Data Governance and Management for Better Transportation Decisions

FHWA Data Business Plan Peer Exchange

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MOBILITY/ TSMO DATA BUSINESS PLAN EFFORTS
Outcomes of FHWA/MDOT SHA Mobility DBP

- High level action plan for improving mobility data and serve as the TSMO DBP to support TSMO Program

- Example of how other areas within MDOTSHA could approach the process of developing similar plans

- Recommendations for MDOTSHA to enhance data governance activities at an enterprise level
MDOT SHA TSMO DATA GOVERNANCE

**Mobility Data Programs**

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<tr>
<th>Tier 1</th>
<th>Tier 2</th>
<th>Tier 3</th>
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<tbody>
<tr>
<td>Traffic Volume</td>
<td>Origin/ Destination</td>
<td>Connected &amp; Automated Vehicle</td>
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<td>Traffic Speed</td>
<td>Accessibility</td>
<td>Research Data Exchange</td>
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<td>Truck Freight</td>
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<td>Work Zone</td>
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<td>Traffic Signal Timing</td>
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**Tier 2**
- Origin/Destination
- Accessibility
- Truck Freight
- Work Zone
- Signal Timing

**Tier 3**
- Connected & Automated Vehicle

**Source:** 2017 FHWA Data Business Plan – MD Pilot

**Interaction, structure, and components to integrate and report on mobility data**
MDOT DATA
GOVERNANCE
EFFORTS
MDOT comprises of six business units and an Authority. Strategic, Tactical, Operational Activities at the TBUs generates a highly complex set of data streams...

Many ways to look at the Data Streams...

By MODE – Highway, Transit, Air, Water, Other...

By FUNCTION - Planning, Engineering, Operations, Maintenance, Performance Management

By PERFORMANCE AREA – Safety, Mobility, Asset Management, Administrative, Business Transactions

By SOURCE - Internal vs External Data
MDOT DATA GOVERNANCE & DATA HUB

• Data Governance & Data Hub Overview

• Where Do We Want to Be?
  o Vision, Goals, and Objectives
  o Principles to Guide Implementation

• What Did We Learn?
  o MDOT’s Current State
  o Gaps in Data Governance
  o Review of Notable Practices

• What Do We Need to Do?
  o Develop an MDOT Data Hub
  o Take Action to Address Gaps in Data Governance

• How Can We Monitor and Evaluate Data Governance Implementation?
**PRINCIPLES & DIMENSIONS TO GUIDE DATA GOVERNANCE IMPLEMENTATION**

1. **VALUABLE**
2. **AVAILABLE**
3. **VALIDATED**
4. **SECURED**
5. **CLEAR**
6. **EFFICIENT**
7. **ACCOUNTABLE**

**People**
- Staff resources and training
- Organization
- Culture

**Processes**
- Procedures and documentation
- Accountability and incentives

**Technologies**
- Data assets
- Information systems
- Tools for Data Governance implementation

AASHTO Reference: [https://data.transportation.org/](https://data.transportation.org/)
MDOT DATA HUB – CONCEPTUAL FRAMEWORK

Data Sources
- MDOT Operational Systems
- Big Data from External Sources
- Legacy DB
- Flat Files

Staging Area
- Extract Transform Load
- Staging Area

Data Hub
- Metadata
- Raw Data
- Summary Data

Data Marts
- Viewer
- Reporting
- Analysis
- Data Mining

Applications

Users
- Mobile
- Tablet
- Laptop

Data Source Validation*
OTHER DATA
GOVERNANCE
INITIATIVES/
OPPORTUNITIES
MD & MDOTSHA GEOSPATIAL DATA GOVERNANCE & MANAGEMENT

Policies, standards and procedures to collect, manage, disseminate, utilize, and archive enterprise data and related applications.

- **Data Development**
  - MDOTSHA Geospatial Data Integrity-Data Submission Policy & Procedure
  - Maryland iMap Data Submission Policy

- **Data Sharing & Security**
  - DoIT Account Management Policy

- **Application Development**
  - MDOTSHA Standard Web Map Configuration in AGOL
  - MDOTSHA Web App Documentation in AGOL

- **Enterprise GIS Data Inventory**
  - Documented in standardized template
TRADITIONAL & BIG DATA APPLICATIONS

- **Real time applications**
  - System Monitoring
  - Incident Mgmt.
  - ATM/ ICM
  - Maintenance/ SOGR

- **Archived data applications**
  - Planning/ TSMO
  - Asset Management

- **Performance Management**
LONG RANGE AND TSMO PLANNING

Planning Data
- Census Data
- DLLR Employment Data
- Auto/Truck Count data
- NHTS/ACS.MPO HTS Data
- TAZ/Block-Level Socioeconomic Data
- Existing/Future Transportation Networks
- Future Investments (CLRP, TIP, CTP, etc.)
- Sector Plans, TODs, Activity Centers, etc.

Operations Data
- Signal Data
- Lane Configurations
- Probe/Speed Data
- Turning Movements
- Work Zone Limits
- Incident/Safety Data

Asset Data
- Centerline Attributes
- Pavement Attributes
- Roadway Structures
- Signal Systems
- ITS Assets (DMS, CCTVs, etc.)

Performance Management
- Infrastructure Conditions
- Segment, Corridor & System Performance
ASSET MANAGEMENT

WAZE CCP

PRIVATE ENTERPRISE DATA STREAMS

WEATHER  TRAFFIC  ROAD CONDITIONS

COMMON OPERATING PICTURE
NEXT STEPS

• Formalize Data Governance Structures for new Data streams

• EDC-5 Crowd Sourcing for Ops (Waze CCP) and Road Weather Management Strategies

• Work with FHWA on WZDx and other data exchanges

• Work with private sector, industry and associations for standardizing CAV and CATS data

• Review and refine Data Management Structures (on prem and/or cloud services)
CONTACT INFORMATION

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