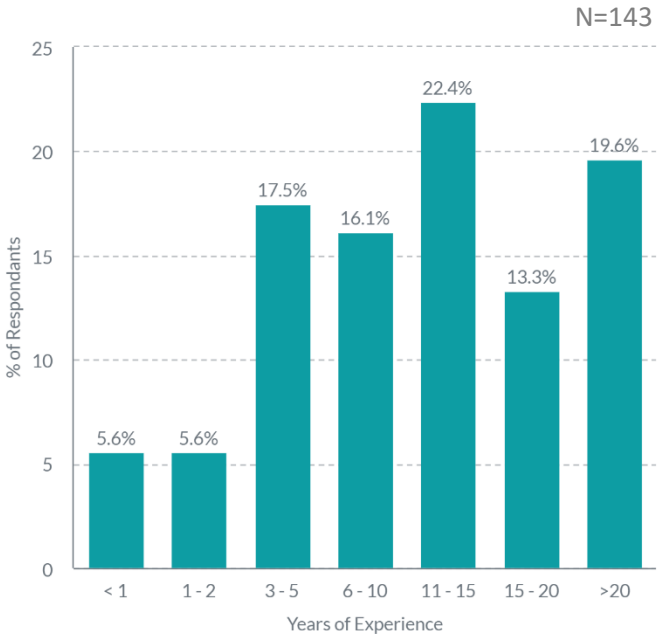


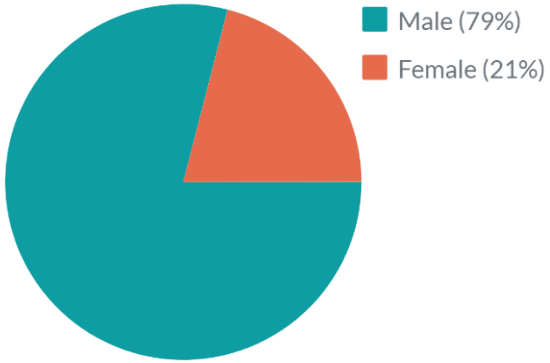
NOTE: Options not mutually exclusive.

NOTE: Reported Senior Management and Middle Management roles also included application, review, and interpretation of simulation models.

Years of Experience

(in simulation modeling)





Gender

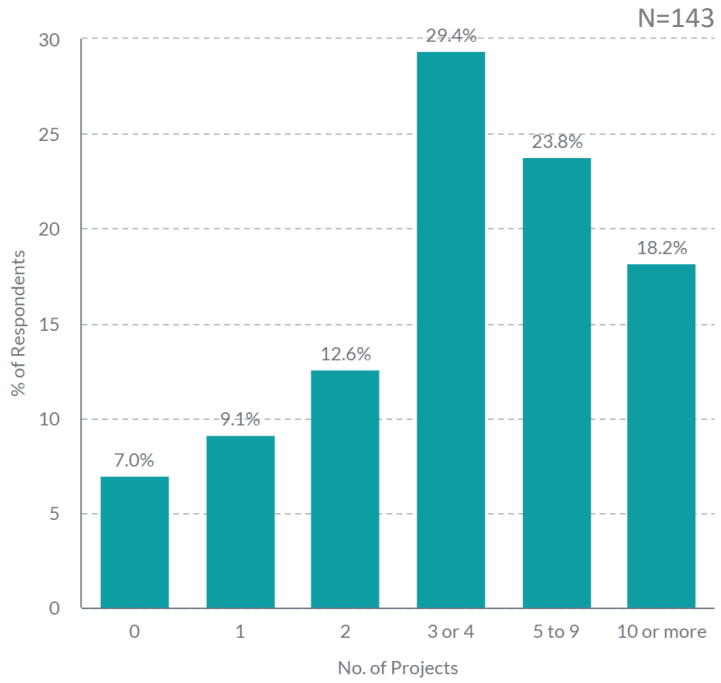
NOTE: Generally, there is the same representation of males and females across organization type and organization roles.

NOTE: Biggest difference between males and females is in years of experience. 48.3% of females have <= 5 yrs of experience (compared to 18.8% of males). 62.1% of females have <= 10 yrs of experience (32.1% of males). 6.9% of females have >20 yrs of experience (17.5% of males).

Traffic Simulation Project Information

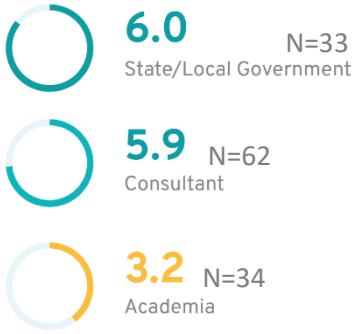
of Projects

(respondent has worked in the past year)



Avg. # of Projects

(by organization type)



NOTE: To calculate an average, assumptions were made to convert collected data (ordinal bins) to cardinal data.

