



Florida Model Task Force

GIS Committee

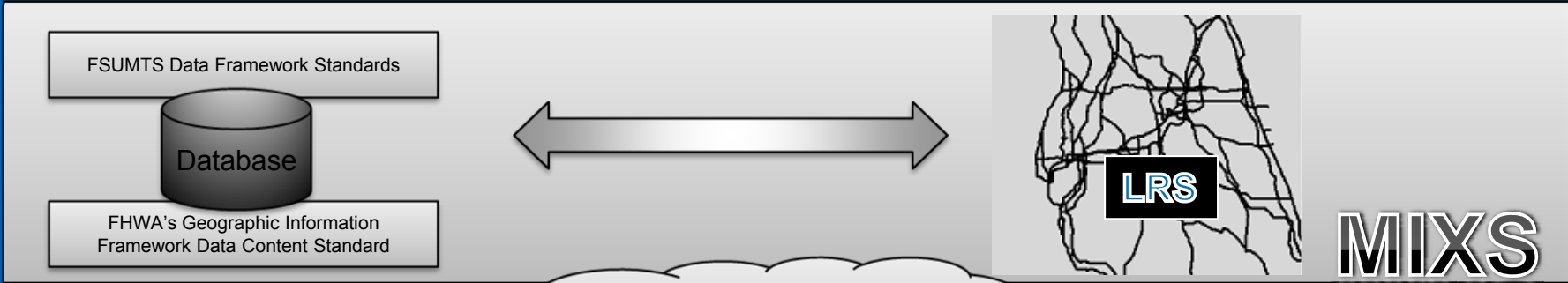
Model Information Exchange System - MIXS





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

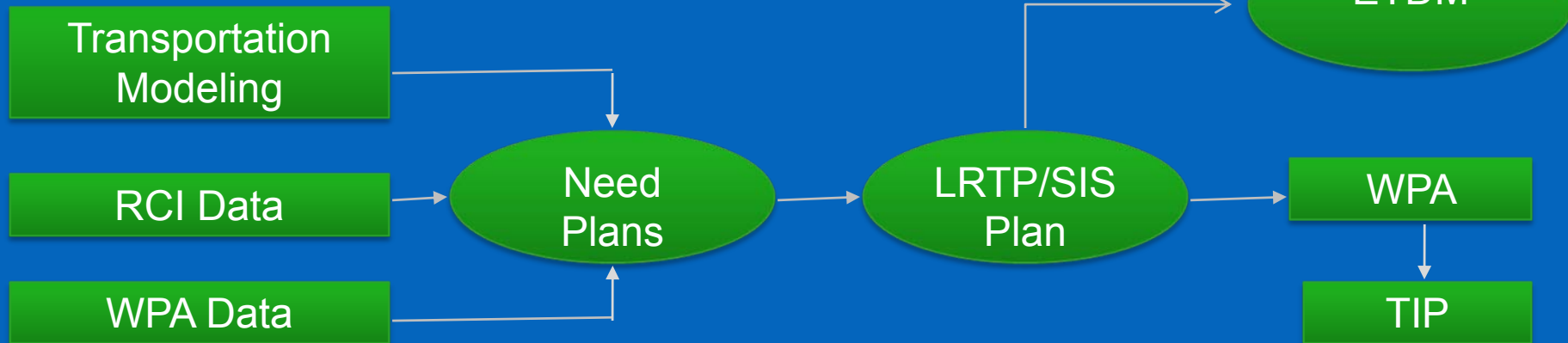


Information Flow in Transportation Planning

Input Data

MPO/FDOT process

FDOT system





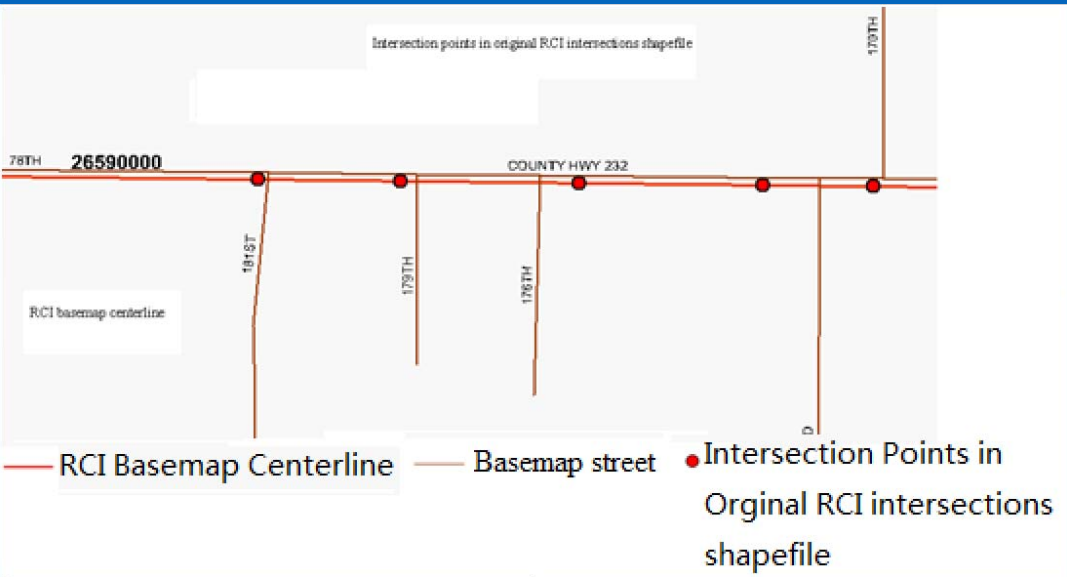
Data Connectivity Problems

- 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.





