

How Does Modeling and Forecasting Support Performance-Based Planning? Results of an MPO Survey

Colby M. Brown, AICP PTP

David J.-H. Lee, Ph.D.

Performance-Based Planning

- MAP-21 places unprecedented emphasis upon the importance of performance-based transportation planning.
- MPOs are now required to set targets for improvements in performance metrics to be achieved by regional long-range plans
- These targets should address national performance goals set by the U.S. DOT

Forecasting System Performance

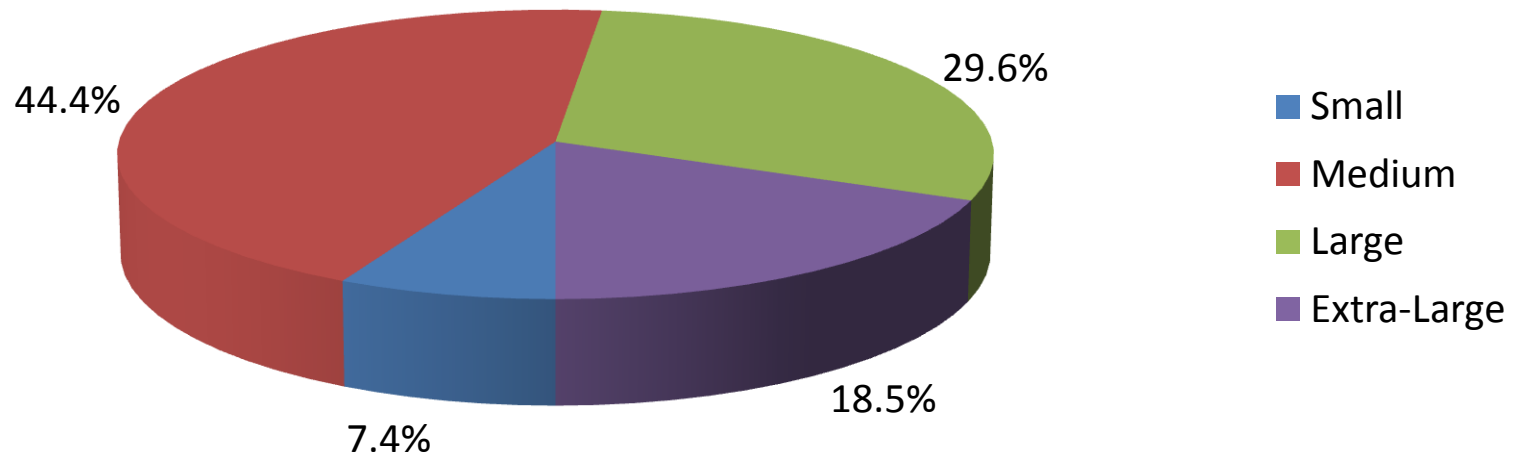
- A foundation for congestion performance measurement and forecasting already exists among transportation management agencies which maintain travel demand models
- The embrace of performance management by transportation planning agencies could potentially strengthen the role that these models play in defining policy objectives

