Spatial Information Technologies for Asset Management: A Peer Exchange

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Why Spatial Technologies are Important to Asset Management

- Integration - Data
- Visualization – Decision Makers
- Spatial Data Warehouse – Data Analysis, History
**Purpose of the Peer Exchange**

- Share experiences on successful applications of spatial information technologies for Asset Management
- 5 Agency Participants
- TRB Electronic Circular
Facilitators

- Sponsor - US DOT – BTS/RITA
- Transportation Research Board
- Leader – Sue McNeil, Chair, TRB Asset Management Committee
Participating Agencies

- Alaska DOT and Public Facilities
- City of Edmonton
- Kansas DOT
- New York State DOT and State Thruway Authority
- North Carolina DOT
Characteristic of Agencies

- Enthusiastic and Proactive
- High Resource Allocation
- Higher Level Decision Support
- Broad View of Assets
- Questionnaire and Presentation
**Benefits**

- Visualization for staff, managers, legislature
- Enterprise integration of data – asset/modes
  Complex analysis of data for decisions – e.g. program development
- Sophisticated analysis – e.g. travel flow
- Incorporation of external data e.g. MPO
- Intranet/Extranet/Internet delivery
- E-government capabilities – public participation
Edmonton - Physical Condition of Assets
Existing Situation

- Multiple software platforms
- Wide variety of legacy systems
- Integration problems
- Multiple linear referencing methods
- Data Stewardship issues - quality, timeliness, accuracy problems - metadata
- Problems in integrating more precise information
- More details in data e.g. specific bridge spans
- Historical data not typically spatially enabled
Spatial Layers with Displayed Milepost Breaks
Example

Planning zone

Div. 6 Treatment Data

PMU Road Condition Data

GIS ROADCONDITION Layer
Updated GIS ROADCONDITION Layer

PMU Road Condition Data

Planning zone

Div. 6 Treatment Data
Significant Issues

- Enterprise Implementation - Technical Issues
- Enterprise Implementation – Organizational Issues
- Field data collection - Expensive
- Updating/validating road centerline
- Integrating databases internal and external – different identifiers, timeframes, precisions
- Limited established transportation models for analysis
- Training and cultural issues of users, managers
- Lack of consistent internal standards vs. flexibility
- Fit with external GIS efforts – federal, state, local
Successful Products – Current

- Web based queries – internal managers and districts
- Static decision maps – public use, data verification
- Dynamic decision making products – answer what if questions, just starting
Projected Future Products – With the Greatest Benefits

- Automated data collection and processing
- Data integration/conflation tools
- More sophisticated web-enabled analysis tools
- Road centerline – verification, accuracy
- Economic analysis tradeoff models
- More integration with non-transportation assets
- Improved query products for use by non-computer savvy managers, including mobile access
- Enterprise implementation
Kansas 3-D Model Samples
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Roles/Actions of National Organizations

- Share best practices – case studies, documentation, exchanges, website
- Promote open data architecture
- Finalize NSDI efforts, Transportation Data Content Standard
- Upgrade national data sources - better standards
- Develop transportation models
- Educate Asset Managers of capabilities
Key Issues

- Managing Change
- Integration
- Communication
Managing Change

- Herding cats
- Separate process from personalities
- Top management vision – organization buy in
- Practical solutions – high benefit focus
Integration

- Integrate everything? – prioritize
- How to address temporal issues
- Inhibitors – magnitude time/resources/turf
- Key - Integration with financial/program development/safety systems
- External environment
- Legal implications
GEOMETRY
Interim updates using NYSDOT Highway Construction Contracts
Communication

- Need common language – understanding
- Identify audience
- 2 way street – needs assessment
- Education/training
Major Research Areas

- Symbology – event representation internal/external
- Temporal Issues/Structures – past, present, future
- Data Modeling best practices - Integration