Transportation Asset Management and Data Business Planning

Making MAP-21 Requirements Work Effectively

Florida Transportation Data Symposium

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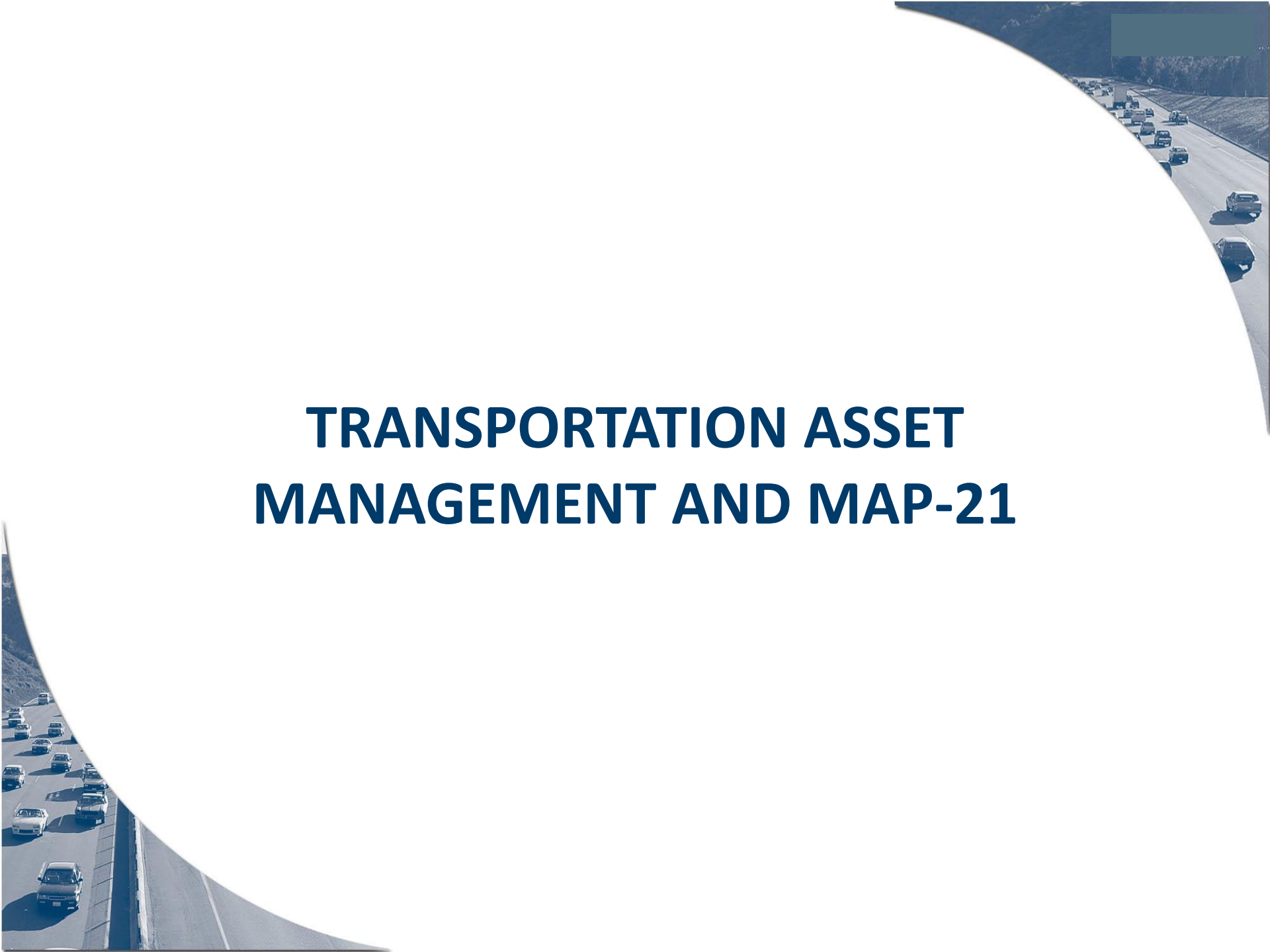
Overview

- Data as an Asset
- Transportation Asset Management and MAP-21
- Florida's TAMP
- A Case for Data Business Planning
- Bringing it all Together

DATA AS AN ASSET

Data has unique features

- Ownership is dispersed throughout organization
- Often housed in silos (cylinders of excellence)
- Substantial resources committed to upkeep and maintenance
- Access and granularity are dependent on uses and reporting requirements



TRANSPORTATION ASSET MANAGEMENT AND MAP-21

Federal Requirements of MAP-21

- Develop a Risk Based Transportation Asset Management Plan
- National performance measures for bridges and pavements
- Rulemaking process underway
  - Expected rules by beginning of 2016

Federal Requirements of MAP-21

- Minimum Requirements for a TAMP
  - Inventory of NHS pavements and bridges
  - Defined asset management objectives and measures
  - Identified performance gaps
  - Lifecycle cost and risk management analysis
  - Financial plan
  - Investment strategies (10 year basis)
- Rely on quality data and information on business processes