MPO Survey

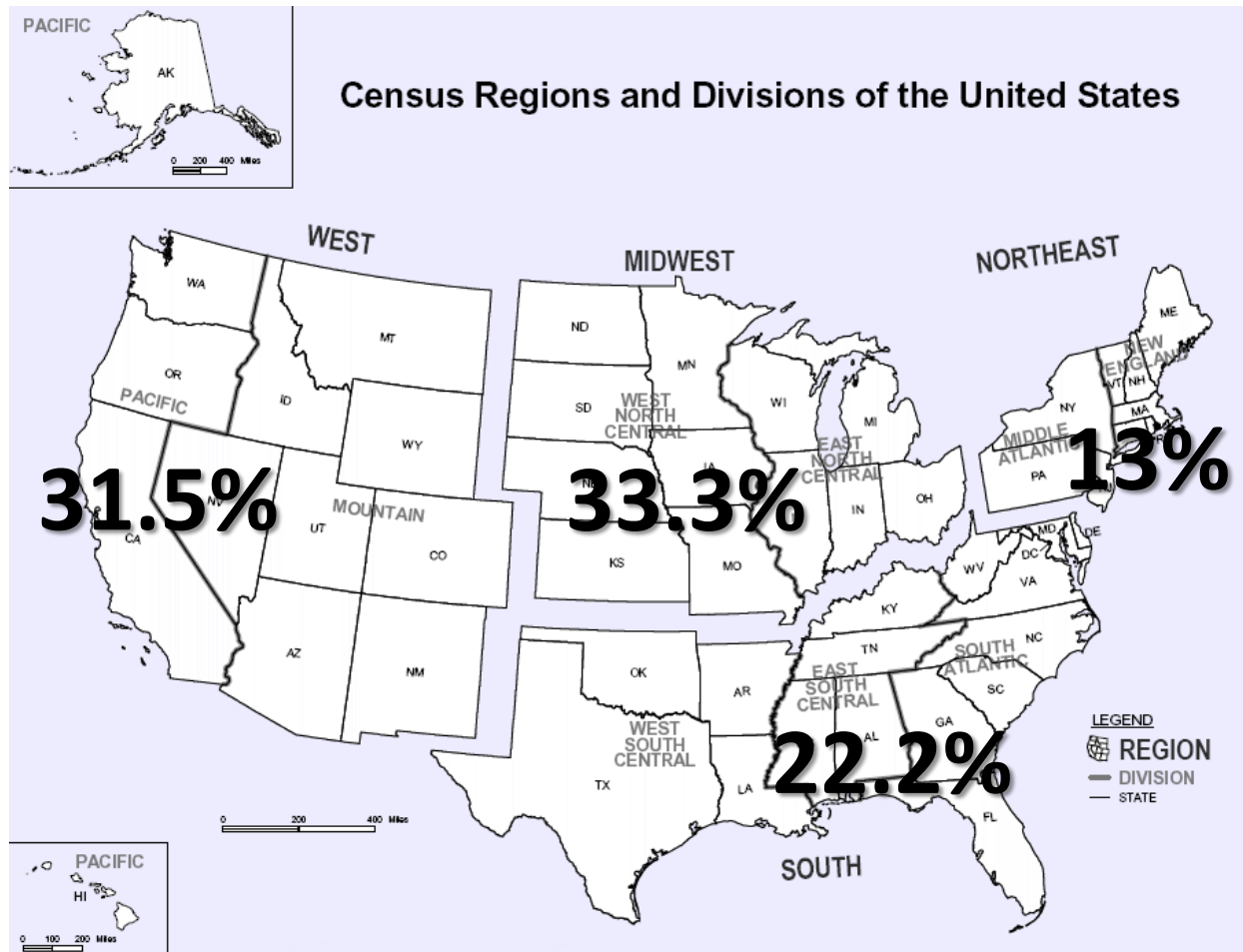
- Conducted by Citilabs in Summer 2013 with guidance from Dr. Lee at Georgia Tech
- Dual motivations:
 - Update Dr. Lee's 2009 MPO modeling survey
 - Investigate how modeling and forecasting activities at MPOs might be affected by MAP-21
- Web-based survey using Constant Contact with mailing list of MPO managers & modelers

Sample Characteristics

- N = 100 MPOs responded to the survey (approximately 29% of all 342 in the USA)
- Anonymous survey; about 54 respondents provided some form of contact information
- Distribution by size:



