Data Driven Decision Making

Data-driven decision making is an approach to business governance or operations which values decisions supported with verifiable data. The success of the data-driven approach is reliant upon the quality of the data gathered and the effectiveness of its analysis and interpretation

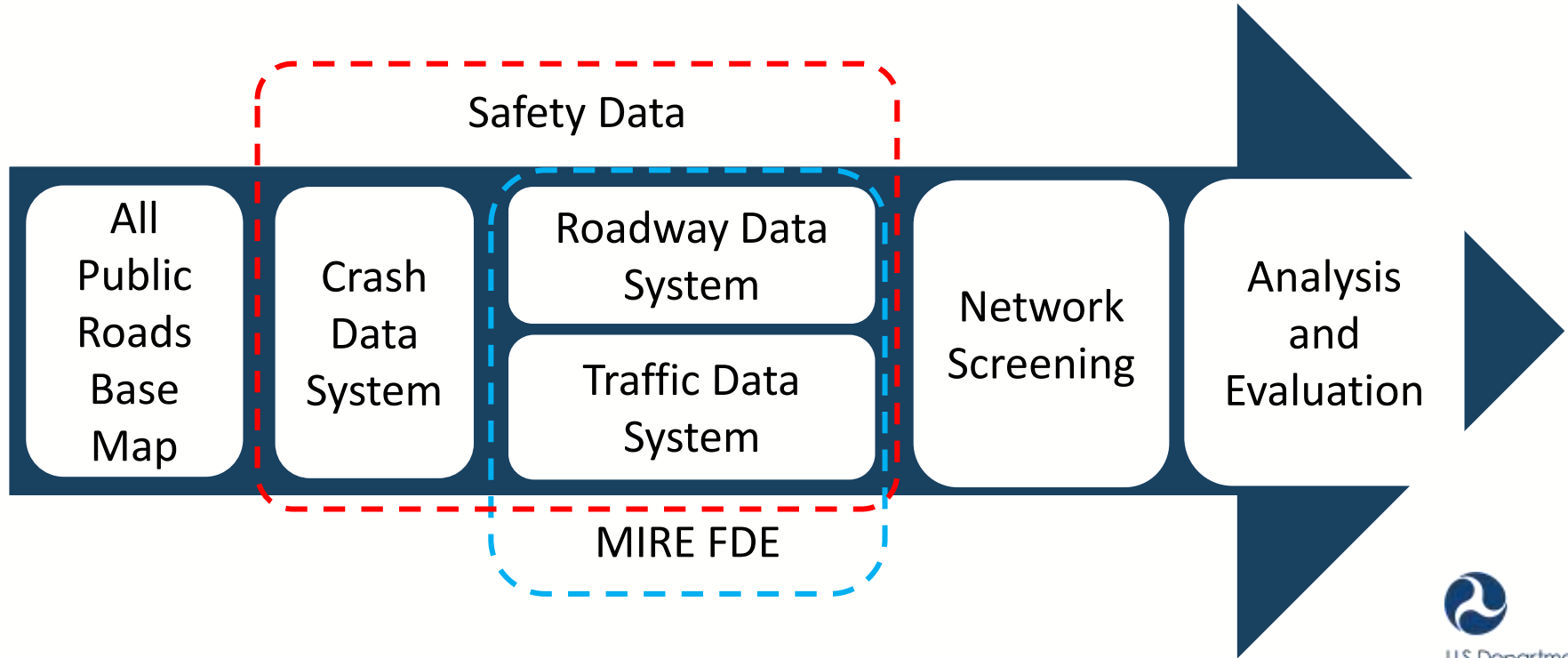# State and Local Safety Data Integration

Many Definitions of Integration

- Safety Data Integration can take place:
  - Across jurisdictions
  - Among safety databases
- Integration of processes
  - Hot Spot
  - Systemic

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State Safety Data Systems

Safety Data

| All Public Roads Base Map | Crash Data System | Roadway Data System / Traffic Data System | Network Screening | Analysis and Evaluation |

MIRE FDE

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All Public Roads Network - ARNOLD

- Crash, roadway, and traffic data should be linkable by geolocation, i.e., a unique location identifier, on a highway basemap, which is defined as "a representation of all public roads that can be used to geolocate attribute data on a roadway." …and linked to …licensing, vehicle, citation/adjudication, and emergency medical services or injury surveillance.