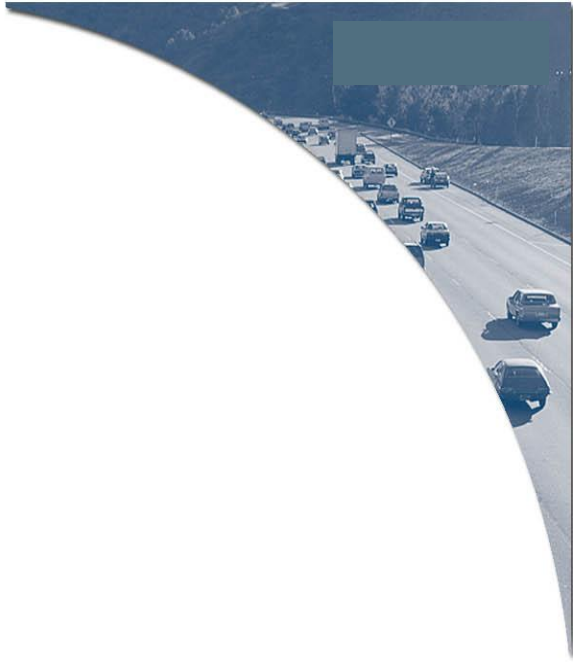
Federal Requirements of MAP-21

- Proposed Minimum Condition Thresholds
  - Bridges
    - Less than 10% of total bridge deck area classified as structurally deficient
  - Pavements
    - Based on IRI
    - Percentage of pavements in “Good” condition
    - Percentage of pavements in “Poor” condition

NOPR for Performance Measures

- "FHWA proposes measures that would be applicable to all mainline Interstate System and non-Interstate NHS pavements regardless of ownership or maintenance responsibility of roads within a given State or metropolitan planning area."

- "FHWA proposes measures that would be applicable to all NHS bridges regardless of ownership or maintenance responsibility within a given State or metropolitan planning area including bridges on ramps connecting to the NHS and NHS bridges that cross a State border."

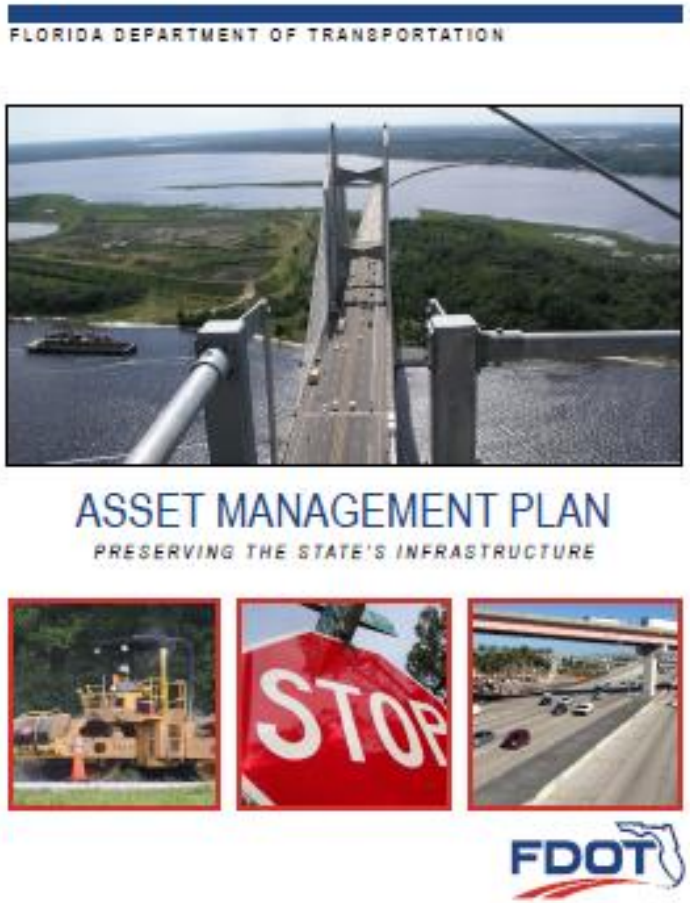


FLORIDA'S TAMP

TAMP – A Brief Version

- Clear and concise

- Table of Contents
  - 1.0 About this Plan
  - 2.0 Inventory and Condition
  - 3.0 Performance-Based Planning a Programming
  - 4.0 Asset Management Tools
    - Management Systems
    - Risk
    - Life Cycle Assessments
  - 5.0 Financial Plan
  - 6.0 Implementation



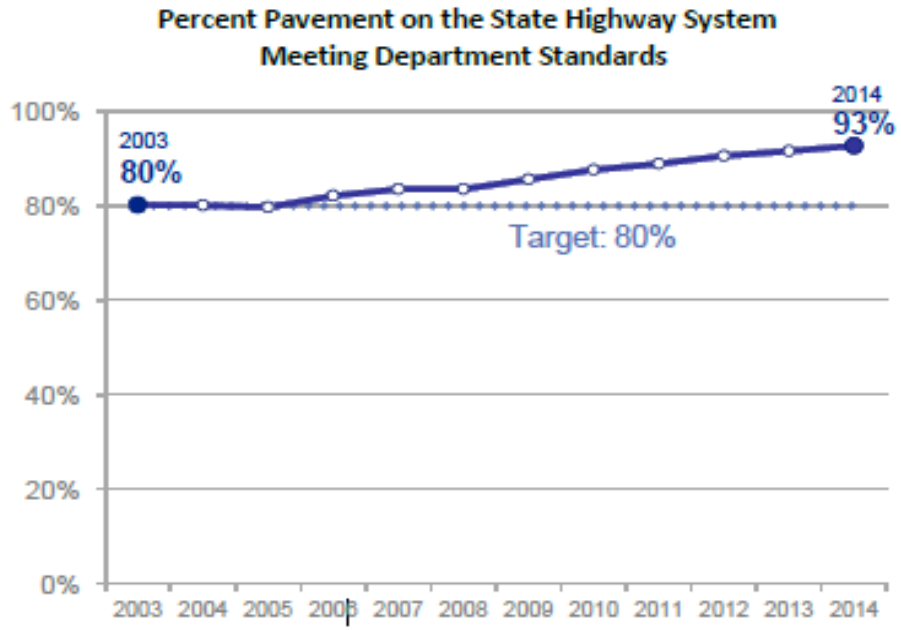
Objectives and Performance

Overarching Asset Management Objectives:

