United States Department of Transportation (USDOT) Mobility Data Business Plan (DBP) and Assistance to States and Local Jurisdictions

Share Your Knowledge - Webinar

Walter During, PE
Transportation Specialist
Federal Highway Administration (FHWA)
Office of Operations

Date: June 8, 2021
Time: 1:30 PM to 3:00 PM (EST)

Discussion Agenda

1. Background

2. High-level overview of FHWA Mobility Data Business Plan Guide

3. Typical objectives and outcomes

4. Beneficiaries of workshops conducted to-date

4. Opportunities

U.S. Department of Transportation
Federal Highway Administration

USDOT Data Gaps White Paper

Gaps identified:

- Data gaps
- Coordination gaps
- Data standards and governance gaps

The recommendation:

- To develop, implement, and maintain a Data Business Plan

U.S. Department of Transportation
Federal Highway Administration

What is a Data Business Plan (DBP)?

A DBP is a plan for efficient use of people, processes, and technology. It links business objectives, programs, and processes to data systems, services, and products, and guides an agency in data management practices.

Mobility Data Coordination Group

Formal Designation of Mobility Data Coordination Group to coordinate on data issues:

- **Data gaps/overlaps in specific types of roadway mobility data**
    - Infrastructure/inventory
    - Roadway travel mobility data (speed/volume)
    - Climate data
    - Modal data
    - Data capture activities associated with research in wireless Connected Vehicle technologies sponsored by the Intelligent Transportations Systems Joint Program Office
- **Cross-cutting data management issues that impact all data types**
   - Data quality
    - Standards
    - Privacy/security

U.S. Department of Transportation
Federal Highway Administration

Benefits of Data Business Planning

Help local partners understand:

- What mobility data is being collected within their organizations and at the regional level
- How the data supports mobility planning, operations and performance measure activities
- Who is responsible for managing/updating the data

Help identify potential duplicative data collection efforts
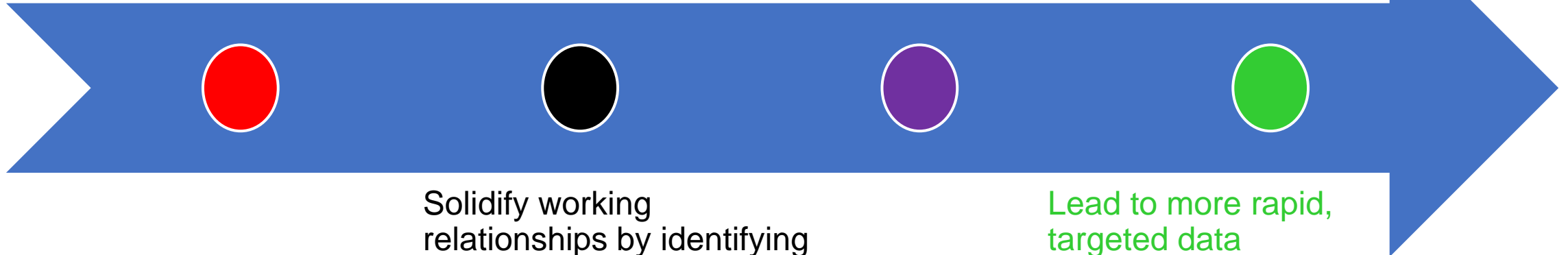
Solidify working relationships by identifying how partner agencies share and exchange mobility data, both internally and externally

Lead to more rapid, targeted data acquisitions and reduced data collection/management costs in the future

Background

Multi-year effort at FHWA's Office of Transportation Operations

First developed and implemented best practices in data governance and management

Then developed a draft DBP guide to be shared with local, regional, and state agencies

Draft was tested, refined and finalized based on lessons learned from three pilots –

- Hillsborough MPO (Tampa area, Florida)
- Mid-America Regional Council (Kansas City area)
- Maryland DOT

U.S. Department of Transportation
Federal Highway Administration

USDOT Data Business Plan Guide

U.S. DEPARTMENT OF TRANSPORTATION ROADWAY TRANSPORTATION DATA BUSINESS PLAN (PHASE 3)

DATA BUSINESS PLAN DEVELOPMENT FOR STATE AND LOCAL DEPARTMENTS OF TRANSPORATION

Final Report

November 2017

Publication number — FHWA-HOP-18-009

U.S. Department of Transportation
Federal Highway Administration

https://trid.trb.org/view/1601577

Data Business Plan Pilot Reports

MARYLAND STATE HIGHWAY
ADMINISTRATION PILOT OF THE
DATA BUSINESS PLAN GUIDE FOR
STATE AND LOCAL DEPARTMENTS
OF TRANSPORTATION

DATA BUSINESS PLAN

Final Report
November 2017
Publication number — FHWA-HOP-18-010

U.S. Department of Transportation
Federal Highway Administration

MID-AMERICA REGIONAL
COUNCIL PILOT OF THE DATA
BUSINESS PLAN FOR STATE AND
LOCAL DEPARTMENTS
OF TRANSPORTATION

DATA BUSINESS PLAN

Final Report
November 2017
Publication number—FHWA-HOP-18-012

U.S. Department of Transportation
Federal Highway Administration

HILLSBOROUGH METROPOLITAN
PLANNING ORGANIZATION PILOT
OF THE DATA BUSINESS PLAN FOR
STATE AND LOCAL
DEPARTMENTS OF
TRANSPORTATION

DATA BUSINESS PLAN

Final Report
November 2017
FHWA-HOP-17-018

U.S. Department of Transportation
Federal Highway Administration

https://trid.trb.org/view/1601576   https://trid.trb.org/view/1601575   https://trid.trb.org/view/1601578