Geographic Response Distribution



Use of performance measures

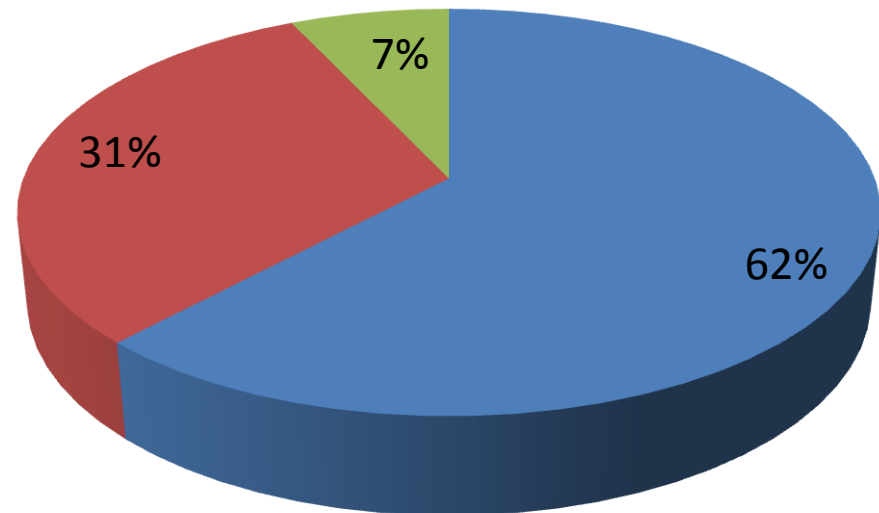
Most agencies are already using performance measures to develop long-range transportation plans.

Fun Fact:

The percentage is slightly higher for Cube users (70%) than the average.

Did your agency utilize performance measures in developing its most recent long-range transportation plan?

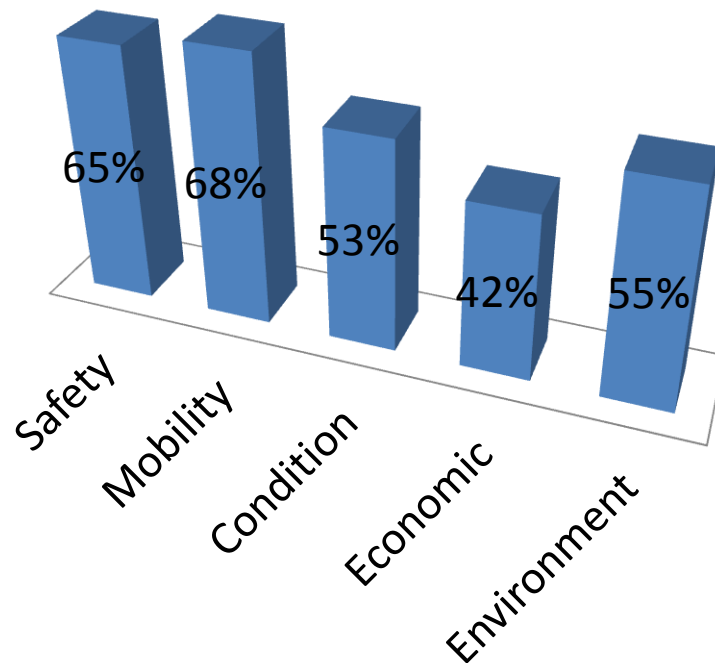
■ Yes ■ No ■ No Response



Types of performance measures used

Mobility performance measures are the most commonly used type, followed by safety, environment, and condition. Economic performance measures are the least common.

Please indicate which categories of performance measures were used to develop the most recent long-range transportation plan.

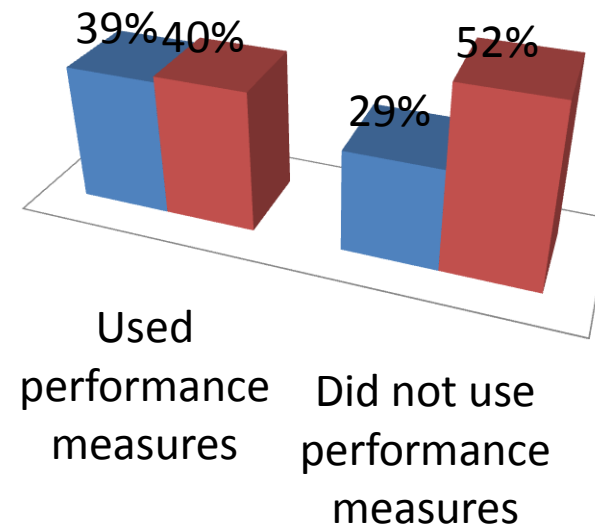


Scenario evaluation

Agencies that used performance measures were also likelier to have evaluated the performance of alternative future scenarios in the development of their most recent long-range transportation plans.

