

Conference on

Innovations in Travel Analysis and Planning

Indianapolis, IN • June 4–6, 2023

Travel Forecasting Uncertainty

Marty Milkovits, Boston Region MPO

Tierra Bills, UCLA

Sarah Sun, FWHA

Rachel Copperman, Cambridge Systematics

Naomi Stein, EBP

Jay Evans, RSG

Greg Macfarlane, Brigham Young University

Tara Weidner, Oregon DOT

Vivek Yadav, Cambridge Systematics

Workshop Structure

- Motivation and proposed approach
 - AEP50 Uncertainty Initiative - Marty Milkovits, Boston Region MPO
- Table setting presentations
 - Transportation Planning for Uncertain Times - Sarah Sun, FHWA
 - Uncertainty Modeling in Practice - Rachel Copperman, Cambridge Systematics
 - Uncertainty in Transportation Planning and Programming - Naomi Stein, EBP
- Breakout discussion and report back
 - Research Needs - Tierra Bills, UCLA

Uncertainty Initiative

Promote a broad understanding of **practical approaches** to effectively inform decision-makers faced with **uncertainty** underpinning baseline assumptions **in travel forecasting and planning**.

- How reasonable is it to produce a single “best-guess” forecast for 25 years hence?
- Our tools and methods need to evolve

Initiative Approach

- Identifying uncertainty areas and ranges
- Exploring uncertainty space with quantitative analysis
- Visualization and analyzing results
- Translating results into useful inputs to the planning process



trbtravelforecasting.org/uncertainty

Identifying uncertainty areas and ranges

What are we uncertain about (and does it matter)?

Potential Contributions:

- Catalog of uncertainty variables and ranges
- Important uncertainties that are not modeled well
- How to define uncertainty bounds and translate into model parameters
- Using updated information to refine uncertainty distributions

Exploring with quantitative analysis

What tools, or types of tools, are useful to explore an uncertainty space?

Potential Contributions:

- Evaluate suitability of a model to test uncertainty
- TMIP-EMAT reference / user's group
- Practice of using strategic tools (e.g. VisionEval) along with more complex travel demand models

Visualization and analyzing results

What visualizations / analysis approaches will help identify the signal of an uncertainty analysis?

Potential Contributions:

- Example visualizations and source code
- Procedures and guidelines for different audiences

Translating results to the planning process

How can we demonstrate the value and feasibility of an uncertainty analysis approach for planning agencies and regulators?

Potential Contributions:

- Examples communicating uncertain forecasts to stakeholders accustomed to point predictions
- Methods to bring together a more diverse set of stakeholders with a wider range of model assumptions
- Where uncertainty can be and is used in the planning process

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Table Setting Presentations

- Transportation Planning for Uncertain Times - Sarah Sun, FHWA
- Uncertainty Modeling in Practice - Rachel Copperman, Cambridge Systematics
- Uncertainty in Transportation Planning and Programming - Naomi Stein, EBP

Research Needs Statements

- TRB has built and maintains an extensive research needs statements (RNS) database for "timely, impartial and evidenced-based information exchange and research." (1)
- A RNS is a "structured description of a research topic that is anticipated to deliver value to practitioners [and researchers]..." (2) It summarizes a research priority identified by a TRB Committee
- RNS are "instrumental to formulate committee's research activities ranging from call for papers, workshops, webinars, and funded research through cooperative research programs" (2)
- AEP50 (TRB Travel Demand Forecasting Committee) will be working to draft research needs statements in June 2023

(1) <https://www.trb.org/main/CallforRNSTransportationAndPandemics.aspx>

(2) <https://www.travelsurveymethods.org/committee-research-activities/>

Breakout Groups – Discussion Questions

- **Where are we now?** State of the practice / references / lessons learned
- **Where could we go next?** Immediate contributions TRB could foster
- **Where do we want to be in 3-5 years?**
Longer term needs for research to promote
- **Does the initiative structure work? Other areas that should be highlighted?**

Workshop Materials



bit.ly/itap_uncertainty

Wrap

Get / Stay Involved: groups.google.com/g/aep50-uncertainty

Next steps for Uncertainty Initiative

- Build connections in community to support uncertainty analysis
- Develop and maintain references for practitioners and researchers
- Motivate research to advance practices

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Thank you!

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