U.S. Department of Transportation
Federal Highway Administration

9

Data Business Plan Guide Steps

1. Establish Needs and Objectives

2. Stakeholder Outreach

3. Data Assessment

4. Gap Assessment

5. Improvement Strategies

6. Data Governance Processes and Documents
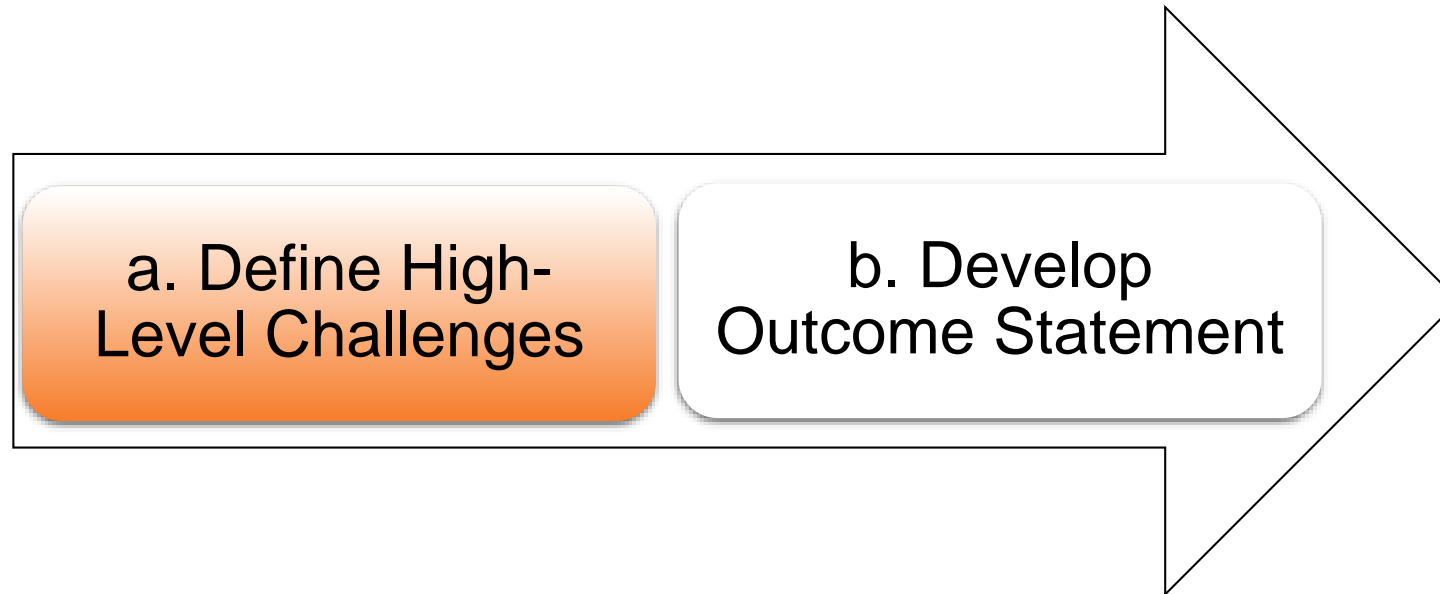
7. Data Management Practices

8. Develop Implementation Roadmap

9. Develop Data Business Plan

U.S. Department of Transportation
Federal Highway Administration

Step 1. Establish Need and Objectives

Step 1. Establish Need and Objectives

Step 1a. 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

Step 1b. Develop Outcome Statement

Describes the results the DBP will achieve

- Develop a **framework** for partner agencies to share mobility data for roadway users and freight within the region for planning purposes

- Develop a **process** for developing, collecting, calculating, and reporting on performance measures to support mobility in the region

U.S. Department of Transportation
Federal Highway Administration

Step 2. Stakeholder Outreach

U.S. Department of Transportation
Federal Highway Administration

Step 2. Stakeholder Outreach
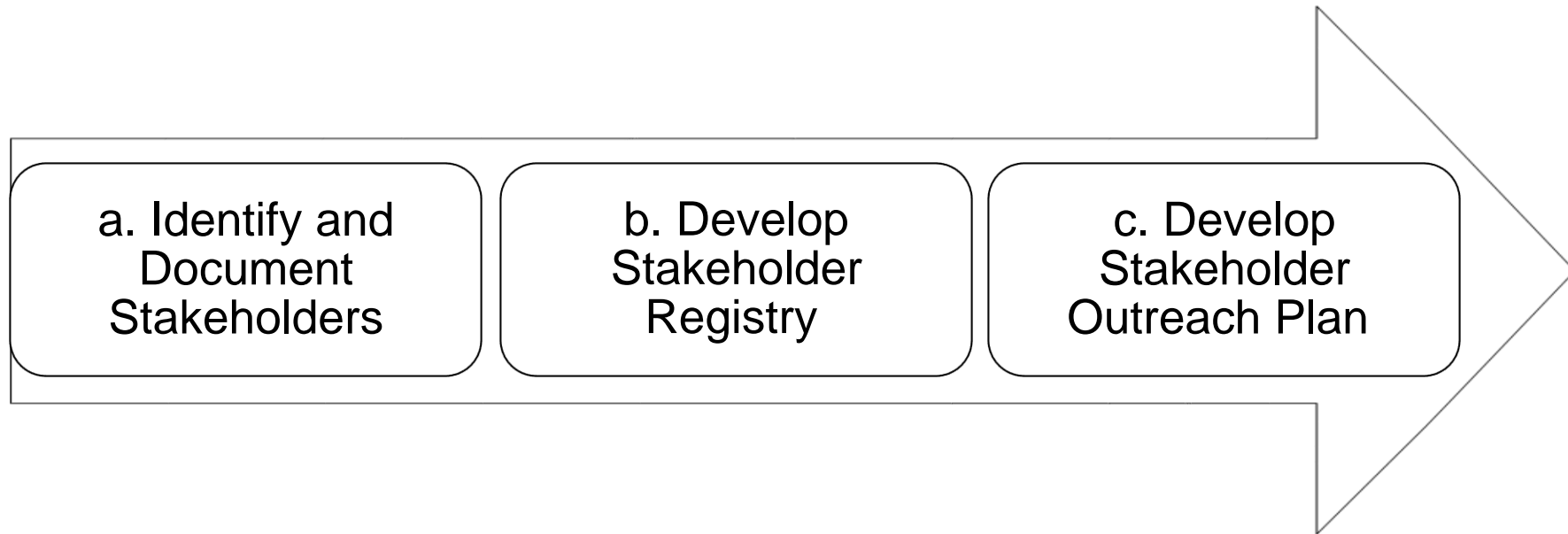
a. Identify and Document Stakeholders