Did your agency evaluate alternative future scenarios as part of the development of its most recent long-range transportation plan?

■ Used scenarios ■ Did not use scenarios

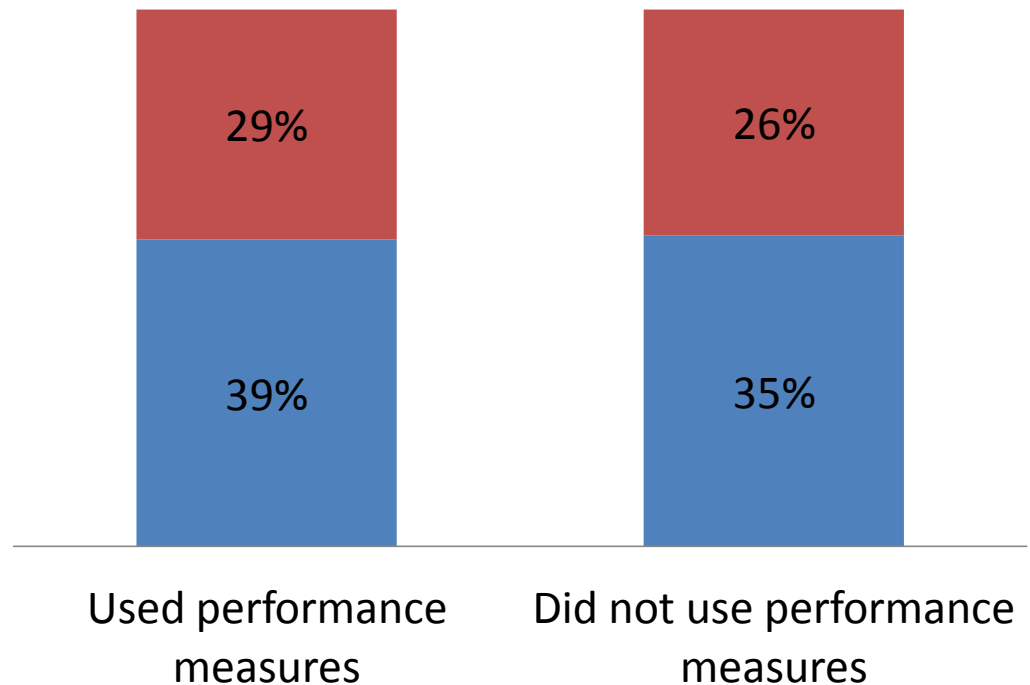


Land use modeling

After accounting for non-response, the percentage of agencies developing scenarios using land use modeling tools was similar for those that used performance measures and those that did not in their last transportation plan.

Has your agency used land use modeling tools to develop alternative future scenarios?

- Used land use models
- Did not use land use models

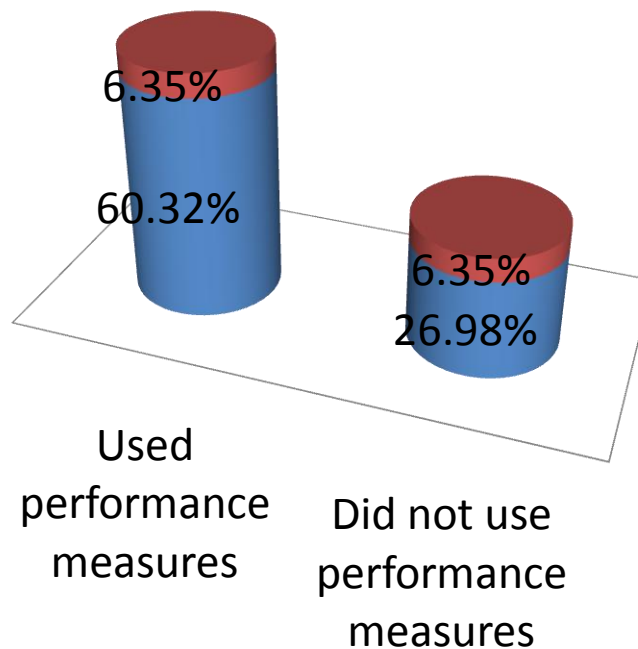


Travel demand modeling

Most agencies use travel demand models. However, the percentage of agencies using performance measures who also use travel demand models is much higher than the percentage of agencies not using performance measures who nonetheless use a travel demand model.