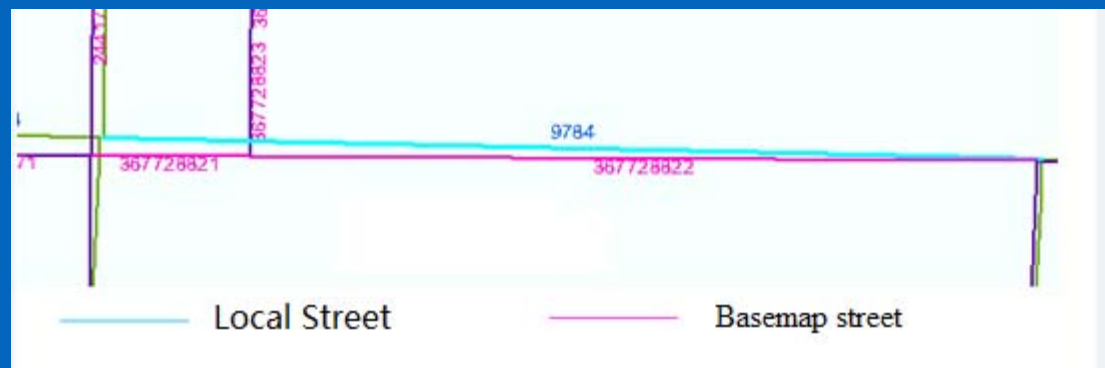
Discrepancy among major street reference data



Selected Attributes of GeoGDT_SegmHNETGDT_LrRCI

OBJECTID	SHAPE*	SHAPE_Leng	GDTID	Roadway	StartPostInRCI	EndPostInRCI
11	Polyline M	577.211454	422517801	26549000	<Null>	<Null>
12	Polyline M	195.263893	422517799	26549000	<Null>	<Null>
13	Polyline M	2047.432149	422517807	26549000	<Null>	<Null>

RCI intersections and local streets



Relationships between Unified Basemap and RCI

Relationships between local data and Unified Basemap





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





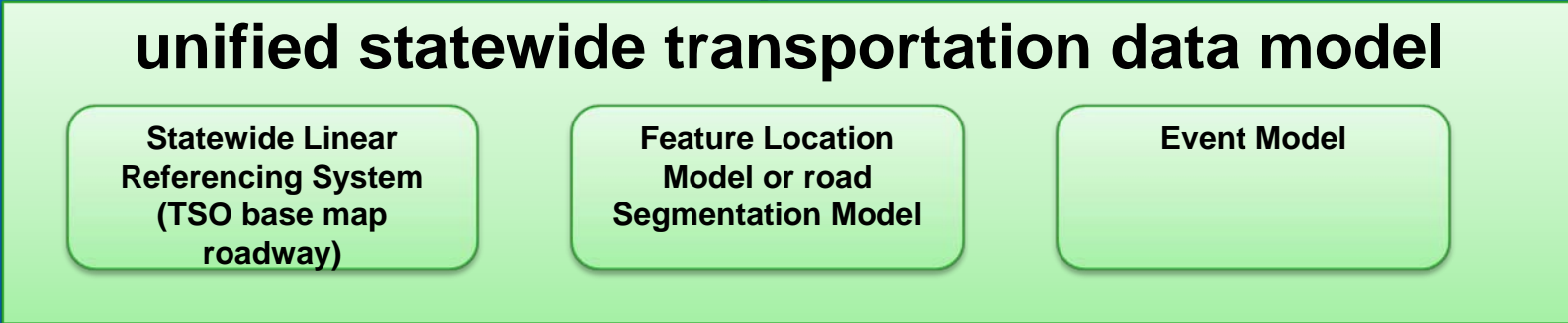
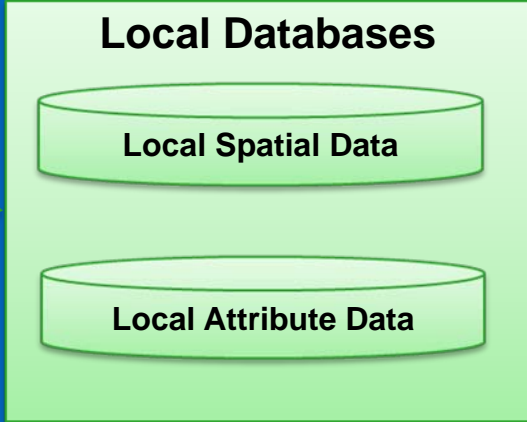
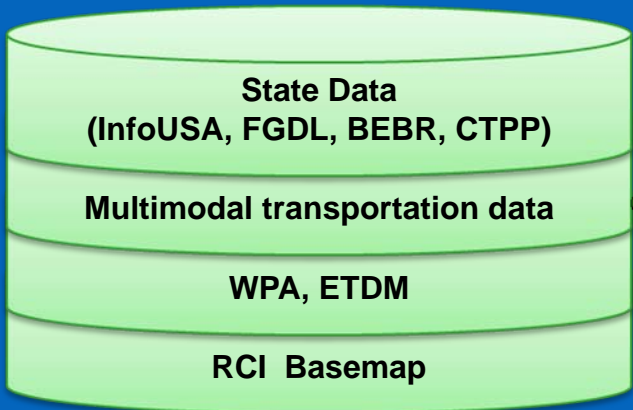
Safety

