Florida Model Task Force

GIS Committee

Model Information Exchange System - MIXS
Introduction to MIXS

Model Information eXchange System (MIXS) is a mechanism by which transportation modeling and related data from diverse sources and databases are seamlessly linked.

- Integrate data from various Databases
  - *Work Program, RCI, FSUTMS, SIS, FGDL, ETDM*
- Facilitate Data Exchange
- Build Common Information Exchange System for Data Sharing
Vision

- Link data from various sources seamlessly

Initial goal
- Serve data needs of FSUTMS

Final vision
- Let Modelers search and extract data without worrying about source data structure and compatibility
- Use web based interfaces for fast easy access of sharable / current data
Challenges

- Data exchange and sharing between diverse data models and reference networks
- Continuous maintenance and updating within the databases
  - data elements (variables) and network features
Information Flow in Transportation Planning

Input Data
- Transportation Modeling
- RCI Data
- WPA Data

MPO/FDOT process
- Need Plans
- LRTP/SIS Plan

FDOT system
- ETDM
- WPA
- TIP
Data Connectivity Problems

- Data discrepancy among street reference data at different levels of transportation planning (MPO mobility planning, FDOT work program)
- No database tracking mechanism of transportation projects reference and attribute data during different phases of transportation planning.
- No data structure to handle multimodal transportation data
- No documented method to connect socio-economic databases to a larger transportation database framework.
Discrepancy among major street reference data

RCI intersections and local streets

Relationships between local data and Unified Basemap

Relationships between Unified Basemap and RCI
Development Approaches

- Develop a common Data Model based on a ‘Network Location Model’ and ‘Event Tables’

- Two basic approaches:
  - Exchange system
  - Conversion system
Exchange system:

- Developing a standard data model (Navteq for potential use)

- State maintained roads based on the TSO base map Roadway

- Databases internal to FDOT and other local government data could also be linked to the same linear referencing system

- The “Information Technology – Geographic Information Framework Data Content Standard,” originally called Geospatial One Stop Data Content Standard could be incorporated

- Integrate ‘Geographic Information Framework Data Content Standard’ Data Model developed by FHWA

- Demonstrate early success by manually extracting and assembling the database

- Pilot study using local Government Agencies
unified statewide transportation data model

- State Data (InfoUSA, FGDL, BEBR, CTPP)
- Multimodal transportation data
  - WPA, ETDM
  - RCI Basemap

MIXS

Local Databases
- Local Spatial Data
- Local Attribute Data

Unified statewide network database (e.g. Navteq)
Unified statewide transportation Database for DOT

Event table for Safety model

Event Layer of Safety model

Event model
Exchange system:

- **Advantage:**
  - Local governmental agencies can maintain and update their data as they usually do.

- **Disadvantage:**
  - If the original network data and/or data model is different, a data model conversion or database linkage tool is still needed to link the data models used in different databases, based on a common and standard data model.
Conversion system

- Requires the development of a conversion tool
Conversion system

- **Advantage:**
  - Future updates and maintenance will be easy

- **Disadvantage:**
  - Effort required for the initial conversion may be time-consuming
  - Some of the special features in the original database may be cumbersome to be included in the new data model
  - Some local agencies may not want to convert their data unless are provided with financial and technical support
Development Process

PHASE I - Research

1. Develop a Unified Transportation Data Model for FSUTMS
2. Develop a conceptual model of MIXS
3. Conduct Feasibility Study using a pilot study area

PHASE II - Implementation

• Develop software tools and procedures to support automation of the system
Incentives to adopt MIXS

- Common Modeling Framework - Metadata
- Easy data sharing via web interfaces
- Better Central Office support
- Standard based tools
  - LOS Calculator
  - FSUTMS Reporting Tool
  - FSUTMS Scenario manager – Data Framework
  - ITS Reporting Tool
  - Air Quality Modeling
Phase I – Scope of Work and Timeline

1. Develop a Unified Transportation Data Model for FSUTMS
2. Develop a conceptual model of MIXS
3. Conduct Feasibility Study using a pilot study area
4. Develop required specifications for Phase II

Total Duration Phase I – 18 months