- Achieve and maintain a state of good repair for transportation assets for all modes
- Reduce the vulnerability and increase the resilience of critical infrastructure to the impacts of extreme weather and events
- Minimize damage to infrastructure from transportation vehicles

Pavement-Related Asset Management Objectives

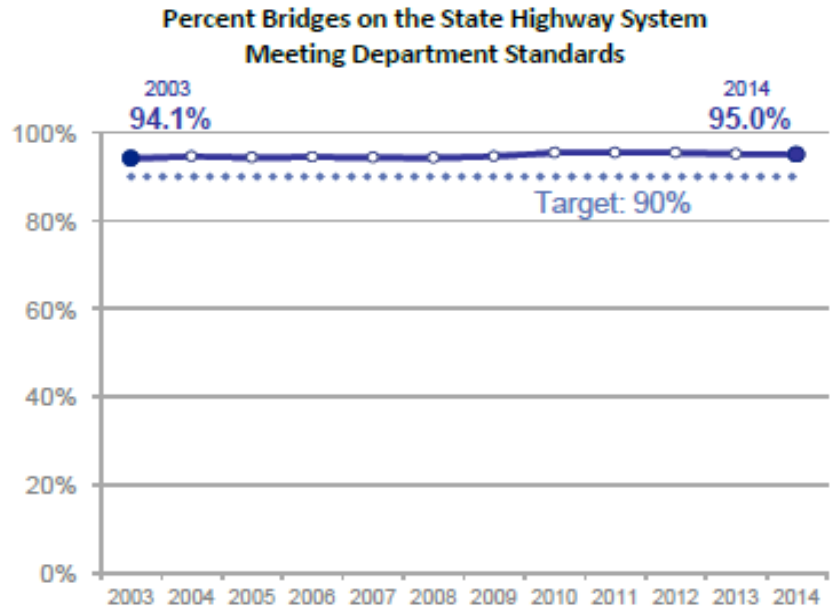
- Pavement Condition: For 80 percent of all lane miles on the State Highway System have a Pavement Condition Rating of either “excellent” or “good.”



Bridge-Related Asset Management Objectives

Bridge Condition:

At least 90 percent of all bridge structures on the State Highway System having a condition rating of either “excellent” or “good”



Restricted Bridges:
No more than one percent of all bridge structures on the State Highway System with posted weight restrictions.

Pavements

	SIS Centerline Miles	SIS Lane Miles	NHS Centerline Miles	NHS Lane Miles	SHS Total Centerline Miles	SHS Total Lane Miles
State owned (includes interstates)	4,294	18,678	8,203	33,708	12,118	43,665
Locally owned	59	221	567	2,427		
Total	4,353	18,899	8,770	36,135		

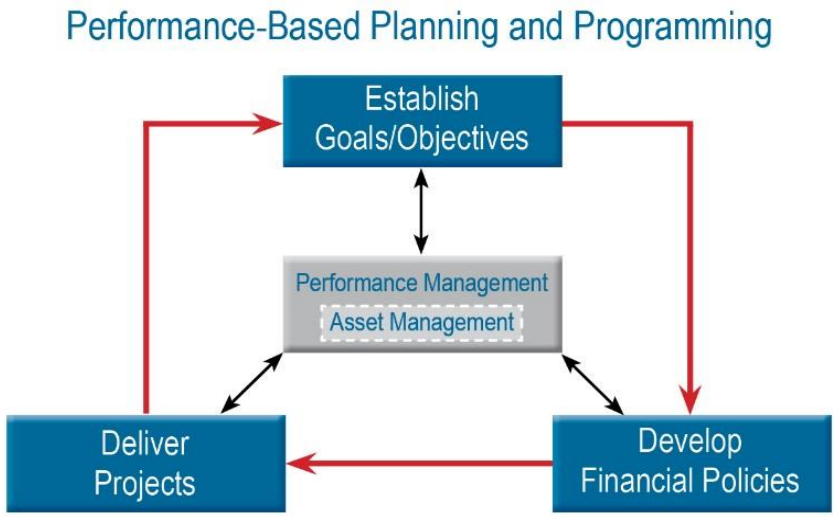
As of June 30, 2015

Bridges

	Number of Bridges	Deck Area (ft^2)	SD Area (ft^2)	Percent of Area SD
SIS	4,509	93,116,588	615,445	0.7%
State-Owned NHS	4,220	96,125,304	1,831,101	1.9%
Locally-Owned NHS	1,488	26,484,291	482,284	1.8%
State-Owned Total	5,441	122,600,774	2,890,234	2.4%
NHS	5,708	122,609,594	2,313,385	1.9%
Florida NBI	12,070	172,941,567	4,194,739	2.4%

Existing Tools and Processes

- Financial Processes
- Pavement Management System and FAST
- AASHTOWare Bridge
- Life Cycle Cost
- Risk Management / Risk Mitigation Activities




