Why Data Business Planning?
Overview FHWA Data Business Plan Guides
Pilot States and Regions
Why does this matter to you?
Why Data Business Planning?

- MAP-21/FAST
- ACT
- Performance Measures
- Big Data/IoT
- Interoperability
- Data Sources
- Probe Data
- Integration
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
Why is a DBP Important?

- Process of developing a DBP is equally important as the outcome.
- Helps managers and technical staff collaborate.
- Uses business area data & information to support enterprise.
- Promotes collaboration with IT staff.
- Links employee’s responsibilities to the agency’s mission and goals.
FHWA Office of Operations Data Business Plan Draft Guide

Help State DOT and local agency staff charged with mobility data-related responsibilities develop, implement, and maintain a tailored data business plan for roadway travel mobility data.

- Systematic instructions - stakeholder outreach, data assessment and improvement plan, data governance processes and documents, and data management practices.
Roadway Travel Mobility Data

- INCLUDES - vehicle volume, speed, and lane occupancy data, connected vehicle data
- MODES - vehicle, truck freight, bicycle/pedestrian, and transit
- EXAMPLES - vehicle location, presence and speed within the system, transit (location, speed and status data, passenger counts, and schedule adherence), Freight

Source: U.S. DOT Roadway Transportation Data Business Plan, FHWA-JPO-13-084, January 2013
Guide for State DOT Safety Data Business Planning

- Provide practical instructions for State DOTs to follow when establishing a Safety Data Business Plan (DBP)
- Result in improved management and governance of safety data to support decision-making

**Safety Data** = Crash, Roadway, Traffic, and Railway-Highway Grade Crossing Data
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.
Definitions

Data Governance

- Execution and enforcement of **authority** over the management of data assets and the performance of data functions
Guide Steps
Mobility Guide Steps

1. Stakeholder Outreach
2. Data Assessment
3. Gap Assessment
4. Improvement Plan
5. Data Governance Processes and Documents
6. Data Management Practices
7. Develop Data Business Plan
Stakeholder Outreach

- Identify internal and external stakeholders
  - Anyone who collects, owns, maintains, uses, interfaces with, accesses, or benefits from roadway travel mobility data
- Develop registry
- Develop outreach plan
  - Stakeholder involvement
  - Desired feedback
  - Engagement mechanisms (meetings, focus groups, surveys, etc.)
Identify and Document Stakeholders

Core Stakeholders
Champions for the DBP effort

Internal Stakeholders
Traffic operations, traffic safety, roadway design, pavement design, maintenance, air quality, modal, connected vehicles

External Stakeholders
FHWA, State and local agencies, metropolitan planning organizations, transit agencies, traffic management centers, corridor coalitions, freight operators, private data providers, neighboring States, media providers
Step 2
Data Assessment

 Identify issues, symptoms, and root causes to be addressed in the DBP

- Data collection, management, and technical standards
- Data interoperability and expandability
- Data storage and access
- Technology and tools
- Data governance
- Culture
- Collaboration
Assess current level of maturity in each area using the Data Management Maturity Model.

<table>
<thead>
<tr>
<th>Level</th>
<th>Initial</th>
<th>Managed</th>
<th>Integrated</th>
<th>Optimized</th>
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<tbody>
<tr>
<td>Unaware</td>
<td>Ad hoc activities and relationships</td>
<td>Developing processes for data management and governance</td>
<td>Processes documented</td>
<td>Improvements are Performance-based</td>
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<tr>
<td></td>
<td>Efforts are champion-driven</td>
<td>Limited accountability</td>
<td>Performance is measured</td>
<td>There is a formal Data Governance Program</td>
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<td>Training staff</td>
<td>Organization and partners are aligned</td>
<td>There are formal partnerships</td>
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<td>Program is budgeted</td>
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Develop Data Inventory

Increase knowledge of current and future mobility data collection activities in the region

<table>
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<tr>
<th>Agency</th>
<th>Mobility Data</th>
<th>Data Source</th>
<th>Data Collection Method</th>
<th>Network Type</th>
<th>Geographic Boundary</th>
<th>Time Period</th>
<th>Purpose</th>
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<td>County</td>
<td>Speed Travel Time</td>
<td>Google Traffic / Waze</td>
<td>Crowd-Sourcing</td>
<td>Freeways Highways Arterials</td>
<td>Within County Boundary</td>
<td>Ongoing</td>
<td>Operations Planning</td>
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<td>DOT</td>
<td>Volume</td>
<td>Collected Internally</td>
<td>Count Stations</td>
<td>Freeways Highways</td>
<td>Within District Boundary</td>
<td>Ongoing</td>
<td>Operations Planning Design</td>
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### Define High Level Challenges

#### Data Systems
- Data Collection
- Duplicative Efforts
- Data Storage
- Data Quality
- Data Standards
- Data Integration
- Documentation
- System Access

#### Technology and Tools
- Software
- Hardware
- System Interfaces
- IT Compatibility
- Business Intelligence Tools
- Analytical Tools
- Knowledge Management
- Network Issues

