A Blueprint for Travel Demand Forecasting in Florida

presented to
Florida Model Task Force

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December 2, 2010

Presentation Outline

- Yesterday, Today and Tomorrow
- Forecasting Needs and Capabilities
- The Plan Forward
Yesterday
What we already know

- Forecasts used for
  - Long Range Plans
  - Corridor Studies – How many lanes?
  - Regional Emissions

- Needs Characterized by
  - Regional Orientation
  - Highway and Vehicle focus
  - Daily Travel
  - Assumption of stable travel behavior

Today
What we are figuring out

- Forecasts needed for
  - Land Use Impacts
  - Transit Demand
  - Reaction to pricing
  - Site development impacts

- Needs Characterized by
  - Smaller Geographies and corridors
  - New modes
  - Need to understand traveler response
Tomorrow
Something to worry about!

- Questions being asked about
  - Dynamic Pricing and Pricing Policy
  - Non-Motorized Travel
  - Induced Travel
  - Traveler response to congestion
  - Freight
  - Temporal shifts
  - New Starts Requirements
  - Regional Land Use/Travel Demand interaction
  - MOVES and Air Quality

Tomorrow
Something to worry about!

- Needs Characterized by:
  - Fundamental travel choice behavior
  - Time-specific effects
  - Driver behavior
  - Macro and micro economic influences over time
Forecasting Needs and Capabilities

- Generally FSUTMS meets yesterday’s needs, and can be used to address today’s needs.
- However, future needs stretch our forecasting needs to the breaking point.

The Plan Forward

- Short term (1-2 years)
  - State of the practice improvements to models
  - Emphasize better practices
- Long term (3-5+ years)
  - Develop an Activity-Based Framework
  - Develop time-dependent assignment routines
  - Continued development in data, validation/calibration and training
Not just better models, better forecasts

How do we achieve this?
- Improved Tools
- Sufficient Data
- Knowledgeable Construction
- Advanced Modelers

Improved Tools
- Short term -- Implement State of the practice elements as standard model design. Some examples:
  - Time of Day stratification for distribution & mode choice
  - “Faithful” transit station coding
  - Appropriate Trip purpose expansion or contraction
  - Feedback through distribution, with closure criteria
Improved Tools -- Continued

- Medium-Long Term
  - Evolutionary development of AB model
  - Truck model → Freight Flows → Commodity Flow model
  - Land use models
  - Time-Specific Assignment (DTA “flavors”)

Sufficient Data

- Transit Survey Standards
  - Survey Instrument
  - Need-based sample size determination
  - Survey Collection Techniques, QA/QC
  - Survey weighting and expansion
  - Survey data processing and examination
Sufficient Data -- Continued

- Other surveys
  - Home Interview – Long range plan for systematic collection
  - NHTS, QEW, AHS
  - Special Generators & Special Events
  - Establishment Surveys

Knowledgeable Construction
Model Calibration and Validation

- Examples
  - Adjusting Mode Specific constants that result in matching observed mode shares \( \text{and} \) represent reasonable equivalent in-vehicle times.
  - Matching district to district flows without
    - Distorting friction factors and average trip lengths
    - Using excessive or arbitrary k-factors or DC utility equation constants
    - Resorting to HUGE district definitions
  - Matching Counts and model estimates without resorting to arbitrary and selective link adjustments
Knowledgeable Construction -- Continued
Model Calibration and Validation

• What is it?
  • Taking an objective and disciplined approach to modeling travel behavior
  • Recognizing problems – and knowing what to do about them
  • Taking advantage of techniques and skills learned the hard way by others
  • Asking “How does this reflect real behavior” of each model parameter.
  • No Guesses, No Excuses
  • Hard Work!

Advanced Modelers

Better models, better construction, better data is of no use if we don’t have better modeling professionals

• It starts with formal training (and willingness!)
• Better modelers require time to practice and learn
• An environment of
  • Cooperation
  • Efficient sharing of knowledge
  • Easy access to experts
Advanced Modelers
How do we build them?

1. Leverage Existing FDOT training
2. Bring training up to state of the practice
3. Set high standards
4. Provide an efficient knowledge-sharing mechanism
5. Provide a way to “ask the expert” – and know who that is!

Next Steps

- Model Task Force Endorsement
- Develop a coordinated model improvement plan, all efforts pulling together in the same direction, fund it.
- Develop a strategy for evolutionary approach to AB and time-sensitive assignment techniques, and begin evaluation → design → implementation process
- Update standards for model design, construction and validation/calibration.
- Update training course materials, and develop formal support and modeler communication services
Conclusion

- This isn’t the conclusion, it’s the start
- Models are tools
- Forecasts are the results
- New features must be need-based
- Everyone pulls together