FDOT PROCESSES AND KEY DOCUMENTS
Coordination with Partners and Stakeholders
Policy
Planning
Program Development**
Implementation
Performance Management
Asset Management
Program Planning Workshops
Florida Transportation Plan (FTP)
SIS* Multimodal Unfunded Needs Plan
SIS 10-Year Plan
SIS Cost-Feasible Plan
Tentative 5-Year Work Program
General Appropriations Act
Adopted 5-Year Work Program and Financed Program and Resource Plan
Construction, Maintenance, and Project Implementation
5-Year Finance Plan and Cash Forecast
Legislative Budget Request
10-Year Program and Resource Plan
Long-Range Program Plan
Modal Plans Corridor Plans Authority Plans
District and Turnpike Work Programs
MPO Long-Range Transportation Plans
MPO TIPs and Priority Lists
* SIS = Strategic Intermodal System
** A Program and Resource Plan, Finance Plan, and Cash Forecast are created with every version of the Work Program to ensure the Program is financially viable. Development of the Operating Budget and FCO Buildings and Grounds Budget not shown to simplify this illustration.

Maintenance Objectives

- Achieve at least a 80 maintenance rating on 100% of the SHS

- Information from FDOTPerforms

WHY CONSIDER DATA BUSINESS PLANNING?

As transportation choices become more complex, the challenge to supply useful, timely and understandable data and analyses to inform transportation choices becomes even greater. At the same time, budget pressures can make it difficult to sustain essential data programs."

Deb Miller, former KDOT secretary

Definition of Transportation Asset Management Information System (TAMIS)

- "A collection of **hardware, software, data, and processes** that support asset management business processes."
  - Collects, processes, stores, analyzes information about assets
  - Develops sound maintenance and rehabilitation strategies
  - Schedules, tracks, manages work

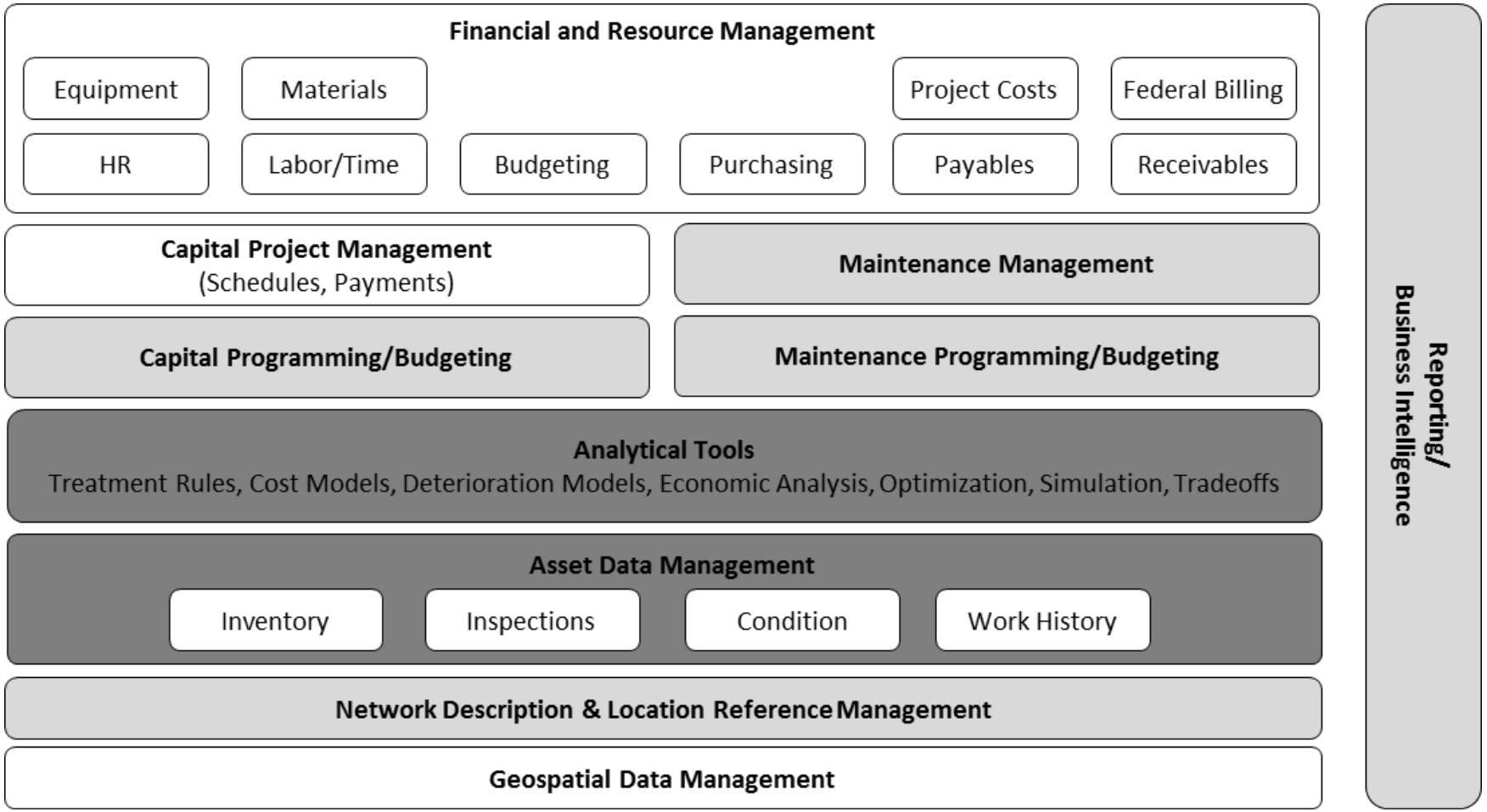
Functional Components of TAMIS

- Asset inventory
  - Maps, images, photographs, video, construction plans
- Asset condition, performance, utilization tracking
- Prediction of condition and performance
- Treatment selection and life cycle management
- Resource allocation
- Work planning and tracking support