Transportation demand model

Future land use model

Air Quality

Others

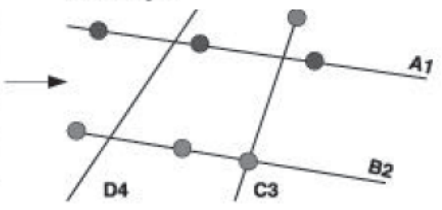




RID	MILE	
A1	0.2	1
A1	1.1	2
A1	2.0	3
B2	0	1
B2	1.3	2
B2	1.9	3
C3	2.1	1

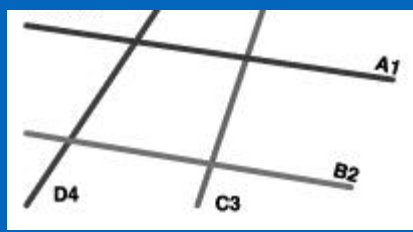
Event model

RID	MILE	STOP	Stop
A1	0.2	1	Point M
A1	1.1	2	Point M
A1	2.0	3	Point M
B2	0	1	Point M
B2	1.3	2	Point M
B2	1.9	3	Point M
C3	2.1	1	Point M



Event Layer of Safety model

Event table for Safety model



Unified statewide transportation Database for DOT



Exchange system:

- **Advantage:**

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

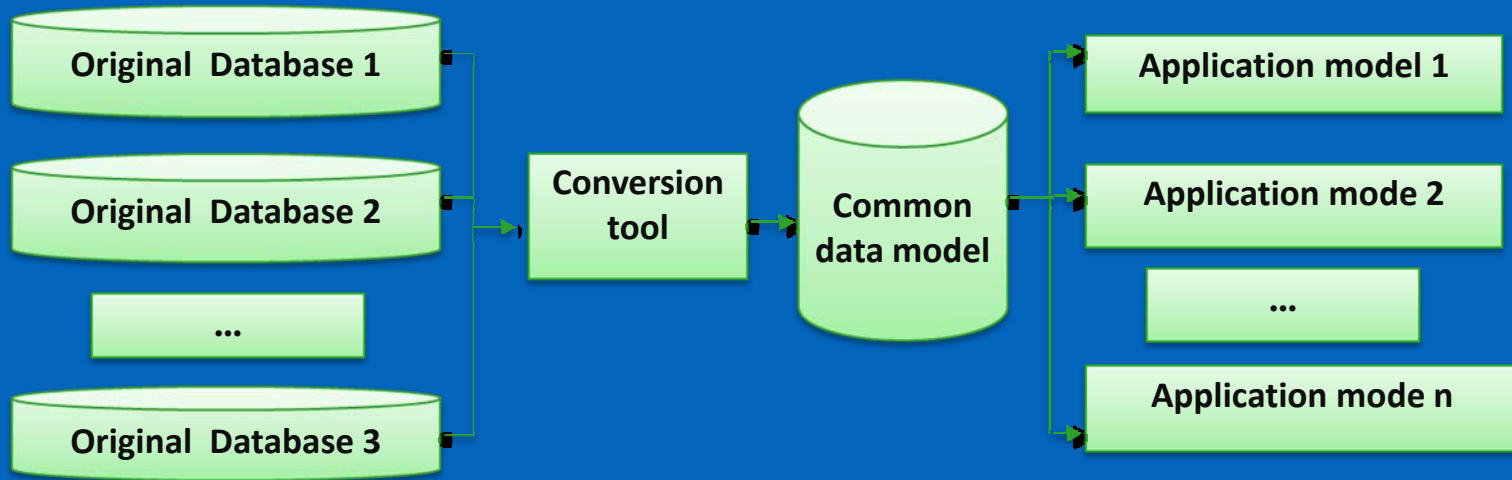
- **Disadvantage:**

- 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