b. Develop Stakeholder Registry

c. Develop Stakeholder Outreach Plan

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

Internal Stakeholders

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

Core Stakeholders

Champions for the DBP effort

U.S. Department of Transportation
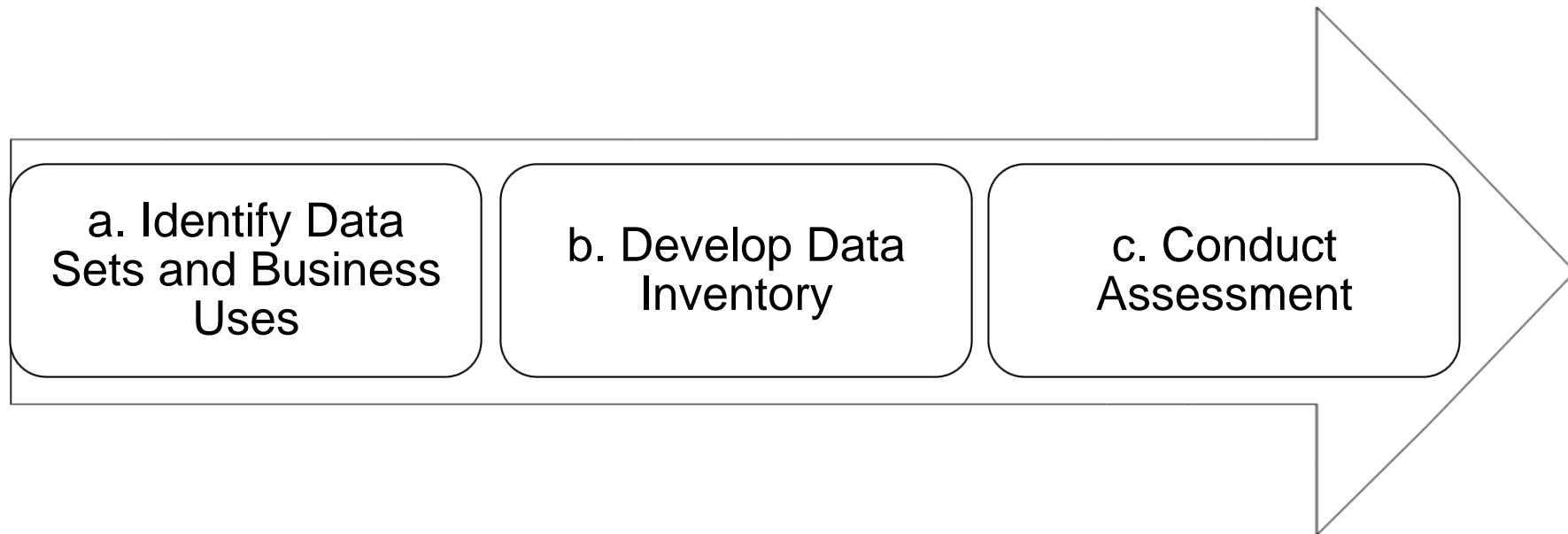**Federal Highway Administration**

17

Step 2c. Develop Stakeholder Outreach Plan

- Stakeholder involvement in each step of DBP development
- Desired feedback
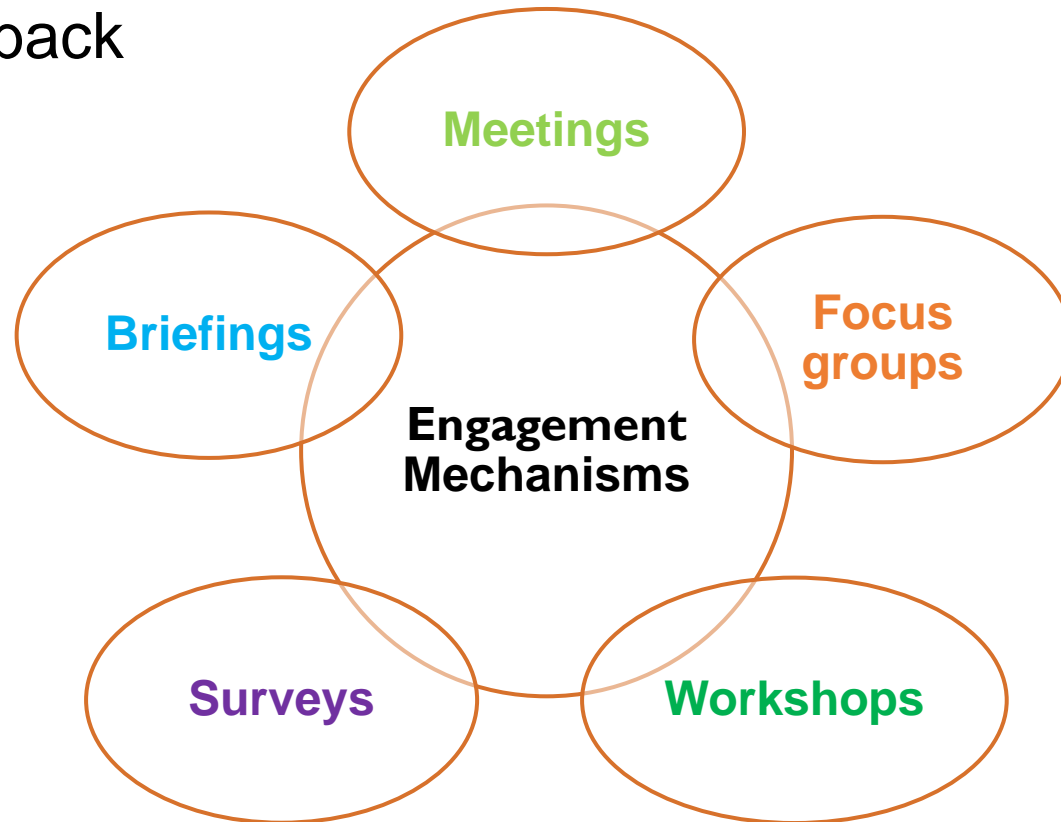
Step 3. Data Assessment