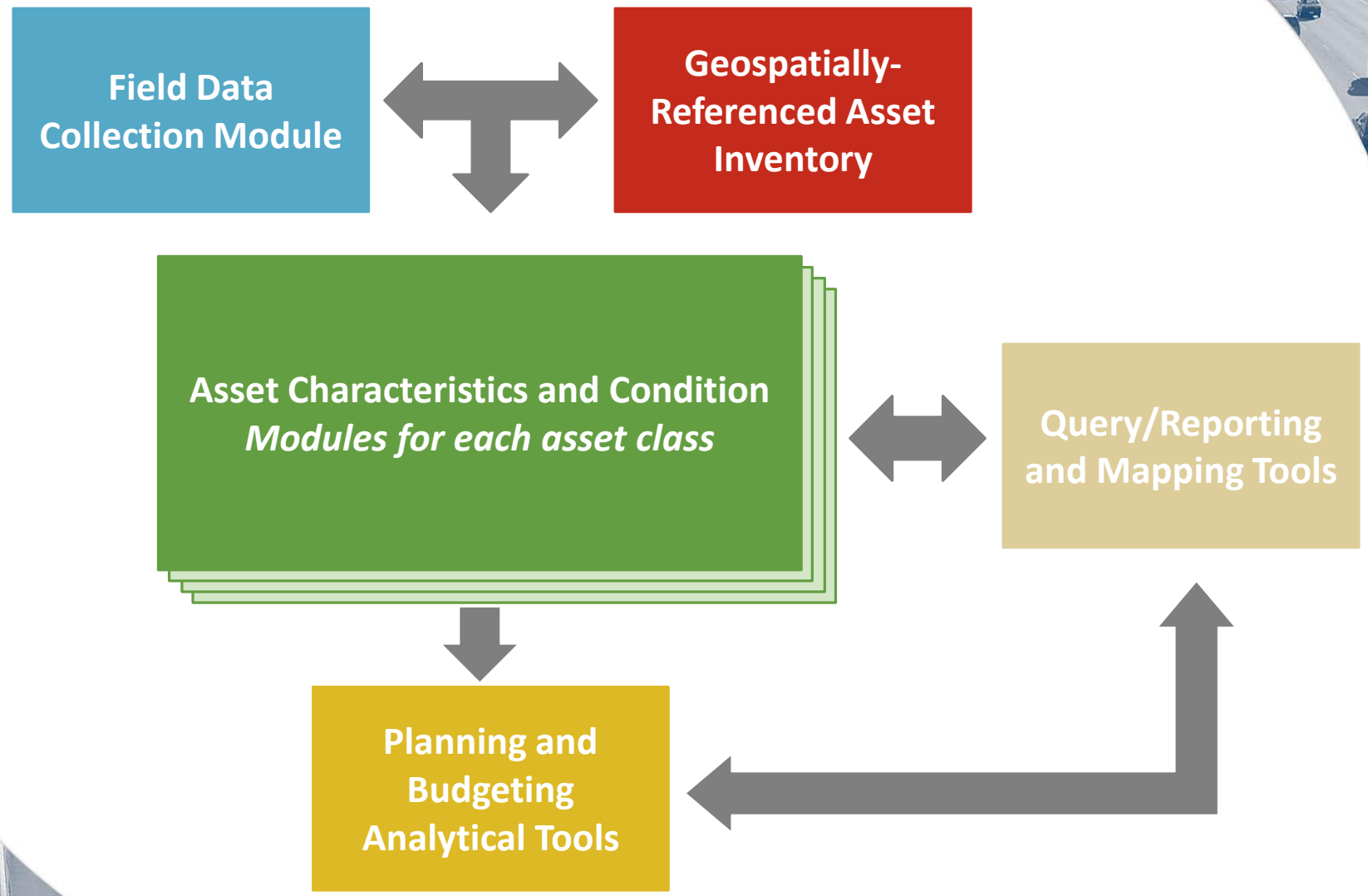
Technical Components of TAMIS

- Database
  - Support for multiple database types - Links to geospatial features
- Application software
  - Upload, export, view, edit data
  - Run analyses, perform queries, produce reports
- Interfaces
  - Enterprise Resource Planning (ERP) systems
- Field Data Collection System (mobile access)