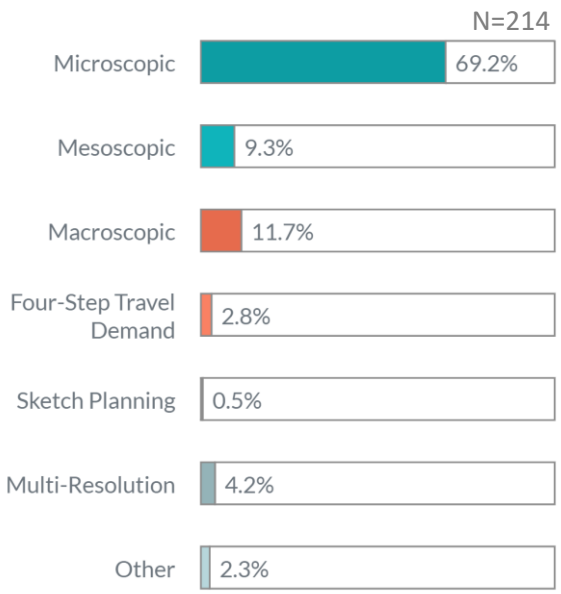
NOTE: There didn't appear to be a relationship between the size of the organization and number of projects.

NOTE: Of those that didn't work on any simulation projects, 30% reported that the lack of technical training was a factor. This group of respondents included federal government [1], state government [1], consultants [4], and academia [4].

Traffic Simulation Project Information

Type of Simulation Model

(RE the most challenging simulation project)

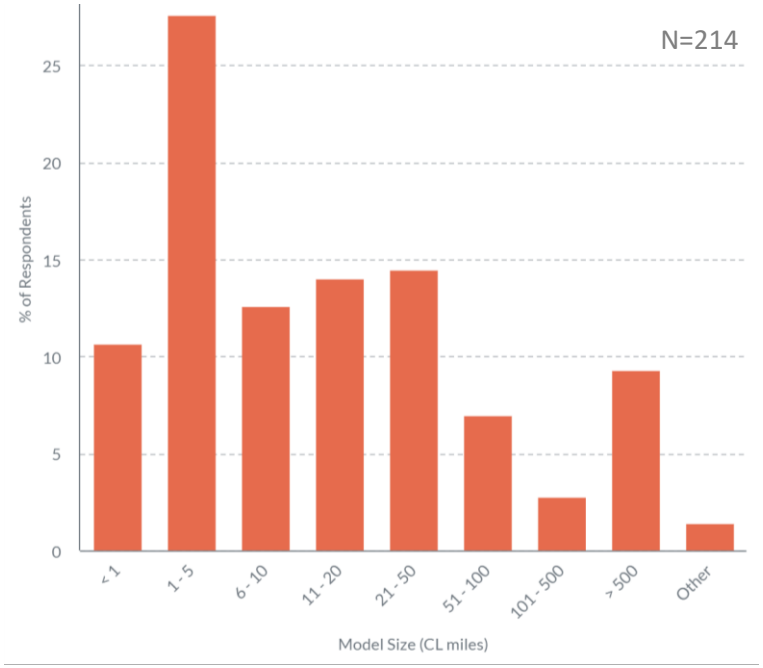


NOTE: Responses in the "Other" category included: (a) combination of a four-step model and microsimulation, (b) all of the listed model types, (c) hybrid model that includes both mesoscopic and microscopic elements, and (d) a model that includes sketch planning, four-step, highway assignment, and microsimulation.

NOTE: To calculate an average, assumptions were made to convert collected data (ordinal bins) to cardinal data.

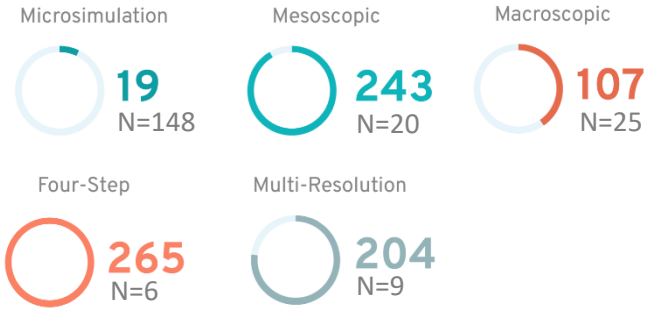
Size of Simulation Model

(RE the most challenging simulation project; CL miles)