Step 3. Data Assessment

a. Identify Data Sets and Business Uses

b. Develop Data Inventory

c. Conduct Assessment

Step 3a. Identify Data Sets and Business Uses

Integrate Speed and Volume Data

- Mobility Performance Measures

Integrate Speed, Travel Time, and Incident Data

- Analyze Bottlenecks
- Analyze Impacts of Operations Projects

U.S. Department of Transportation
Federal Highway Administration
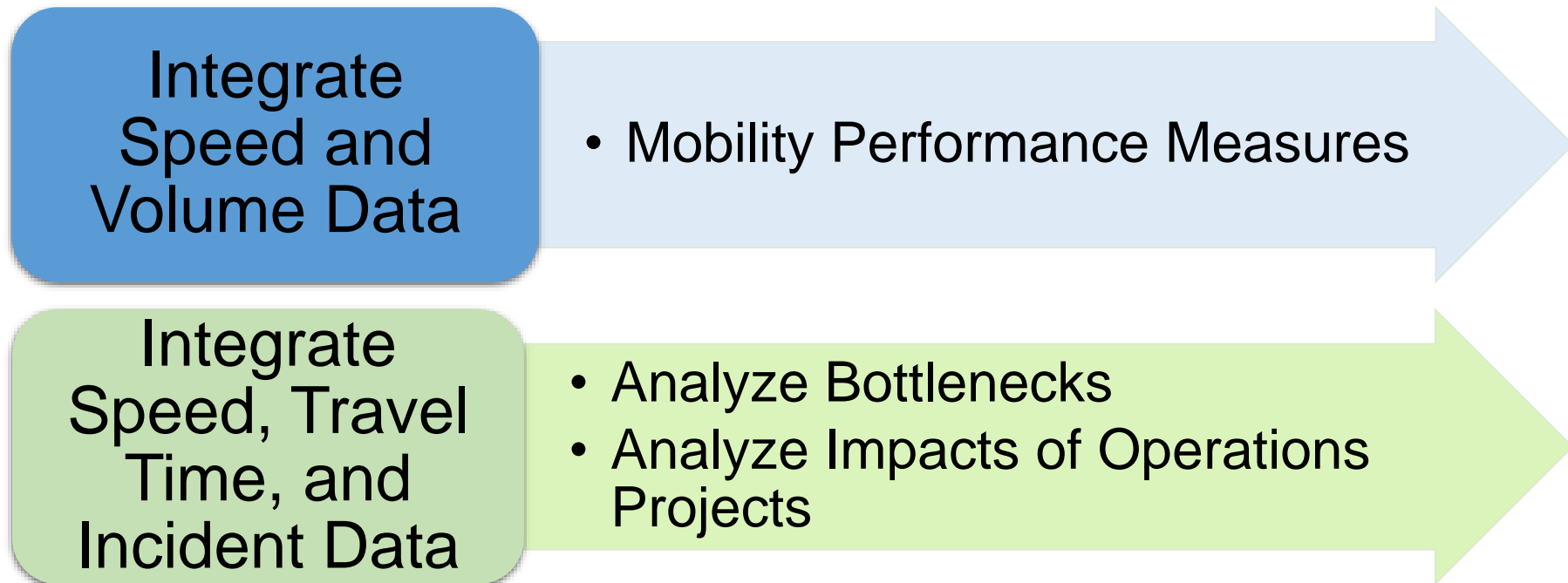
Step 3b. Develop Data Inventory

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

Agency	Mobility Data	Data Source	Data Collection Method	Network Type	Geographic Boundary	Time Period	Purpose
County DOT	Speed Travel Time	Google Traffic / Waze	Crowd-Sourcing	Freeways Highways Arterials	Within County Boundary	Ongoing	Operations Planning
State DOT	Volume	Collected Internally	Count Stations	Freeways Highways	Within District Boundary	Ongoing Samples	Operations Planning Design

Step 3c. Conduct Assessment

- Assessment Areas

  Data collection, management and technical standards

  Data interoperability and expandability
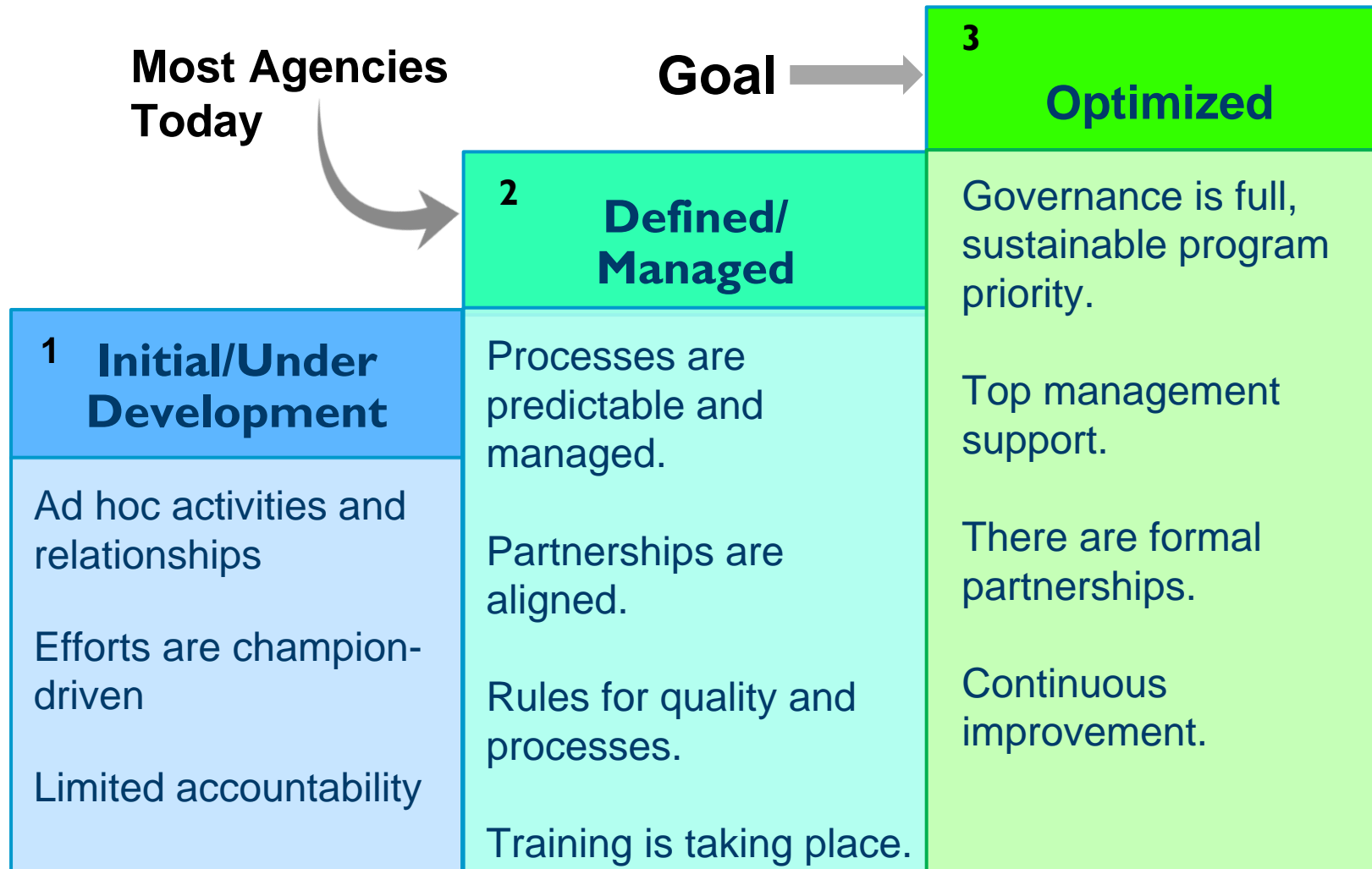
  Data storage and access