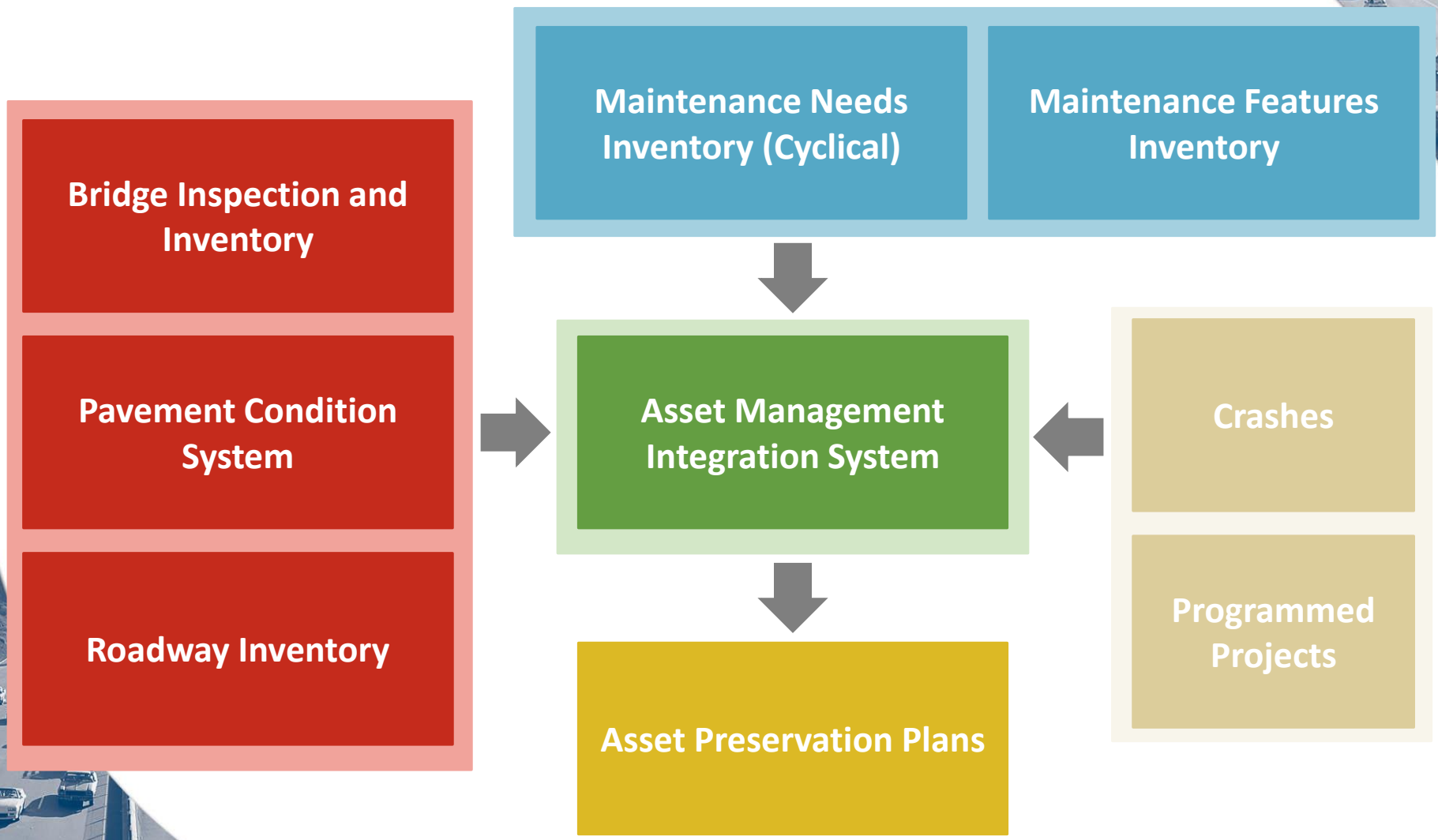
Example Scope From AASHTO Guidance



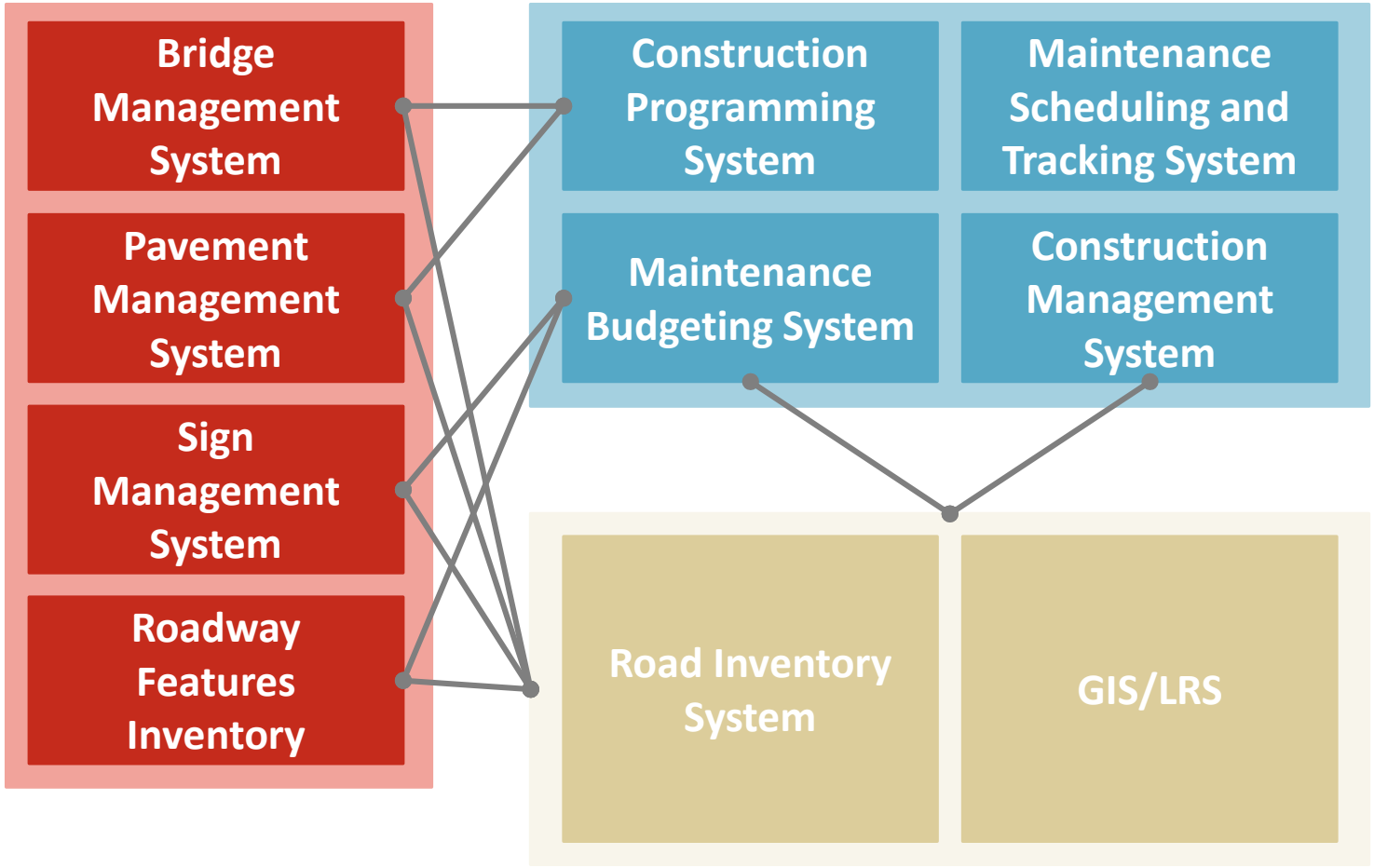
TAMIS Model 1 – Fully Integrated, Self-Contained



