Statewide Needs Assessment for Next-Generation Travel Demand Models

Siva Srinivasan, University of Florida
Abdul Pinjari, University of South Florida

Florida Model Task Force (MTF)
Model Advancement Committee
November 9, 2009

Have we not identified MTF priorities already?

- Our focus is on long-term enhancements (versus the more immediate needs identified by the MTF priorities survey)

- Our focus is on comprehensive re-thinking of the travel-demand model system (versus the component-level improvements required for meeting immediate needs)

Preamble

- This presentation is based on a “scope-development exercise” (not an undergoing project) for long-term, statewide travel demand modeling needs assessment in Florida
- The exercise started around March/April and is in the process of refinement now
- Feedback /inputs to this scope are welcome

Introduction

- FSUTMS
  - Statewide framework for travel demand modeling in Florida
  - Follows the familiar, trip-based, 4-step approach
  - Some regions have modified the standard FSUTMS framework to suit their needs (e.g., lifestyle-based trip generation of Tampa Bay model)
  - Recent MTF survey identified several near-term modeling priorities
- Some regions are moving to (or considering the shift to) more advanced models
  - Tampa Bay moving to tour-based/activity-based model
  - North Florida (Jacksonville)
- Recognition that current model may not adequately serve emerging planning/policy needs

- Some questions of interest while considering “new” models:
  - What are the components of these models?

    - Activity/tour generation instead of trip generation
    - Destination choice instead of gravity models
    - Disaggregate modeling and micro-simulation
    - Highly disaggregate temporal (time-of-day) resolution
    - Intra-household interactions

- Some questions of interest while considering “new” models:
  - Can the desired structure be same for all regions in FL?
  - Can complex models be developed and used in all regions?
    - What are the resource requirements and limitations?
  - How to transition from current practice to new models?
  - What are the tangible benefits?

Why a Needs Assessment?

- To address the issues identified earlier, it is critical to first identify all the reasons for which we want to use the models
- With varying populations, and planning/policy needs and priorities, a single model structure may not suit all regions
- A highly complex model may not be necessary for all regions
- Even to determine the level of complexity , we need to be aware of the specific modeling needs
- Development of a statewide modeling framework akin to FSUTMS (or even assessment of the feasibility of such a statewide framework) needs to be cognizant of statewide modeling needs

Objectives of the Proposed Scope

A. To conduct a thorough assessment of the transportation planning and policy needs and priorities in different regions of Florida

B. To identify requirements of the next-generation travel demand models to address the planning/policy needs in each region of Florida

C. To develop conceptual structure(s) of the next-generation travel demand models to be developed in different regions of Florida

Proposed Scope

A. Conduct a thorough assessment of the planning and policy needs and priorities of different transportation agencies in Florida
   - The near-term needs identified by MTF (CS) survey are relevant
   - A further, detailed understanding of the long-term needs may be helpful
     - What are all the planning/policy needs in near and longer terms
     - What model outputs are expected for each planning/policy application?
     - How detailed (e.g. temporally) should be the outputs?
     - What is the current practice and what are the difficulties experienced?
     - What is the priority of the application needs?
   - A detailed (and prioritized) list of needs will help in:
     - Determining the level of model complexity (or simplicity) for each region
     - Understanding what model features are necessary (or not necessary)
     - Assessing the need for the development of a state-wide standard
     - Laying out a transition plan from current practice to advanced models

Proposed Scope

B. For each identified need, identify the required model components, and desirable modeling aspects.
   - Specifically, for each geographic region, develop a matrix identifying the appropriate model features for each planning/policy need
   - In the matrix, rows represent the needs, and columns represent the modeling aspects/features.

   The modeling features include, for example:
   - Unit of analysis (TAZs, individuals)
   - Prediction method (aggregate methods, micro-simulation)
   - Spatial resolution of model inputs and outputs (TAZ, parcel)
   - Temporal resolution of model inputs and outputs (3-5 time periods, more)
   - Travel representation (trip-based, tour-based, activity-based)
   - Trip purpose resolution (work/non-work, detailed travel purposes)
   - Interpersonal interactions (No, partial, extensive)
   - Traffic assignment (dynamic, static)

Proposed Scope

Example matrix (to be developed for each geographic region)

	Unit of Analysis	Prediction Method	Spatial resolution	Temporal Resolution	Household Interactions
LRTP updates					
TDM strategies					
Toll studies					
HOV/HOT lanes					
.					
.					
.					

Proposed Scope

C. Develop model scope (or conceptual model structure) for different regions in Florida
   - Recommend required model features for different regions in Florida
   - Assess data needs and data availability
     - Can existing Florida data sources be used to develop required models
     - Assess the use of upcoming NHTS data
   - Based on needs, priorities, the model features matrix, and data availability, recommend model scope for each geographical region

Supporting Tasks for Proposed Scope

- Synthesize information on existing travel demand model needs assessments
- Identify travel demand modeling stakeholders to be surveyed/interviewed and prepare survey/interview scripts
- Survey/interview stakeholders from different regions in Florida
- Identify requirements of next-generation travel demand models for different regions in Florida
- Identify data needs, availability, and constraints
- Develop conceptual structure(s) of the next-generation travel demand models to be developed in different regions of Florida

Thank you

Questions/comments/suggestions welcome