Avg. Size of Simulation Model

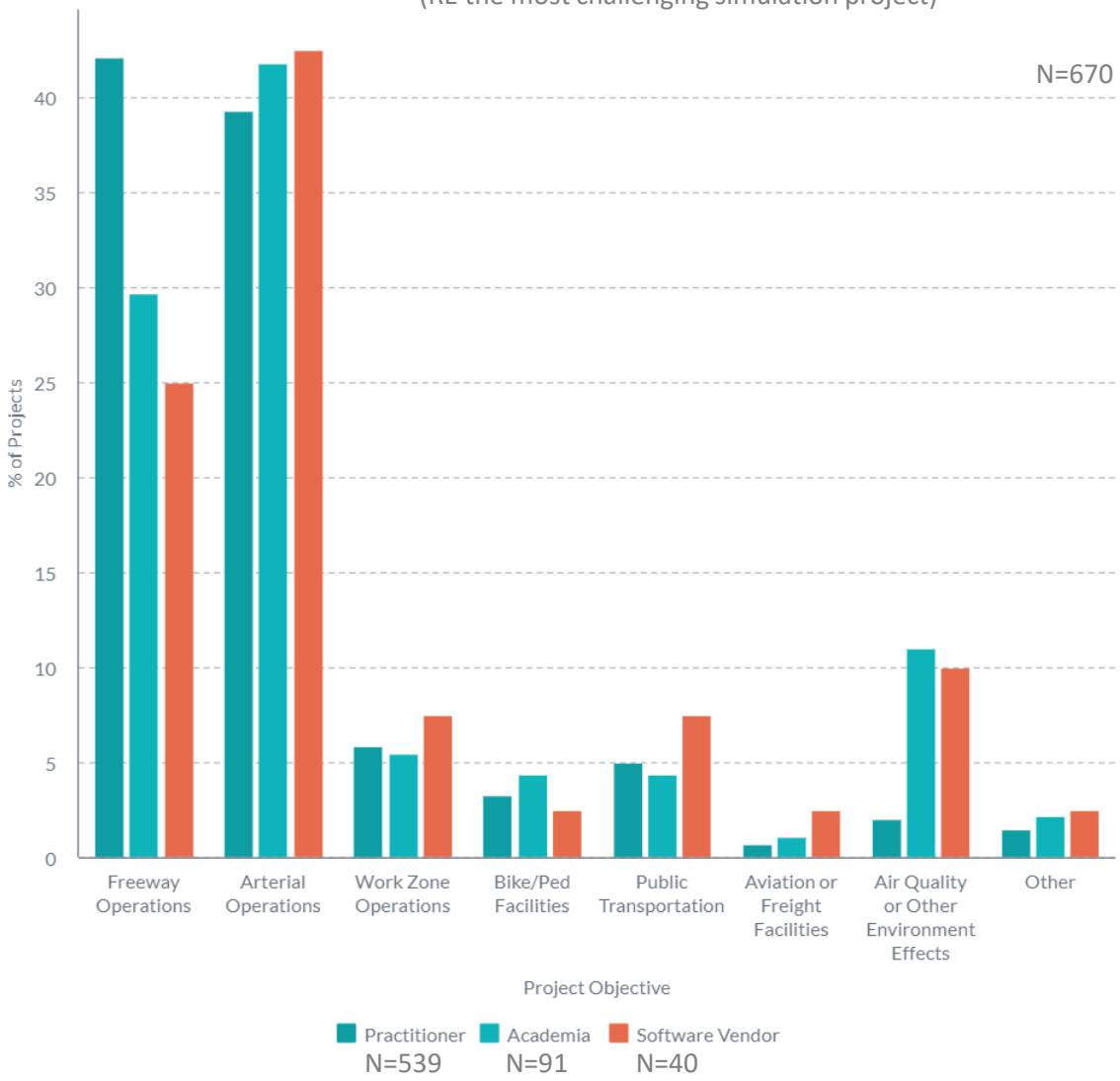
(by model type; CL miles)



Traffic Simulation Project Information

Main Objective of Simulation Model

(RE the most challenging simulation project)



NOTE: Options not mutually exclusive.

NOTE: "Practitioner" category includes federal agencies, state agencies, local government, and consultants. These were combined due to their generally similar responses.

NOTE: There were some minor, but interesting differences between some responses (by organization type) within the "Practitioner" category. These include: (1) higher federal interest in freeway operations [53.8%], (2) higher local interest in bike/ped facilities [5.5%], (3) higher local interest in aviation/freight facilities [5.5%], and higher local interest in air quality/other environmental effects [5.5%].