Applications of Enterprise GIS for Transportation, Guidance for a National Transportation Framework (AEGIST) – Pool Fund Study 1464

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Crash Data

- Crash location
- Date
- Collision type
- Severity
- Relationship to junction
- Maneuvers by involved vehicles

Minimum for Network Screening
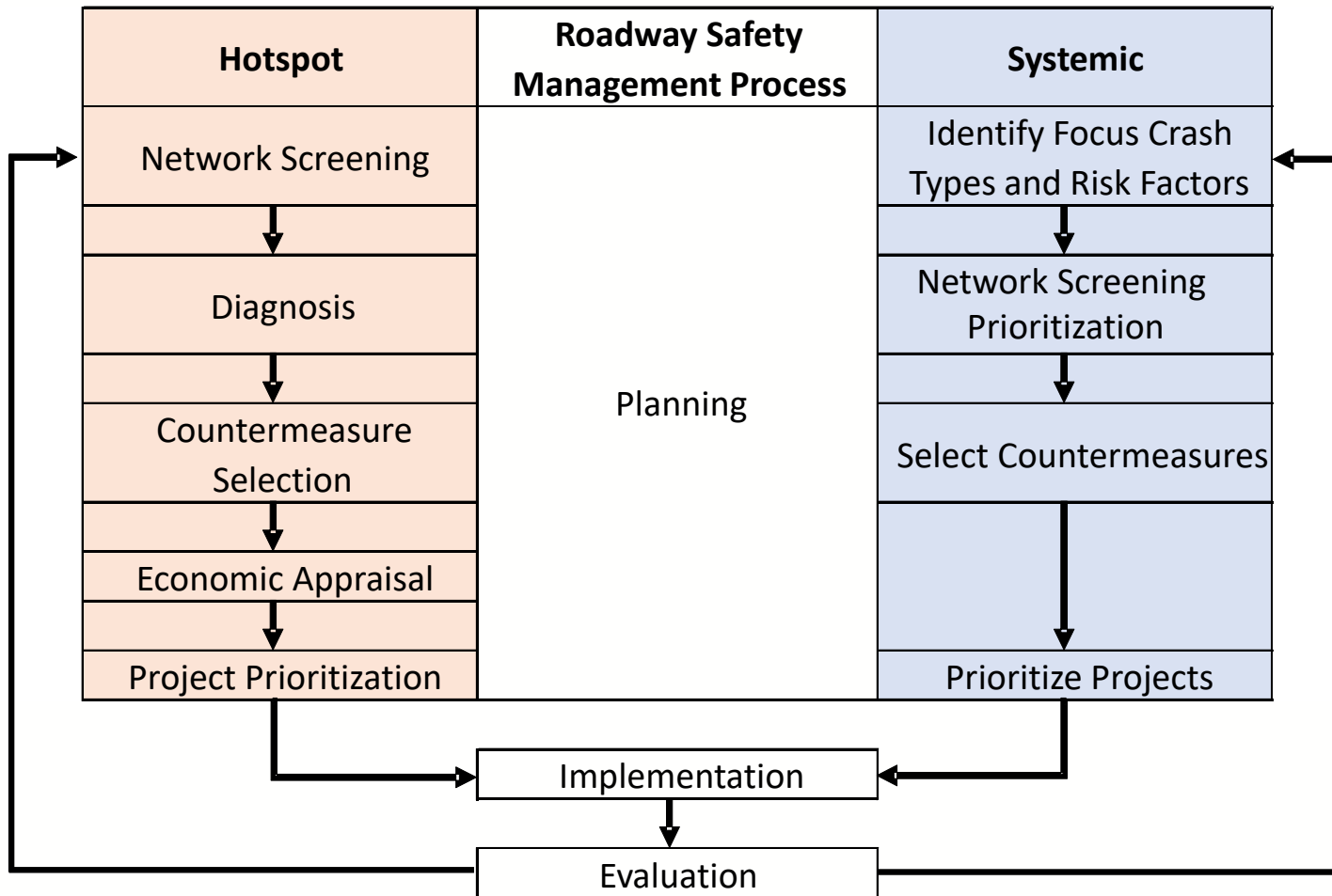
Model Inventory of Roadway Elements

