Arkansas Department of Transportation

Safety and Mobility Data Business Plan


May 16, 2018
Agenda

- Purpose – what we did for ARDOT
- Why Data Business Planning?
- Data Business Plan Development
- Assessment of Current State
- Data Governance
- Risks and Impacts
- Improvement Plan
- Next Steps
Other National DBPs – Pilots Supported by FHWA

- **FHWA Office of Operations – Mobility DBP**
  - 3 Pilots
    - Hillsborough MPO
    - Mid-America Regional Council (MARC)
    - Maryland SHA

- **FHWA Office of Safety – Safety DBP**
  - 2 Pilots
    - Washington DOT
    - Kansas DOT

- Arkansas is the first state to conduct both
  - Mobility DBP
  - Safety DBP
Purpose of Data Business Plan
The purpose of the safety and mobility DBP is to:

» develop a plan for ARDOT to meet current and future business needs for safety and mobility data,

» comply with state and federal requirements, and

» improvements to the entire data stream – agency transparency and excellence by organizing, collaborating, collecting, analyzing, and reporting safety and mobility data.

A Data Business Plan (DBP) guides an agency in data management practices:

» A plan for efficient use of people, processes, and technology

» Links business objectives, programs, and processes to data systems, services, and products
Benefits of Data Business Plan – Why Do it?

- Promotes understanding:
  - What data is being collected
  - How the data supports planning, operations & performance measure activities
  - Who is responsible for managing/updating the data

- Identifies duplicative data collection efforts

- Solidify working relationships by identifying how partner agencies share and exchange mobility data

- Lead to more rapid, targeted data acquisitions and reduced costs

- Precursor effort to eventual system and tool development
  - “Greases the skids” for system requirements that will have to be done
Data Business Plan – Challenges

**Technical**
- Data integration
- Data sources
- Tools & technology

**Institutional**
- Costs
- Roles and responsibilities
- Data governance
Why Did ARDOT Develop this DBP Specifically?

- To address challenges in meeting Federal requirements
  - Lack of enterprise-wide data governance and management structure
  - Serious and fatal injury data inconsistencies and accessibility of data
  - Meeting the safety performance targets
  - Ability to collect the Model Inventory of Roadway Elements (MIRE) Fundamental Data Elements
  - Upgrade mobility-related data
Data Business Plan Development
Work Tasks

A. Develop Project Management Plan
B. Plan for Data Management and Governance
C. Assess Current State
D. Conduct Gap Assessment
E. Develop Improvement Plan
F. Establish a Data Management and Governance Program
G. Identify Need for New or Improved Tools
H. Develop Data Business Plan
I. Implement Data Business Plan
Vision and Mission

Vision
» ARDOT’s data management and governance processes are well implemented and documented, performance is measured, and partnerships with other agencies are well aligned

Mission
» Develop an actionable roadmap for improving data governance at an enterprise level and enhancing the business decision-making process through the availability of a high quality, reliable, and timely data and information that is easily accessed, shared, and integrated.
Goals and Objectives for the Safety and Mobility DBP

Goal #1: Implement formal governance framework
- Standards for data collection & maintenance
- Governance roles & responsibilities
- Data Governance Manual
- Actionable roadmap

Goal #2: Improve knowledge base for data
- Knowledge Management System
- Training & education

Goal #3: Deploy resources to meet data system needs
- Data Catalog
- Data access
- Review/approval process for data development requests
Assessment of Current State
Scope of Safety and Mobility Data

Safety Data includes the following on all public roads:
- Crash
- Roadway and
- Traffic data

Mobility Data includes data that measures the nature and extent of travel for the following modes:
- Auto
- Freight
- Bicycle/pedestrian and
- Transit

Some overlap exists!
Key ARDOT Safety and Mobility Data Systems

- Arkansas Uniform Traffic Electronic Crash Reporting System (eCrash)
- Roadway Inventory System
- Traffic Information Database (volumes, vehicle classification, truck weights)
- Ancillary databases – GIS, Linear Referencing System
Data at ARDOT

Staff from the following Divisions

Data from the following Divisions

use
Data Management Maturity Model

**Unaware**
- No activities or improvements in technology, business processes, collaboration, culture, or organization
- Ad hoc activities and relationships
- Efforts are champion-driven
- Limited accountability
- Training staff

**Initial**
- Developing processes for data management and governance
- Performance is measured
- Organization and partners are aligned
- Training staff
- Program is budgeted

**Managed**
- Processes Documented
- Performance is measured
- Organization and partners are aligned
- Program is budgeted

**Integrated**
- Processes Documented
- Performance is measured
- Organization and partners are aligned
- Program is budgeted

**Optimized**
- Improvements are Performance-based
- There is a formal Data Governance Program
- There are formal partnerships
Capability Assessment Results – Safety Data

### Safety Data Collection & Technical Standards
- Completeness
- Timeliness
- Accuracy
- Uniformity / Consistency

### Safety Data Analysis Tools and Uses
- Network Screening (Data)
- Network Screening (Method)
- Network Screening (Coverage)
- Diagnosis
- Countermeasure Selection
- Evaluation
- Accessibility

### Safety Data Management & Governance
- People
- Policies
- Technology

### Safety Data Interoperability & Expandability
- Interoperability
- Expandability
- Integration

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**KEY**
- **Current Level**
- **No Gap**
- **Small Gap**
- **Large Gap**
Capability Assessment Results – Mobility Data

<table>
<thead>
<tr>
<th>Mobility Data Collection &amp; Technical Standard</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Mobility Data Analysis Tools and Uses</td>
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**KEY**

<table>
<thead>
<tr>
<th>Current Level</th>
<th>Desired Level</th>
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<tr>
<td>Current</td>
<td>No Gap</td>
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<tr>
<td></td>
<td>Small Gap</td>
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<td></td>
<td>Large Gap</td>
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Definitions

**Data Management**
- Development, execution and oversight of architectures, policies, practices, and procedures to manage the information life-cycle needs of an enterprise in an effective manner as it pertains to data collection, storage, security, data inventory, analysis, quality control, reporting, and visualization.