TAMIS Model 2 – Asset Management Planning Tool with Data Feeds



TAMIS Model 3 – Separate Management Systems with Interfaces



ADOT&PF TRANSPORTATION ASSET MANAGEMENT INFORMATION SYSTEM

TAMIS Vision

To provide a long term, systematic approach to cost-effectively sustain ADOT&PF infrastructure

TAMIS Goal

A TAMIS that meets the needs of stakeholders by integrating data and establishing institutional methods to ensure that integration results in improved decision making for TAM

TAMIS Timeframe

Under development. Project will be completed September 2014

Fleet Condition Survey | Shore Condition Survey | eDOCS | GMPAS | Transit & Rail | ADA Inventory

EMS | IRIS (2015) | FAAM | RWIS | PONTIS (BrM 5.2 2014) | WIM Data Port

Data Sources

Provides data on programs and assets

Local Permits | MMS | MMS Inventories | MRS | PMS | AASP

Airport PMS | PETS (part of COGNOS) | Geotech Assets | CRASH | Roadway Data System | Traffic Server

Asset Inventory | Asset Condition | Work History | Programs and Budgets

TAMIS

Business processes and integration tools to turn data into information

Converts data to information

Brings decision makers together

Provides decision makers with access to data

Integrates data

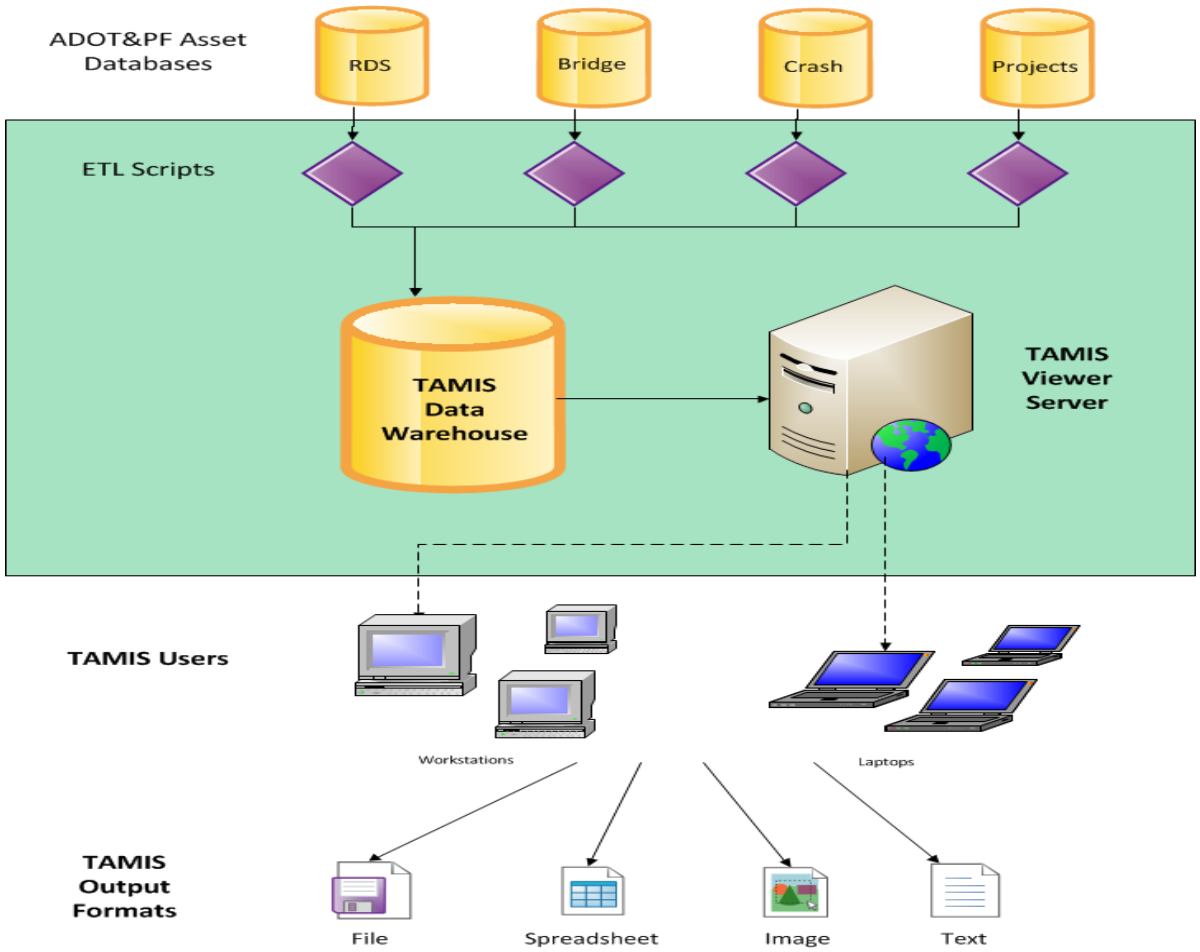
Predicted Future Performance | Investment Scenarios | Work Recommendations