NOTE: Responses in the "Other" category primarily comprised of toll and revenue forecasting, but also included: analyzing micro mobility models, real-time simulation, and research of calibration methodologies.

Traffic Simulation Project Information

Model Features

(RE the most challenging simulation project)

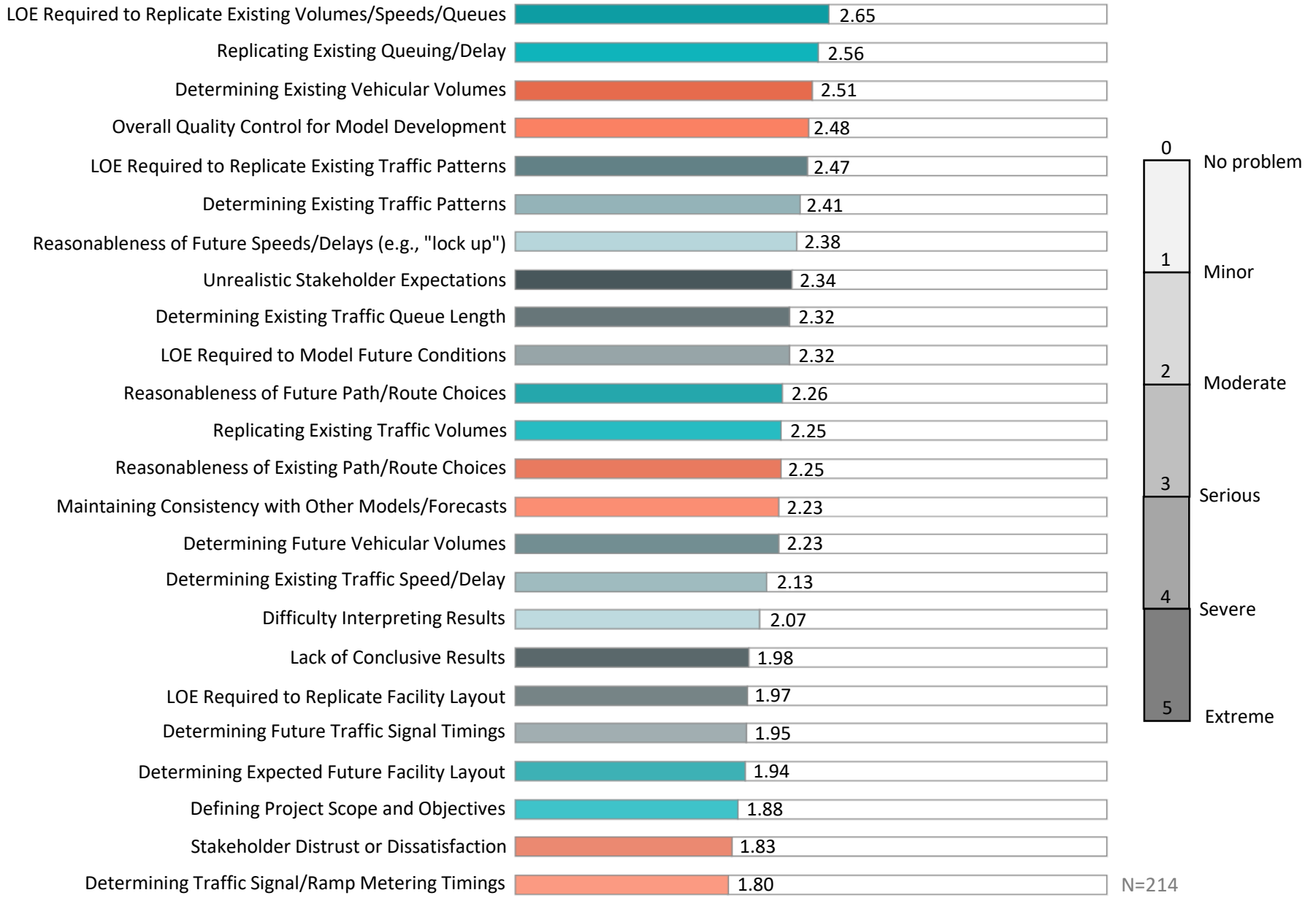
NOTE: Options not mutually exclusive.

NOTE: "Practitioner" category includes federal agencies, state agencies, local government, and consultants. These were combined due to their generally similar responses.

NOTE: "TSMO Strategies" includes the following survey responses: ramp metering, transit signal priority, and ITS devices.

