

Forecasting Uncertainty

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Workshop Structure

Uncertainty Initiative Overview

Summary of findings from ITAP Workshop

- **Poll Responses**

Discuss gaps and priorities

- **Breakout to advance priorities**

Uncertainty in Transportation Planning and Programming - Update

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

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

Findings from ITAP Workshop

- **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
- Potential Research Needs Statements

State of the Practice

- Variety of uncertainties of concern (land use, travel, tech, climate)
- Many challenges to incorporating uncertainty (tools, understanding, acceptance)
- Current Practice:
 - Uncertainty is a hot topic, but not a consistent / established practice
 - Strategic planning and models is engaging policy/decision makers
 - Modeling has “lost its shine”
 - Running many scenarios does reveal more of the information from the model

Immediate Contributions

- Definitions, References and Guidelines
- Community building
- Advance new practices
 - Robust decision making
 - Review model forecasting accuracy
 - Mitigate long travel model development process

Longer term research to promote

- Phased project implementation depending on updated information
- Common tool architecture to support uncertainty analysis
- Guidance on addressing uncertainties that are hard to analyze quantitatively

Research Needs Statements

- Examples where incorporating uncertainty has affected decisions
- Restatement of value and purpose of long term travel demand models
- Effective communication around uncertainty
- Record of the state of the practice
- Flexible infrastructure planning



Poll Results