#### Management and Governance
- Business Rules and Processes
- Data Management
- Data Governance
- Coordination Resource Availability
- Training Needs
Gap Assessment

Identify gaps and overlaps in program activities

- **Data Systems**: Data systems, elements, collection methods, duplicative efforts, storage environments, quality of data, standards, integration, data analysis, documentation, and system access

- **Technology and Tools**: Software, hardware, system interfaces, IT compatibility, business intelligence tools, analytical tools, knowledge management, and network issues
Data Governance, Culture, and Collaboration: Gaps related to business rules and processes, data management, data governance, coordination across business lines, resource availability, and training needs
Gap Assessment

- Data Collection, Management, and Technical Standards.
- Data Integration and Expandability.
- Data Storage and Access.
- Technology and Tools.
- Data Governance.
- Culture.
- Collaboration.

**KEY**

<table>
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<th>Current Level</th>
<th>Desired Level</th>
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**Maturity Level**

1 2 3

![Current](current.png) ![Small Gap](small_gap.png) ![Large Gap](large_gap.png)
Gap Assessment

Data Collection, Management, and Technical Standards.
Data Integration and Expandability.
Data Storage and Access.
Technology and Tools.
Data Governance.
Culture.
Collaboration.

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<th>Current Level</th>
<th>Desired Level</th>
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</table>

Maturity Level
1 2 3
Step 4. Improvement Strategies

- Identify Improvement Strategies
- Identify Priorities
- Assign Responsibility
- Implementation Schedule
Develop Data Governance Model

- Relationship between agency’s strategic vision, mission, and goals for data, agency’s data programs, offices responsible for implementing data governance, and users/stakeholders for data programs

Define **roles and responsibilities** to support a data governance model

- Data Governance Council
- Data Stewards
- Data Business Owners
- Data Custodians
- Working Groups
- Community of Interest
Develop Data Governance Model

- Strategic Vision, Mission, Goals for Data
- Data Governance Board
- Agency Data Programs
- Division(s) Mission(s) and Goals
- Data Users and Stakeholders
- Data Stewards and Custodians
# Data Governance Roles

<table>
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<tr>
<th>Role</th>
<th>Description</th>
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<tr>
<td>Data Governance Council</td>
<td>Senior level managers who establish policies for data management</td>
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<tr>
<td>Data Stewards</td>
<td>Ensure data is collected, managed, and used in accordance with policies</td>
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<tr>
<td>Data Business Owners</td>
<td>Establish business requirements for use of data</td>
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<tr>
<td>Data Custodians</td>
<td>Provide IT support for data systems</td>
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<tr>
<td>Working Groups</td>
<td>Research technical issues and provide recommendations to the Board</td>
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<tr>
<td>Community of Interest</td>
<td>Stakeholders who share a common interest as users of data systems</td>
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Develop Documentation

Data Governance Manual
- Documents policies, standards, roles and responsibilities for data management

Data Catalog
- Documents data systems and offices responsible for maintaining those systems

Business Terms Glossary
- Defines commonly used business terms
Step 6

Data Management Practices

- Identify data management practices, standards, and policies that apply to the management of roadway travel mobility data
  - Data acquisition
  - Data quality
  - Data standards
  - Business analysis tools
  - Data privacy and security

  - Data storage and access
  - Traceability
  - Performance measures
  - Risk assessment
  - Knowledge management
Data is an Asset (so it should be managed like an asset)

- Should have an owner
- Should have known quality rules
- Ensure meta data is in place
- Data standards to reduce time and costs of maintenance of redundant data sources

Create data once, store once, use many times

Define data from an enterprise perspective, define data so that it is sharable across partners
Step 7

Develop Data Business Plan

Compile results from previous steps into a single document

- Desired state
- Stakeholder outreach
- Data assessment and gap analysis
- Improvement plan
- Data governance framework
- Data management practices
Implement the strategies & actions contained in Improvement Plan

Formalize staff roles & responsibilities to support data governance

Monitor & report on implementation progress
  • Progress updates at Data Governance Council meetings
  • Annual briefings to senior management
Pilot States and Regions
Hillsborough MPO Pilot

Pilot Goals

- Increase knowledge of current and future partner agency data sources available for performance based planning
- Develop a data management plan that promotes collaboration and sharing of data sources needed to calculate performance measures
- Develop a plan for integrating partner agency data into existing databases to achieve performance based planning

- Speeds
- Travel-time reliability
- Return on investment
- Connected vehicle outputs
Roadway travel mobility data is defined as travel time and speed data for roadway users in the Hillsborough MPO area.
A framework for partner agencies to share roadway travel time and speed data for people roadway users and freight within the Hillsborough MPO area for planning purposes.
Hillsborough Recent Progress

- Regional Big Data Working Group Kick-off
  - Invited four presenters to share their vision for a shared data platform

- In the process of finalizing wanted/needed features for the platform

- Identified two possible platform providers

- Time to talk about $$$
Hillsborough Next Steps

- Execute memorandums of understanding with small group of partners
- Determine which provider will build the platform
- Sign interlocal agreements to finance platform development and maintenance agreements
Mid America Regional Council