  Technology and tools
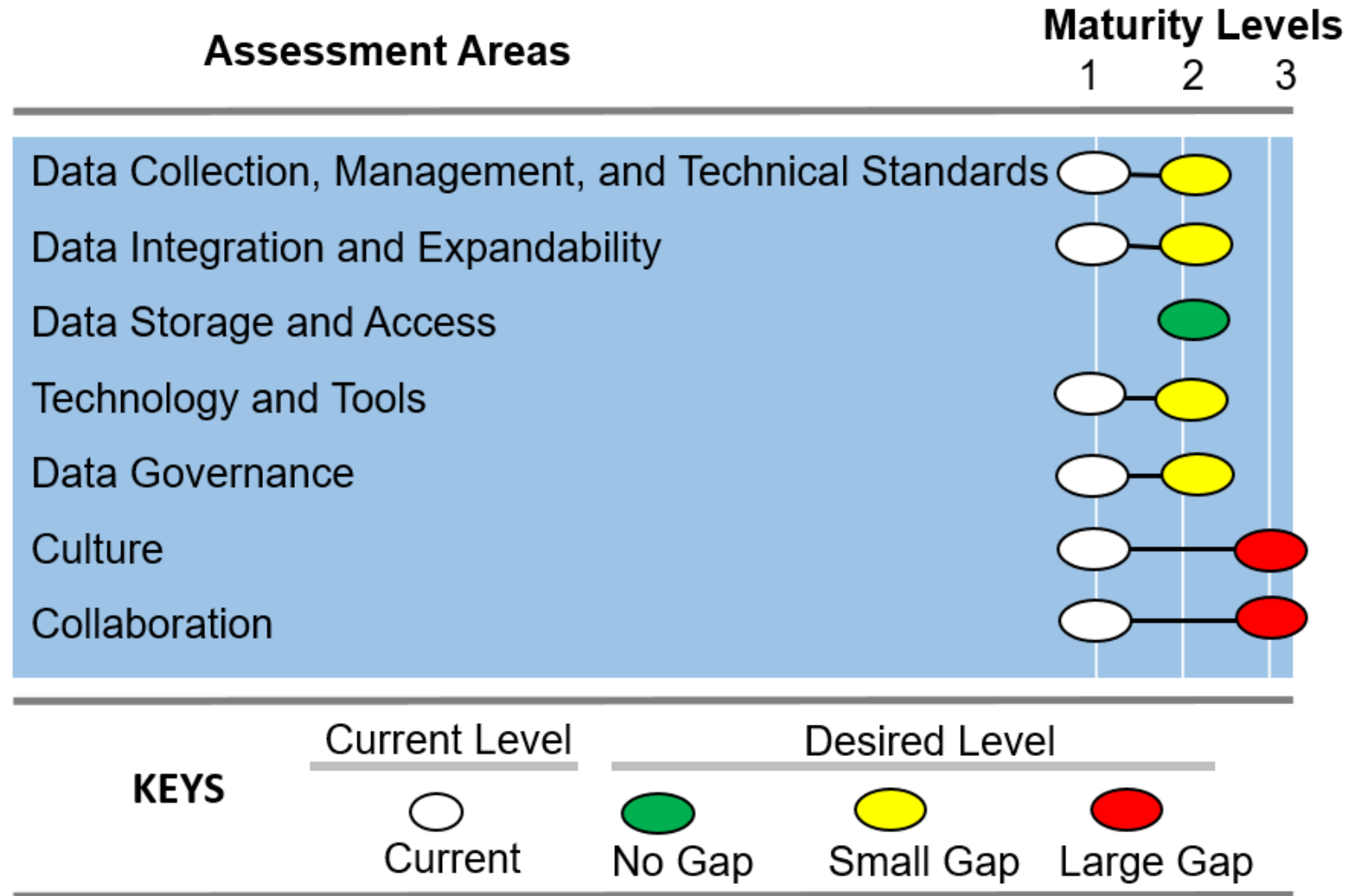
  Data governance, culture, and collaboration

- Assess current level of maturity

  ➢ Data management maturity model

Step 3c. Conduct Assessment (Cont.)

Most Agencies Today

Goal ⟶

3
Optimized

Governance is full, sustainable program priority.

Top management support.

There are formal partnerships.

Continuous improvement.

2
Defined/ Managed

Processes are predictable and managed.

Partnerships are aligned.

Rules for quality and processes.

Training is taking place.

1 **Initial/Under Development**

Ad hoc activities and relationships

Efforts are champion-driven

Limited accountability

24

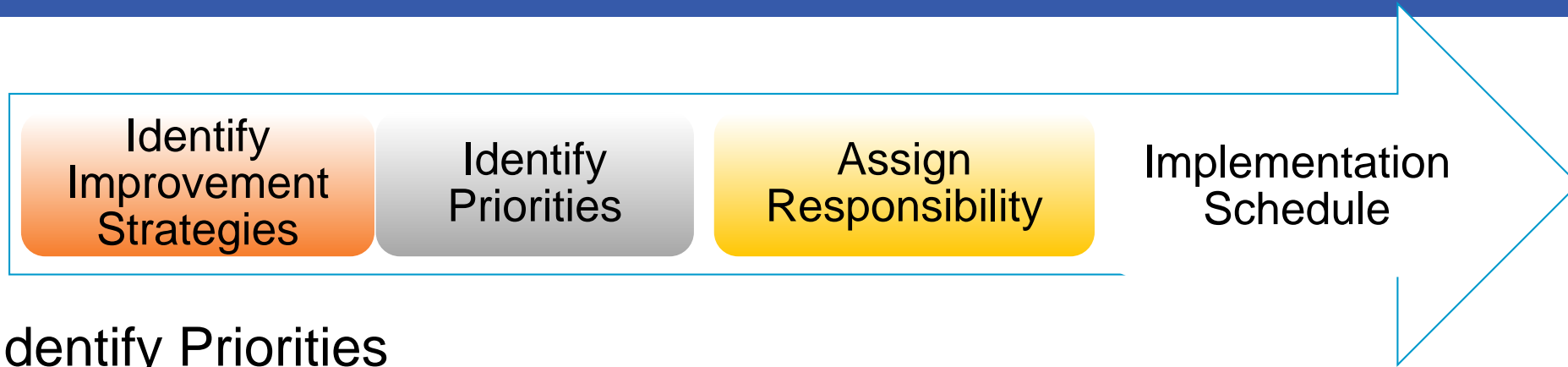Source: Federal Highway Administration, FHWA-HOP-18-009