1. Table 1, non-local paved roads
2. Table 2, Local Paved Roads
3. Table 3, Unpaved Roads

The FAST Act adds the provision that States may elect not to collect the MIRE FDE on gravel or otherwise unpaved roads as long as they meet two conditions:

A. The States do not use HSIP funds on any unpaved road for which they do not collect the MIRE FDEs [23 U.S.C. 148(k)(1)(A)]; and

B. The States demonstrate having consulted with affected Indian tribes before ceasing to collect data on roads included in the National Tribal Transportation Facility Inventory [23 U.S.C. 148(k)(1)(B)].

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Hotspot	Roadway Safety Management Process	Systemic
Network Screening		Identify Focus Crash Types and Risk Factors
Diagnosis		Network Screening Prioritization
Countermeasure Selection	Planning	Select Countermeasures
Economic Appraisal		
Project Prioritization		Prioritize Projects

Implementation

Evaluation

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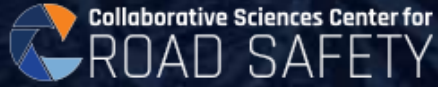**Federal Highway Administration**

Capabilities Assessments

- Base 2011
  - Data Governance
  - Data Integration
- Capabilities Assessment II – 2019

Technical Assistance
- GIS Pool Fund Study
- Data Business Planning Governance and Integration
- Traffic Volume collection and estimation Non-Federal Aid Roads
- MIRE FDE Collection Non-Federal Aid Roads

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Current Challenges

- Lack of formal processes
  - Very few formal data governance examples
  - States don't manage data quality
  - Data integration fails with poor quality

- Partnerships
  - Safety business unit doesn't own the safety data
  - State agencies "want to get their own house in order"
  - Enforcing data standards is sensitive

- Move to all public roads network
  - Progress, but lots of balls in the air
  - Meeting everyone's needs with Enterprise GIS

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Capability Maturity Models

Image from Google Image Search
Public Domain Pictures

Prioritizing Capabilities

- State Capabilities Assessments
  - Safety-specific example for FHWA
  - GIS examples (URISA 2013, SLIMGIM-T, and Wells 2018)

- To share and integrate roadway data you need:
  - Common base layer
  - All spatial data tied to locations on that map
  - Points, segments, routes, and jurisdictions

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Typical CMM — 5 Levels

5. Optimized (think, work, and act globally)

4. Enterprise

3. Partially Implemented

2. Planned / Early Stage

1. Ad Hoc (think, act, work locally)

CMM & Data Management

- States can self-assess: how're we doing?

- Technical assistance available

- Training & guidance available

- CMM scores feed an *Action Plan*

- Action plans can feed strategic plans:
  - Traffic records improvement plan
  - Strategic Highway Safety Plan
  - others

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Purpose and Goal

- Improve Data:

  – Promote Data Governance & Business Planning

  – Develop a roadmap for data integration

  – Fit into Enterprise GIS

  – Help States get to desired capability levels

- Do a Better Job: More efficient and safer roads

Data Governance

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Data Management

Top-down decisions on IT environment, methods, and tools.