**Data Governance**
- Execution and enforcement of authority over the management of data assets and the performance of data functions.
- “Rules of Engagement” for changes, enhancements, increased sharing, etc.
Current ARDOT Governance Initiatives

Data Governance Committee established May 2017. Responsibilities:

» Identifying data gaps
» Identify challenges with data creation, management, analysis, accessibility
» Research options for agency-wide Enterprise Data System
» Identify needs for standardization
» Research data viewing platforms
» Identify hardware, software, & resource needs

Governance recommendations: high level

» Adopt core data principles
» Leverage current Data Governance Committee and expand to enterprise level
» Form additional technical working groups
» Formalize roles & responsibilities
Governance Recommendations -- Specifics

- Adopt data management practices
- Conduct annual assessment of capability maturity
- Develop governance documentation
  - Data Governance Charter
  - Data Governance Playbook
  - Data Catalog
  - Business Terms Glossary
Proposed Data Governance Model

Enterprise Data Governance Committee

Deputy Director & Chief Operating Officer

System Inf. & Research
Trans. Planning & Policy
Maintenance
Fiscal Services

Computer Service
Enterprise-wide GIS
Program Management
Surveys

Bridge
Right of Way
Construction
Materials

Key Division Heads

Data Governance Liaison

Issues & Recommendations

Policies, Procedures & Guidance

Technical Working Group - Safety
Technical Working Group – Infrastructure Condition & Asset Maintenance
Technical Working Group - Reliability and Air Quality
Technical Working Group – Enterprise-wide GIS
Technical Working Group – Others TBD

Business Owners
System Owners
Business Owners
System Owners
Business Owners
System Owners
Business Owners
System Owners
Business Owners
System Owners
Data Program Risks & Impacts
Risk Assessment

- Critical element of Safety and Mobility Data Business Plan
- Identify potential risks involved in safety and mobility data and what can be done to address them
- Cause-and-effect statements to allow examination of
  - the potential that it *could* happen (its likelihood) and
  - its *impact* if it does (its consequences), which helps to prioritize risks

<table>
<thead>
<tr>
<th>Area</th>
<th>Risk Statement</th>
<th>Negative Impact</th>
<th>Likelihood</th>
<th>Consequences</th>
<th>Mitigation Strategies</th>
<th>Priority</th>
</tr>
</thead>
</table>

- Risk assessment results used to prioritize action items
# Example Safety Data Program Risks

<table>
<thead>
<tr>
<th>Risk Statement</th>
<th>Negative Impact</th>
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</thead>
<tbody>
<tr>
<td>If safety data is not integrated with asset data, then…</td>
<td>Roadway geometrics would not align to eCrash data. Manual effort would be required to integrate data, which would impact ARDOT’s ability to conduct robust analysis and network screening.</td>
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<tr>
<td>If all law enforcement agencies do not report crashes using eCrash, then…</td>
<td>There would be large gaps in crash data, delayed availability of the crash database, and reduced accuracy of crash data.</td>
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<tr>
<td>If ARDOT does not develop a centralized data governance structure, then…</td>
<td>Data used for safety analysis would be impacted. It increases the chances of duplicative efforts.</td>
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<td>If ARDOT does not break down the “silo” structure for data, then…</td>
<td>ARDOT projects could be developed using outdated, incorrect, or static data. A persistent gaps could delay project delivery.</td>
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## Example Mobility Data Program Risks

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<th>Negative Impact</th>
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<tr>
<td>If ARDOT does not address gaps in multimodal data, then…</td>
<td>Can’t conduct comprehensive multimodal analysis.</td>
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<td>Public image suffers and lose credibility.</td>
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<tr>
<td>If mobility data is not readily accessible within ARDOT, then…</td>
<td>There would be inefficiencies, and staff who have access will get overburdened.</td>
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<tr>
<td>If ARDOT does not use robust analysis tools to analyze big datasets such as NPMRDS, then…</td>
<td>Data processing would be a manual process, which will limit data being turned into useful information in a timely manner.</td>
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<td>If ARDOT provide funding for improved data collection, then…</td>
<td>Project decisions would be based on limited data, and the review process would lengthen and be more work for everyone.</td>
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Improvement Plan
Improvement Plan

Specific actions related to:

» System Improvements – recommended improvements related to data collection, access, interoperability, quality of data, storage and documentation

» Technology Improvements – recommended improvements related to data tools, database design, system improvements and system interface

» Institutional Improvements – recommended improvements related to data management and governance, ownership, coordination, knowledge management, training and resource availability

» Example: “Continue efforts to collect all MIRE Fundamental Data Elements for all public roads”

Roles and responsibilities assigned so that the actions can be carried out
Implementation Plan: After the DBP

<table>
<thead>
<tr>
<th>Task</th>
<th>6 months</th>
<th>1 year</th>
<th>1.5 years</th>
<th>2 years</th>
<th>2.5 years</th>
<th>3 years</th>
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<tbody>
<tr>
<td>1. Examine and revise agency policies</td>
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<td>2. Implement data governance program</td>
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<tr>
<td>3. Implement actions to improve safety and mobility data</td>
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<td>4. Initiate training</td>
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<td>5. Implement performance measures to traffic success</td>
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Annual Assessment
Questions
Contact Information

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