- Framework to support mobility performance management
- Data types:
  - Transit on-time performance
  - Bicycle/pedestrian counts
  - Travel time/speed for vehicles and freight
  - Vehicle miles traveled for vehicles and freight

- The long term vision of the DBP is for internal and external stakeholders to know what mobility data is available and how they can obtain it
Mid America Regional Council - Data Governance Model

A. Data Coordination Committee (DCC)

DCC Co-chairs

- Transportation / Environment
  DCC Liaison
- IT
  DCC Liaison
- Workforce
  DCC Liaison
- Aging
  DCC Liaison
- Emergency Preparedness
  DCC Liaison
- 9-1-1
  DCC Liaison
- Public Affairs
  DCC Liaison

B. Department Director’s Meeting

C. Mobility Data Stewards

D. Mobility Data Users and Stakeholders
Maryland SHA Background

- Mature data management practices – *Mobility Programs* and *Transportation System Management and Operations (TSM&O) Plan*
- Annual Mobility Report (now in its 6th year) is part of the transportation decision-making process
- **Data Business Plan** is considered a key foundation to data driven decision-making
- Recently re-organized to create the Innovative Planning and Performance Management Division
Maryland SHA Mobility DBP

- High level **action plan** for improving mobility data and serve as the TSM&O DBP recommended in the TSM&O Strategic Plan
- **Example** of how other areas within MDOT SHA could approach the process of developing similar plans
- **Documentation** of existing geographic information system related data governance
- Recommendations for MDOT SHA to enhance data governance activities at an **enterprise level**
The Multimodal Mobility Framework is the interaction, structure, and components for Maryland DOT SHA to integrate and report on mobility data.
Maryland SHA Architecture

Multimodal Mobility Framework (MMF)

Planning  Real-time

MPOs  CHART  SHA-GIS  RITIS  Other

Data Sources
Maryland SHA Implementation Plan

Data

- Address General Action Items from Data Assessment
- Address Action Items Specific to Each Data Type from Data Assessment

Architecture

- Finalize High Level Architecture

Governance

- Implement Data Governance Framework
**Vision:** The Kansas DOT and its safety data stakeholders will have a sound, comprehensive, and well-coordinated approach to managing, improving, and applying the State’s safety data and analysis resources.

**Mission:** Achieve sound governance of safety data resources, enhance integration of safety data systems, continually improve the quality and usability of data, and promote user friendly and easily accessible safety data by our safety users and partners for their business analysis.
Kansas Implementation Roadmap

1. Assign responsibility for implementation
2. Improve quality of safety data systems
3. Implement safety data governance
4. Improve data integration & collaboration
5. Improve tools for safety analysis
6. Initiate training
7. Monitor progress
Washington State DOT Pilot

**Vision:** WSDOT’s business decisions will be supported by reliable, timely, accessible, and complete safety data

**Mission:** WSDOT will have integrated safety data systems that are user friendly and easily accessible (as appropriate) by our safety users and partners for their business analysis
Washington Risk Assessment

- Risk Identification
- Risk Evaluation
  - Likelihood (frequency) and severity (degree of impact)
- Risk Analysis
  - Rank and prioritize the risks
  - Determine level of risk based on likelihood and severity
  - Assign responsibility for managing risks
- Risk Response
  - Determine action to address risks
## Risk Analysis

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<th>Very High</th>
<th>High</th>
<th>Medium</th>
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### Level of Risk

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<th>4</th>
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The consequence requires intervention from executive management, the Secretary of Transportation, or the Governor; requires prompt action by the Secretary of Transportation to implement new Departmental-level controls to treat the risk.

The consequence affects the ability of WSDOT to carry out its mission and strategic plan - existing controls must be effective and requires additional action to be managed at the executive management level.

The consequence impacts completion of a critical WSDOT function - existing controls must be effective and possibly additional action implemented - action to be managed at Division level.

The risk is managed within current practices and procedures - impacts are dealt with by routine operations at Director/Office level - monitor routine practices and procedures for effectiveness.
Washington Lessons Learned

Define problem in “simple language”

Communicate intent throughout project

Scope of data issues difficult to convey to Executives

Recognize specialities in data in order to focus scope

Continue asking the question, Is this within intended scope?

Involve stakeholders needed for the conversation
Why does this matter to you?
Benefits of Data Business Planning

Help understand
- What mobility/safety data is being collected
- How the data supports planning, operations & performance measure activities
- Who is responsible for managing/updating the data

- Solidify working relationships by identifying how partner agencies share and exchange mobility data
- Help identify duplicative data collection efforts
- Lead to more rapid, targeted data acquisitions and reduced costs
FHWA Resources

➢ Guidance on State Safety Data Systems

➢ Safety Data Management & Governance Website
## For More Information

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<tr>
<th></th>
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<td>FHWA Office of Safety</td>
<td>Stuart Thompson</td>
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Questions