Does your agency use a travel demand model?

- Used travel demand models
- Did not use travel demand models



Travel demand model type

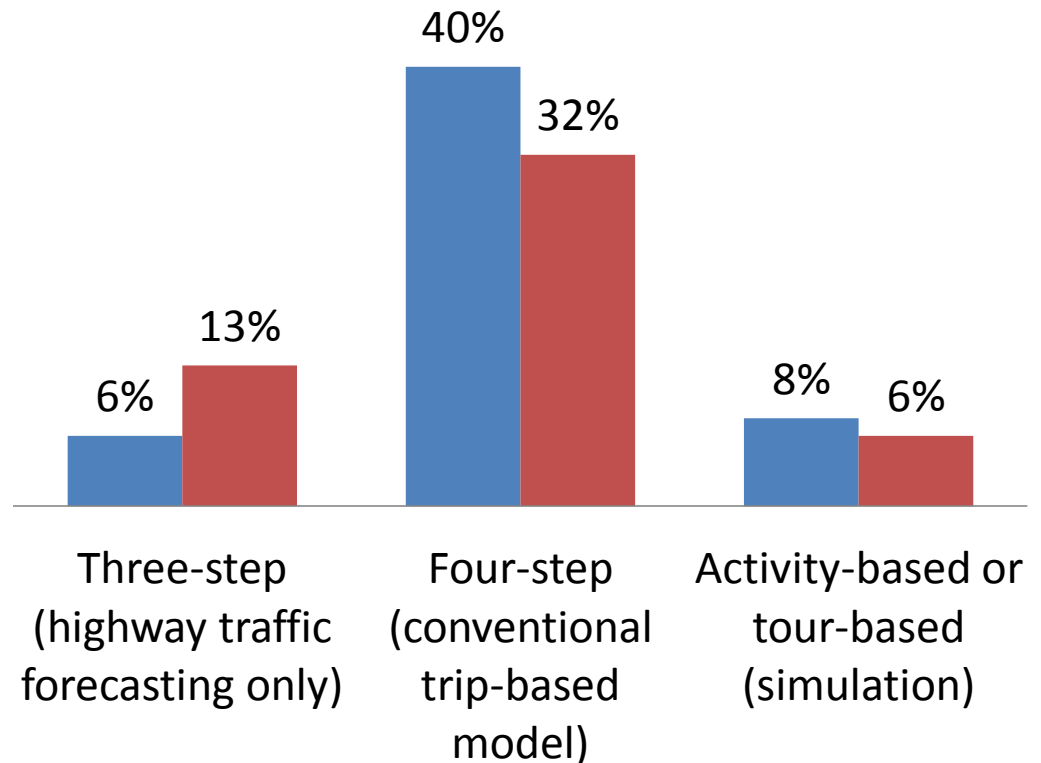
Most agencies have conventional, trip-based, “four-step” travel demand models.

Agencies with three-step traffic forecasting models were likelier not to use performance measures.

Agencies with activity-based or tour-based models were only slightly likelier to use performance measures.

What type of travel demand model does your agency use?