Management

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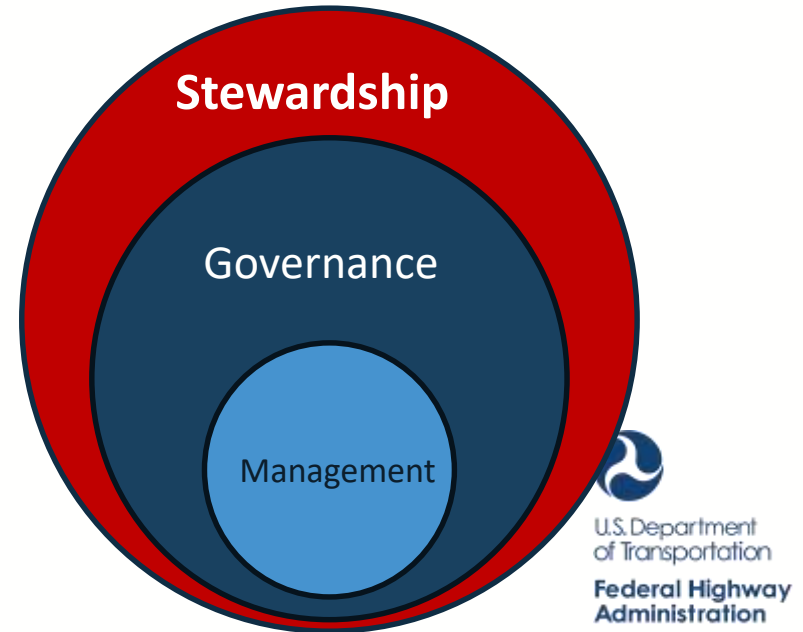Administration**
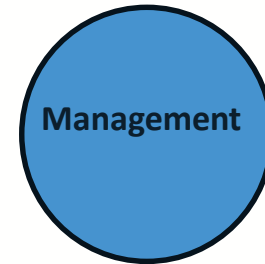
Data Governance?

Implements those decisions in specific domains or enterprise-wide.
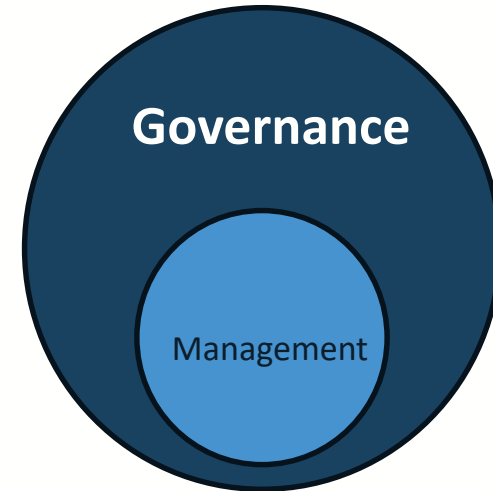
Data Stewardship?

The people (and job functions) responsible for data entry, addressing quality problems, conducting analyses, meeting customers' needs.