NOTE: Responses in the "Other" category primarily comprised of managed lanes (HOV/HOT/VSL/hard shoulder running).

Difficulties Encountered during Model Development



Difficulties Encountered during Model Development

Top 5 Difficulties
(by organization type)

Public Agency
N=60

1	Overall Quality Control for Model Development	2.75
2	Determining Existing Traffic Patterns	2.66
3	LOE Required to Replicate Existing Volumes/Speeds/Queues	2.64
4	LOE Required to Replicate Existing Traffic Patterns	2.61
5	Replicating Existing Queuing/Delay	2.57

Consultant
N=96

1	Unrealistic Stakeholder Expectations	2.70
2	LOE Required to Replicate Existing Volumes/Speeds/Queues	2.69
3	Replicating Existing Queuing/Delay	2.65
4	Reasonableness of Future Speeds/Delays (e.g., "lock up")	2.58
5	Determining Existing Vehicular Volumes	2.58

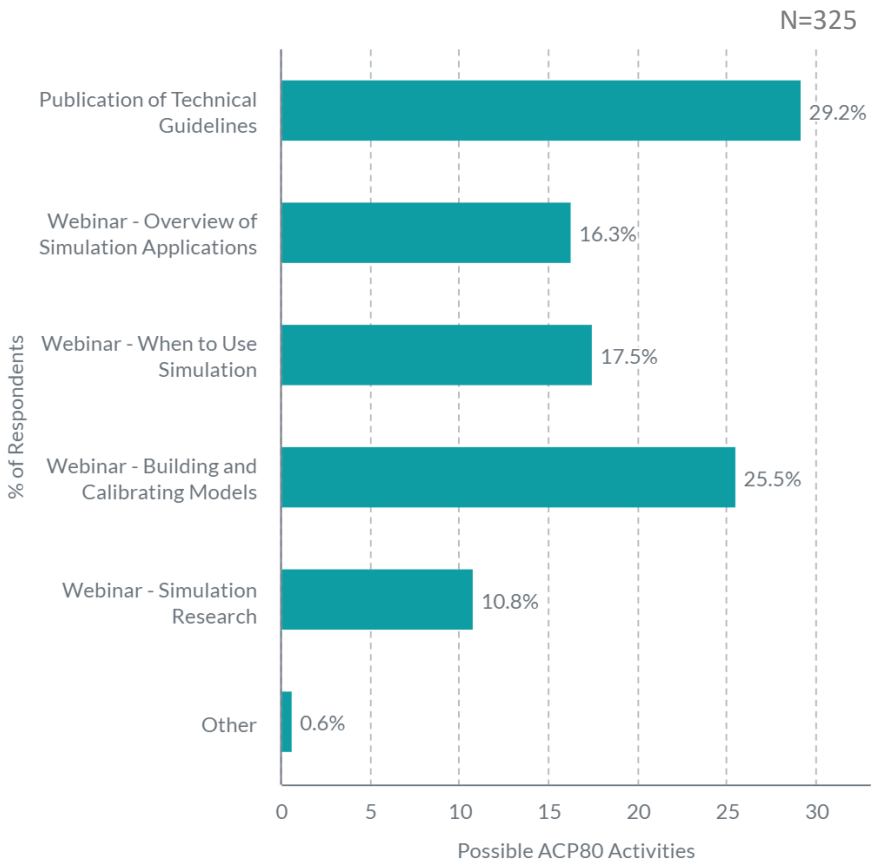
Academia
N=44

1	LOE Required to Replicate Existing Volumes/Speeds/Queues	2.49
2	Determining Existing Vehicular Volumes	2.39
3	Overall Quality Control for Model Development	2.37
4	Replicating Existing Queuing/Delay	2.24
5	LOE Required to Replicate Existing Traffic Patterns	2.24

Software Vendor
N=14

1	Overall Quality Control for Model Development	3.42
2	Determining Existing Traffic Patterns	3.42
3	Reasonableness of Existing Traffic Patterns	3.33
4	LOE Required to Replicate Existing Volumes/Speeds/Queues	3.17
5	Replicating Existing Queuing/Delay	3.08

Activities ACP80 should Pursue



NOTE: Options not mutually exclusive.

NOTE: Responses in the "Other" category included: (a) webinar on large scale multi-modal simulation projects, and (b) documenting best practices in multi-resolution modeling.

More Information: If interested in more detailed results, please visit the website below [under the Task Groups/User Needs subsection]. It contains the survey document, results of each survey question, the survey data set, and the Excel spreadsheet used to conduct the analysis.

https://simcap.eng.lsu.edu/simsub/