Step 4. Gap Assessment

Step 4. Gap Assessment

- Identify gaps and overlaps that exist in program activities:
  - **Data Systems:** Gaps related to data systems, data elements, data collection methods, duplicative data collection efforts, data storage environments, quality of data, data standards, data integration, data analysis, documentation, and system access
  - **Technology and Tools:** Gaps related to 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

U.S. Department of Transportation
Federal Highway Administration

27

Step 5. Improvement Strategies

U.S. Department of Transportation
Federal Highway Administration

Step 5. Improvement Strategies

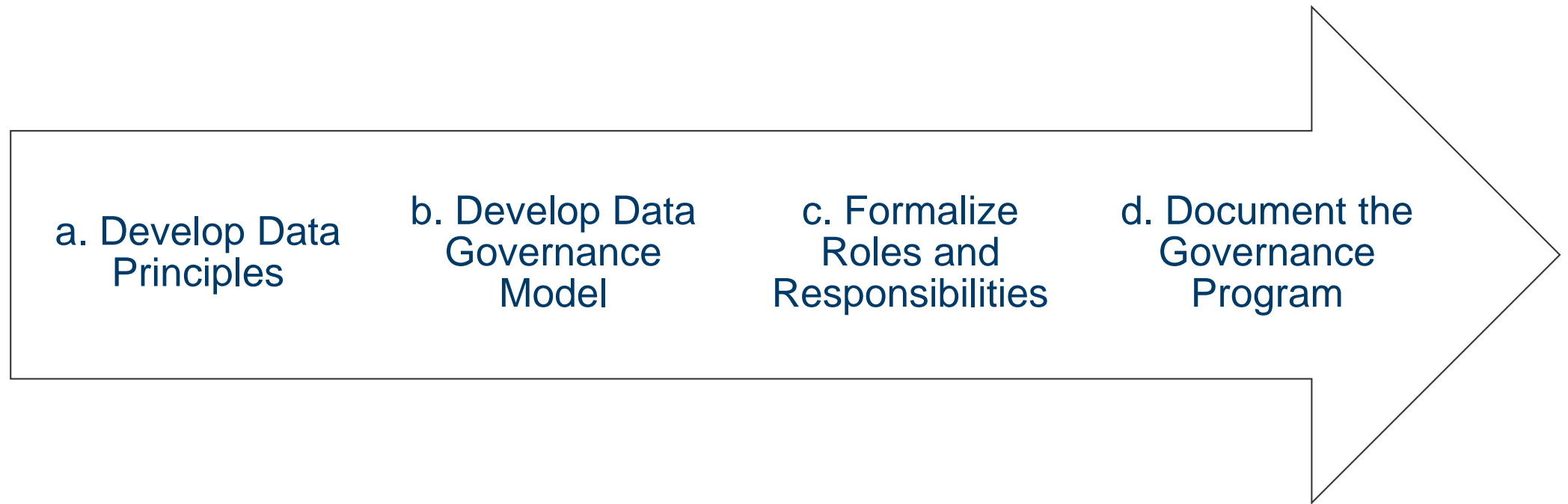| Identify Improvement Strategies | Identify Priorities | Assign Responsibility | Implementation Schedule |

Identify Priorities

Prioritize strategies to identify most critical needs:

- **Low Priority:** Investment and benefit does not add significant value

- **Medium Priority:** Implement as time and investment permits

- **High Priority:** Implement as soon as possible, as these strategies significantly improve assessment area and gaps