Stewardship

Governance

Management

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Three necessary parts

- Data governance roles & responsibilities

- Data governance policies

- Data governance processes

Data Governance Council

- Oversight over managing data governance activities
- High-level managers & executives
- Guarantees senior-level decision-maker "buy in"
- Authorizes implementing the data vision, mission, and goals
- Helps to set the vision, mission, and goals too!
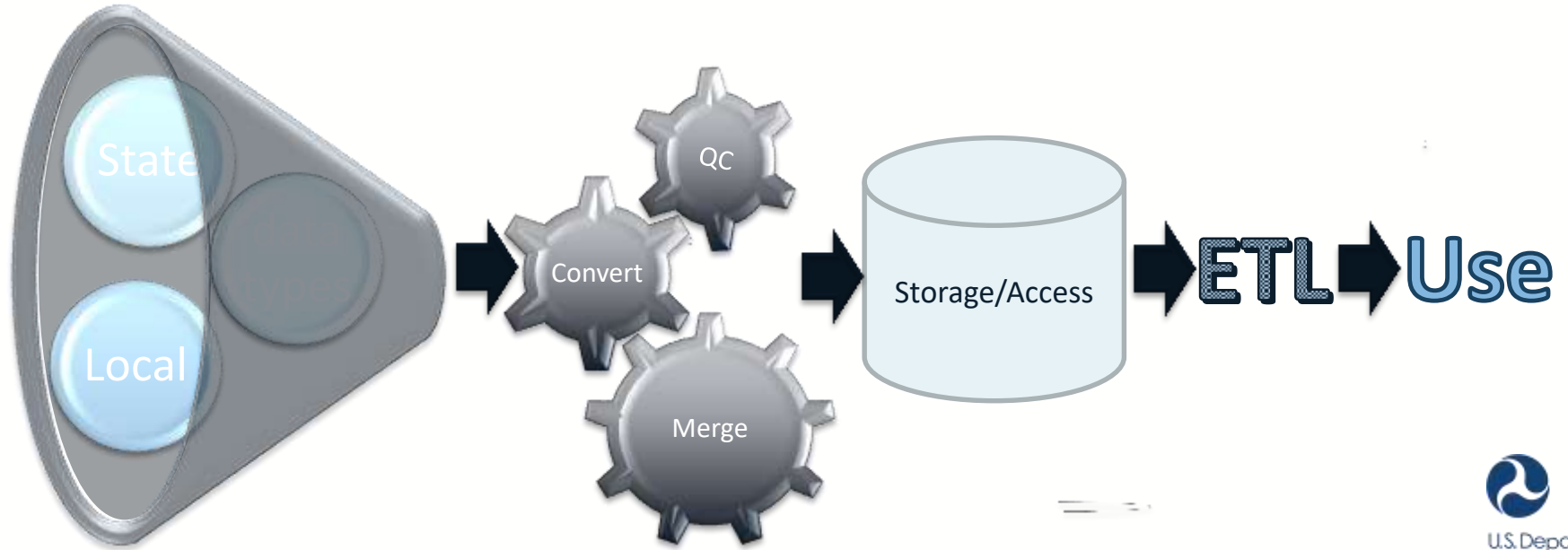- Decision-making authority over agency data programs and personnel

- Or…the practical equivalent fulfilling the need in the agency

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Data Integration

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Data Integration, Access, and Use

Data Integration

- Safety Data = Crash, Roadway, and Traffic

- Other business needs have different data requirements

- Integration can take place:
  - Across agencies & jurisdictions
  - Among safety databases within an agency

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Benefits of Data Integration

- **Availability**

- **Timeliness**

- **Accuracy and Integrity**

- **Consistency and Clarity**

- **Completeness**

- **Reduce Duplication**

- **Faster Processing Time**

- **Lower Data Acquisition and Storage Cost**

- **Informed and Defensible Decisions**

- **Enhanced Program Development**

- **Greater Accountability**

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Data
Business
Plans

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What is a Data Business Plan?

A Data Business Plan (DBP) guides an agency's data management practices.

- Includes standards, policies, and procedures for safety data systems, databases, and processes.

- Living document describing agency's vision, goals, objectives, and actions for data management.

*NCHRP Report 666: NCHRP Report 666 – *Target-Setting Methods and Data Management to Support Performance-Based Resource Allocation by Transportation Agencies*

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Why is a DBP Important?

- Aids collaboration among technical and data staff
- Promotes cooperation with IT staff
- Helps business units understand data supports
- Links responsibilities to agency mission and goals
- Demonstrates benefits of data investment

The process is as important as the outcome!

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Data Business Planning

- A formal planning process
- Describes data needs and how to fill them
- Includes a roadmap to completion
- Action / implementation plan
- Inclusive and cooperative

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Enterprise GIS Pooled Fund Study

- Phase 1: Establish Standards/Guidance
  - FHWA funded this already
  - Work will last about 1 year

- Phase 2: Develop and Implement the Model
  - FHWA is seeking State partners now (some already)
  - Non-match SPR a possibility

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Closing Discussion

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