- Used performance measures
- Did not use performance measures

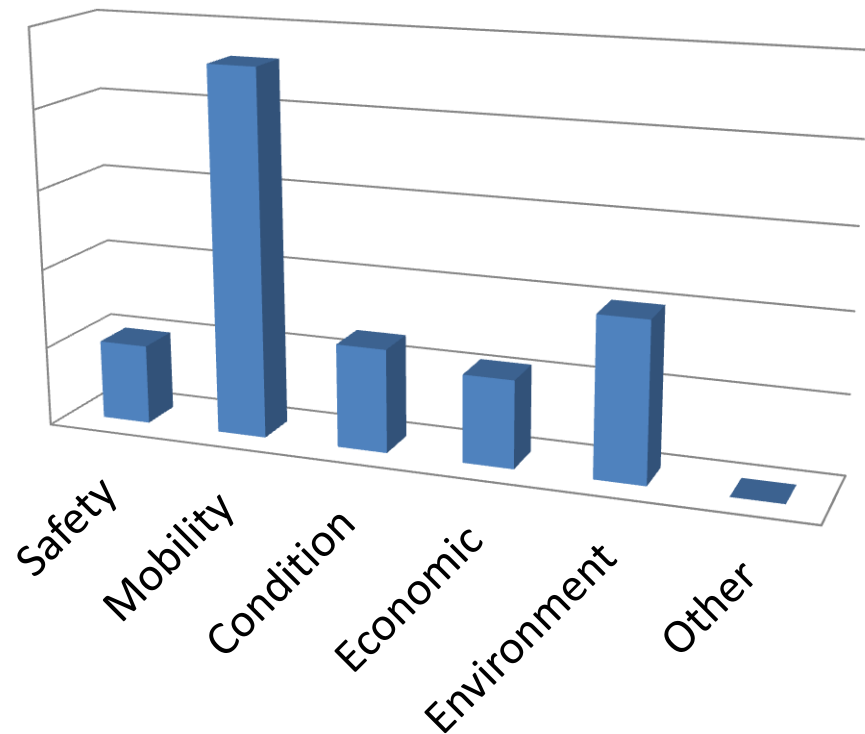


Performance measures produced by models

The most common types of measures forecasted using travel demand models are mobility and environment.

The least common—though also possible to forecast using travel demand models—are safety and economic performance measures.

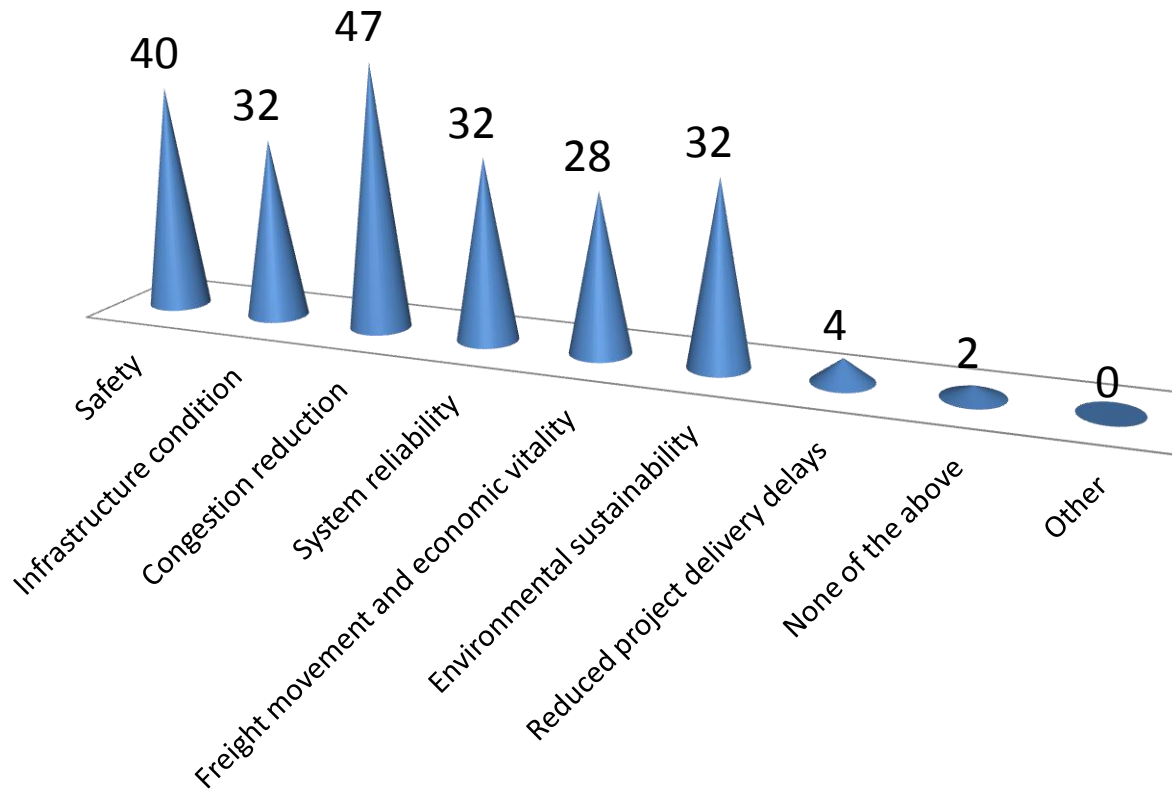
Which categories of transportation system performance measures are forecasted using travel demand models?