U.S. Department of Transportation
Federal Highway Administration

Step 6. Data Governance Processes and Documents

Step 6. Data Governance Processes and Documents

a. Develop Data Principles

b. Develop Data Governance Model

c. Formalize Roles and Responsibilities

d. Document the Governance Program

U.S. Department of Transportation
Federal Highway Administration

Step 6a. Develop Data Principles

- **Valuable**: Data is an asset

- **Available**: Data is open, accessible, transparent, and shared

- **Reliable**: Data quality and extent is fit for a variety of applications

- **Authorized**: Data is secure and compliant with regulations

- **Clear**: There is a common vocabulary and data definition

- **Efficient**: Data is not duplicated

- **Accountable**: Decisions maximize the benefit of data

U.S. Department of Transportation
Federal Highway Administration

Step 6b. Develop Data Governance Model
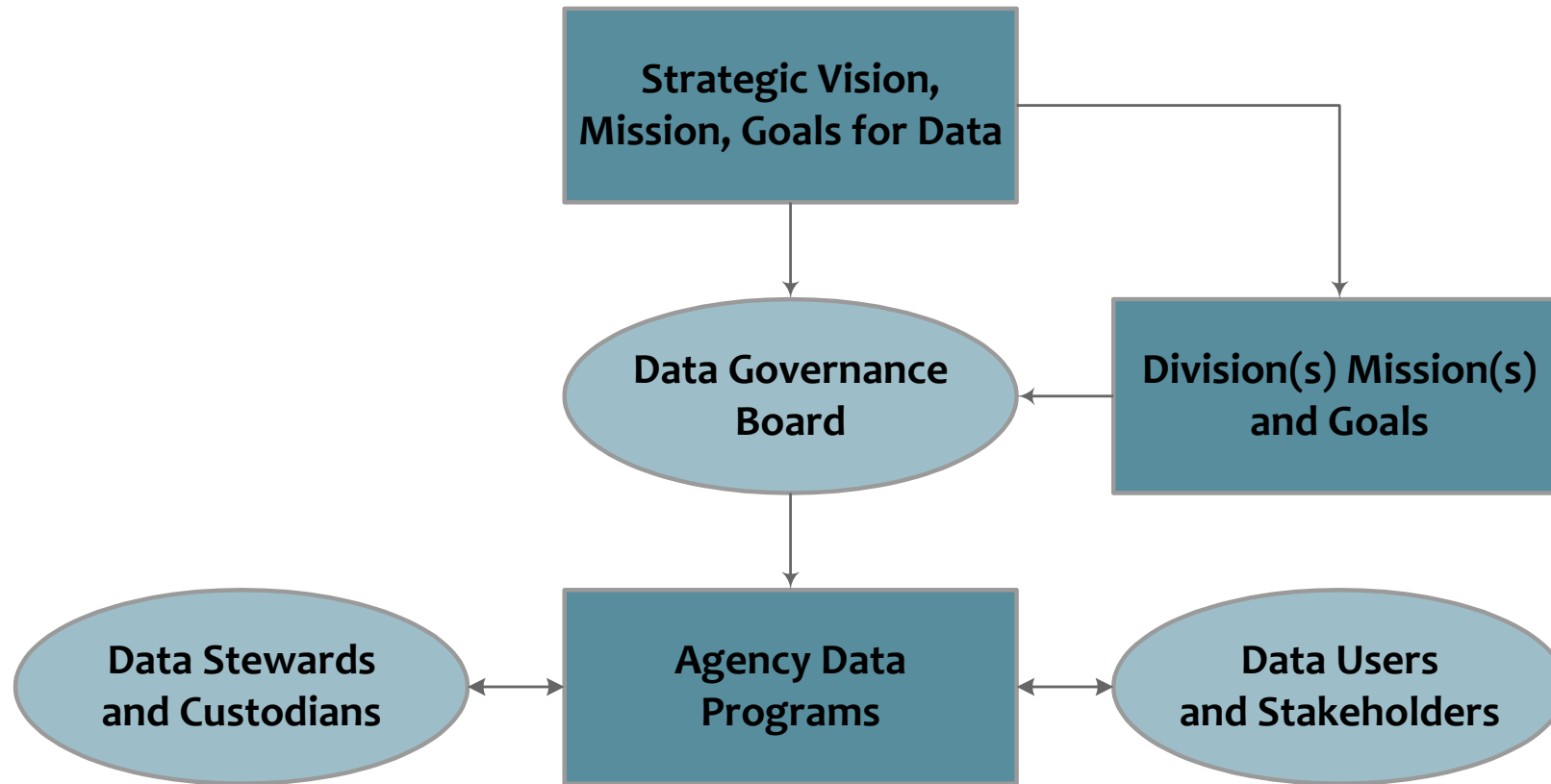
Source: Federal Highway Administration, FHWA-HOP-18-009

Step 6c. Data Governance Roles

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

U.S. Department of Transportation
Federal Highway Administration

34

Step 6d. 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

U.S. Department of Transportation
Federal Highway Administration

Step 7. Data Management Practices

U.S. Department of Transportation
Federal Highway Administration

Step 7. Data Management Practices

- Implement data management policies and procedures for data collection, processing, analysis, and integration.

Data Acquisition	Data Quality	Data Standards
Business Analysis Tools	Data Privacy and Security	Data Storage and Access
Performance Measures	Risk Assessment	Knowledge Management

Step 8. Develop Implementation Roadmap

Step 8. Develop Implementation Roadmap

Step 1: Execute a Memorandum of Understanding
- Execute MOU to engage regional stakeholder agencies in the DBP implementation process

Step 2: Obtain Regional Coordination and Buy-in
- Identify stakeholders
- Implement data governance framework
- Develop and publish a data catalog
- Conduct annual review of mobility data programs
- Develop vendor contract language to enable data sharing

Step 3: Improve Data Integration and Collaboration
- Address needs for data standards
- Address data security and privacy issues

Step 4: Build a Data Sharing Platform
- Post all data in Open Data Format
- Develop Data Governance Manual
- Address data collection and integration
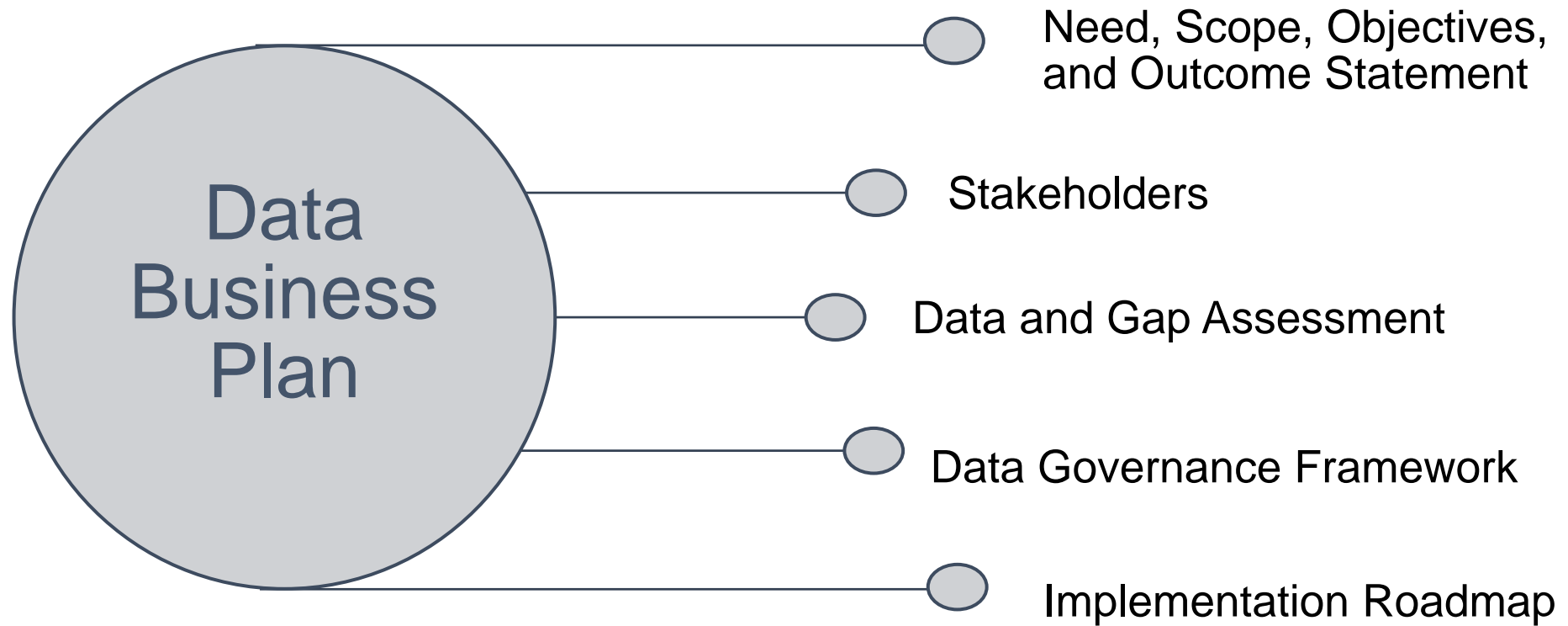- Develop a data warehouse
- Extend/leverage Waze data

