New Mexico Statewide Model

Fifth Largest State in land area

2005 Population 1.97 million

42% of state in Albuquerque and Santa Fe area

Outside urban areas population density very low
New Mexico Planning Areas and Major Initiatives

Five MPOs; four in state; one in El Paso

Seven Regional Planning Organizations

Statewide Long Range Multimodal Transportation Plan adopted in 2006

Freight Study, Final Draft August 2008

Tolling Feasibility Study, May 2008

Statewide Model, November 2008
Factors Leading to Model

- 2006 Adoption of State Long Range Multimodal Transportation Plan
  - Heavy emphasis on federal planning factors and DOT Guiding principles
  - Technical analysis; high on the supply side, not much on demand side

- Strategic Multimodal Plan, Phase I, Cambridge Systematics
  - Identified usage and needs for rural transit, intercity transit
  - Identify performance measures to Identify and Prioritize multimodal transportation projects
Strategic Multimodal Plan, Phase I

1. Base and Future estimates of travel and needs
2. Vehicle Miles of travel forecasts
3. Base and Future socioeconomic data (population and employment estimates)

- Statewide Model options
Purpose of Model

- Consistent tool and data to support statewide policy and planning for freight, tolling, long-range planning
- Intercity Transportation Projects
- Emphasis on Performance Measures
- Freight Planning
- Congestion Pricing
- Augment External trip making estimates for MPO models
Model Options Explored

- Demand Estimation and Link Factoring
- Simple Network Model
- Basic Four Step Model
- Integrated Freight and Passenger Four Step Model
- Innovative Modeling Techniques
- Software Packages
Approach

- Core Model – Simple network model for cars and freight
- User Interface – To share data with regional models, other tools, and to produce useful outputs
- Model expansions – Allow for easy system refinement and expansion as the agency’s future needs evolve
- Microsimulation and Sketch Planning Tools – Link with tools for detailed corridor operational analysis
- Develop Common Database – For planning elements such as freight, traffic counts, socio-economic data
New Mexico Statewide Model Structure

- Web-Based Reporting
- NMDOT GIS Networks
- Regional Travel Models
- Socio-economic Data
- User Interface
- Core Model Simple Network/ODME for Passenger Travel
- Sketch Planning Tools
- Rural Transit (from Multimodal Study)
- Intercity Rail
- Model Expansions
- Freight Model Based on TRANSEARCH Data
- Economic Analysis (REMI, HERS-ST)
- Potential Future Model Components

Socio-economic Data

Freight Model Based on TRANSEARCH Data
Core Model

- Simple network modeling system for cars and trucks
- Transportation networks
  - Available information-GIS
  - Intercity and highway emphasis
  - VISUM software
- Transportation analysis zones Available data from Phase I
  - NMDOT sources and links (GIS, REMI, others)
  - Nested data from regional models
  - Commodity-flow data
  - Federal Sources
  - UNM BBER
Data Compilation - Networks

- Calibrated roadway network
  - State routes of regional significance
  - Additional regional routes in MPO areas

- Roadway network attributes
  - Alignments
  - Posted speeds
  - Count data
  - Area type
  - Physical attributes for defining capacity

- Data linked between Model and GIS by roadway ID and begin/end milepost
Traffic Analysis Zones

- Traffic analysis zones (TAZ)
  - Passenger trip originating and destination points
  - Used to develop seed table to the origin-destination matrix estimation process

- TAZ geography
  - TAZ based on Census block groups
  - TAZ relatively uniform and consistent with network
  - Average 3,000 population
MPO TAZ Compression

Existing MPO TAZ (380)

Las Cruces MPO to Statewide

Statewide Aggregated TAZ (122)
Count Data

Average Annual Daily Traffic

- Volumes greatest in urban areas
- Other higher volumes point to through trips. Possibly freight
- Model will capture rural trips
Freight Component Summary

- Emphasis on freight in parallel with the Multimodal Freight Study
- Through freight movements
  - Base year through freight trucks from FAF2
  - 2035 through freight trucks from FAF2
- Internal, internal to external and external to internal freight movements
  - Estimated at the county level
  - Will be further disaggregated to the sub-county/TAZ
Freight Component (FAF) – 2002
Model Procedures

- **Passenger Model**
  - Origin-Destination matrix estimation
    - Traffic count data
    - Seed table estimated from NCHRP 365 procedures

- **Freight Model**
  - Freight Analysis Framework (FAF) to identify flows
User Interface

- Simple user interface with features to be determined
  - Integrated with VISUM
  - Data export and import functions and integration with sketch planning tools and databases
  - Performance measures and travel demand outputs to support
    - Corridor analysis (congestion relief, alternatives analysis, toll)
    - Statewide studies (LRTP, highway, finance, economic)
    - Regional system studies (freight, congestion relief, toll)
    - Technical tools and analysis (microsimulation, operations, toll feasibility, multimodal analysis)
Model Expansion/Maintenance

- First generation; flexible, modular structure
- Model components independent of one another
- Refinement and replacement of modeling components
  - Agency needs
  - Availability of resources
- Optional expansion features
  - Regional model TAZ nests
  - Proprietary freight data to support core model
  - Conversion to traditional 4-step travel modeling process
Microsim, Databases, and Sketch Planning

- Design plan for post-processor, sketch planning tool development
  - VISSIM microsimulation
  - Transportation system performance
  - Economic and benefit/cost
  - Freight
  - Toll diversion
  - Operations (IDAS)

- Develop interfaces for each tool
Schedule

- **Core Model Development**
  - November 2008 (14 months from notice to proceed)

- **User Interface**
  - Core model operation – November 2008-Interim Training
  - Microsimulation, databases, post processors (draft) – May 2009

- **Model Expansion - November 2008**

- **Microsimulation, Databases and Sketch Planning Tools**
  - August 2009

- **Training – September 2009**
Study Team

- **NMDOT Planning Division**
- **Cambridge Systematics**
  - Travel modeling specialists
  - Lead all phases of the project
- **Alliance Transportation Group**
  - Support Task 2 (passenger car modeling)