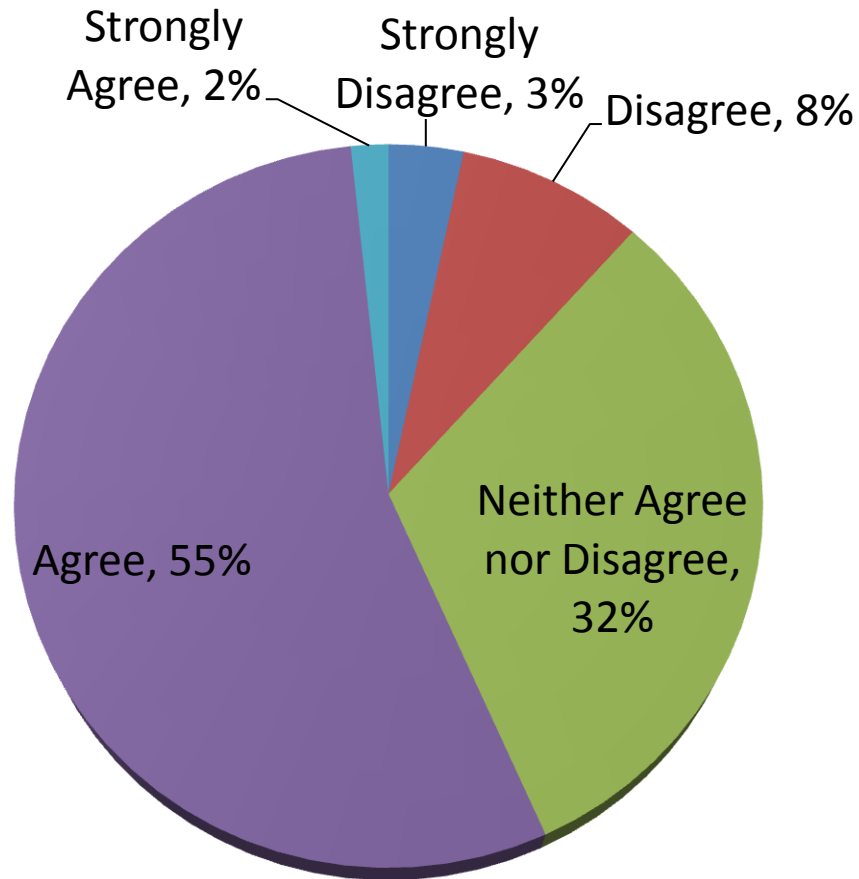
Attitudes towards measures & models

- 42% of respondents said that they felt that their agency's current travel demand model could accurately forecast transportation system performance
- The same percentage said that they felt comfortable sharing performance data produced by their travel demand model with other agencies and the public

Which of the following national performance goals, if any, do you expect to address in your own jurisdiction using transportation and/or land use models?



"An increased emphasis on performance-based planning strengthens the role that models play in defining policy objectives and evaluating future scenarios."



Questions for the Audience

- How many of you used performance measures in the pedestrian and bicycle components of your last long-range transportation plan?
- How many used a model to forecast future pedestrian/bicycle system performance?
- How many evaluated the performance of alternative scenarios with regard to pedestrian/bicycle performance measures?