Step 5: Implement Performance Measure to Track Success
- Adopt performance measures
- Document measures in Data Governance Manual
- Develop plan for monitoring program activities

U.S. Department of Transportation
Federal Highway Administration

39

Step 9. Develop Data Business Plan

Step 9. Develop Data Business Plan

Data Business Plan
- Need, Scope, Objectives, and Outcome Statement
- Stakeholders
- Data and Gap Assessment
- Data Governance Framework
- Implementation Roadmap

Objectives: At a Glance

- Present FHWA's approach for the Mobility Data Business Plan

- Raise awareness of the benefits of coordinated mobility data management and planning

- Assist in the development of a high-level approaches for Regional Data Sharing Frameworks

- Support the collaborative development of a Regional Data Business Plan that will enable regional data coordination and sharing

- Create data governance framework

- Identify the needs of the region

- Help position regions to better adopt emerging data, including trajectory data

U.S. Department of Transportation
Federal Highway Administration

Outcomes: At a Glance

- Heightened awareness of benefits derived from the implementation of the Mobility Data Coordination Group

- Demonstrated how data management can be enhanced to support Transportation System Management and Operations (TSMO) Plan

- Increased awareness of existing efforts in data collection and management in the regions

- Joint understanding of preliminary approach and the development of schedules for Regional Mobility Data Business Plans

- Agreements on need for Regional Data Sharing Frameworks

U.S. Department of Transportation
Federal Highway Administration

Outcomes: At a Glance (Cont.)

- Agreements on need for a Data Governance Framework

- Established Regional Data Coordination Committees

- Listed action items for next steps – with assigned responsibilities and timeframes

- Agreements on need for Regional Data Sharing initiatives

- Consideration to pooled fund resources for Regional Data Scientist positions

- Documentations of workshops to share with others

U.S. Department of Transportation
Federal Highway Administration

Workshops conducted throughout the country

The current phase of this effort is a series of workshops to:

- Raise Awareness about the benefits of data business planning

- Help spur regional collaboration

- Advance technical ability of workshop participants

U.S. Department of Transportation
Federal Highway Administration

State and Local Workshops - At a Glance

Workshops conducted:

- Atlanta Regional Council (ARC)
- San Diego Association of Governments (SANDAG)
- Nevada DOT
- Wichita Area Metropolitan Planning Organization -WAMPO (Kansas)
- KDOT
- Maricopa Association of Governments – MAG (Phoenix Area)
- Buffalo – Niagara Area

U.S. Department of Transportation
Federal Highway Administration

Beneficiaries of workshops conducted to-date

Atlanta Regional Council (ARC) - May 14, 2019

Invitees (6)

- ARC
- Georgia Department of Transportation (GDOT)
- City of Atlanta
- Georgia Regional Transportation Authority (GRTA)/State Road and Toll Authority (SRTA)
- FHWA Georgia Division
- Georgia Institute of Technology
- Supporting consultants

U.S. Department of Transportation
Federal Highway Administration

Beneficiaries of workshops conducted to-date

San Diego Association of Governments (SANDAG) - Nov 21, 2019

Invitee (1)

- SANDAG

Key takeaways from FHWA DBP Pilots include:

- Program Manager is key – someone to coach, influence others, work with change in management, identify bottlenecks and resolve them
- Setting goals is critical
- Don't neglect vital yet less "flashy" initiatives: developing a data catalogue, establishing standards, determining naming conventions, mapping data roles for each dataset

Beneficiaries of workshops conducted to-date

Nevada DOT (NDOT) - February 17, 2020

Invitees (5)

- Nevada DOT
- Regional Transportation Commissions (RTC) North
- RTC South
- FHWA Nevada Division
- Supporting consultants

U.S. Department of Transportation
Federal Highway Administration

Beneficiaries of workshops conducted to-date

Wichita Area MPO (WAMPO) – Oct. 6 and Oct. 27, 2020

Invitees (6)

- WAMPO

- KDOT

- City of Wichita

- City of Derby

- City of Haysville

- FHWA Kansas Division

U.S. Department of Transportation
Federal Highway Administration

Beneficiaries of workshops conducted to-date

Kansas DOT (KDOT) - November 2, 2020

Invitees and Challenges

- Attendees:
  - KDOT Central Office
  - KDOT Local District offices

- Challenges:
  - Data Governance initiatives started but didn't get traction
  - Staff turnover
  - Data collection techniques not up-to-date
  - Need for good data analysis knowhow

U.S. Department of Transportation
Federal Highway Administration

Beneficiaries of workshops conducted to-date

Maricopa Association of Governments (MAG) - Dec 10, 2020

Invitees (6)

- MAG staff
- Members of multiple transportation technical committees of MAG and MAG Public Universities Task Force
- FHWA Arizona Division
- Arizona DOT
- Maricopa County DOT
- Valley Metro

Beneficiaries of workshops conducted to-date

Buffalo – Niagara Workshop - March 19 and 26, 2021

Invitees (16)

- Greater Buffalo-Niagara Regional Transportation Council (GBNRTC)
- Niagara International Transportation Technology Coalition (NITTEC)
- New York State DOT (Albany Office and Region 5)
- New York State Thruway Authority
- Erie County
- Niagara County
- City of Buffalo
- City of Niagara Falls

U.S. Department of Transportation
Federal Highway Administration

Beneficiaries of workshops conducted to-date

Buffalo – Niagara Workshop Invitees (Cont.)

- Town of Amherst
- Town of Cheektowaga
- Town of Tonawanda
- Niagara Frontier Transportation Authority
- Ministry of Transportation of Ontario
- Niagara Falls Bridge Commission
- Peace Bridge Authority
- University at Buffalo

U.S. Department of Transportation
Federal Highway Administration

For Additional Information

Walter During, PE

Transportation Specialist

FHWA Office of Operations

Walter.during@dot.gov

Tel: (202) 366-8959