Asset Management Decisions

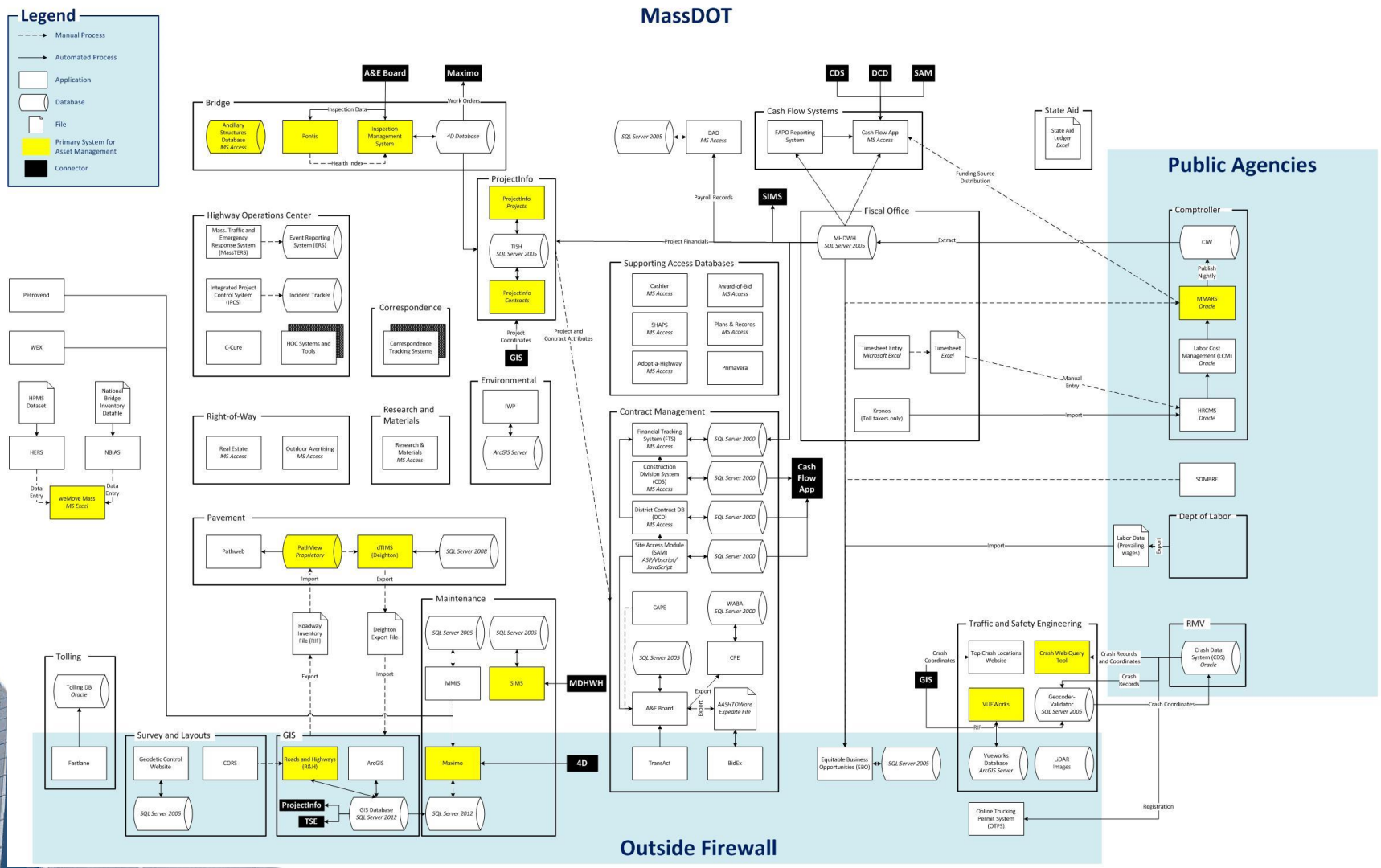
Promote wise investment of resources, credibility, and transparency

For more information, contact Carolyn Morehouse at **carolyn.morehouse@alaska.gov, (907) 465-8140**

Alaska Implementation Plan – Tool Architecture

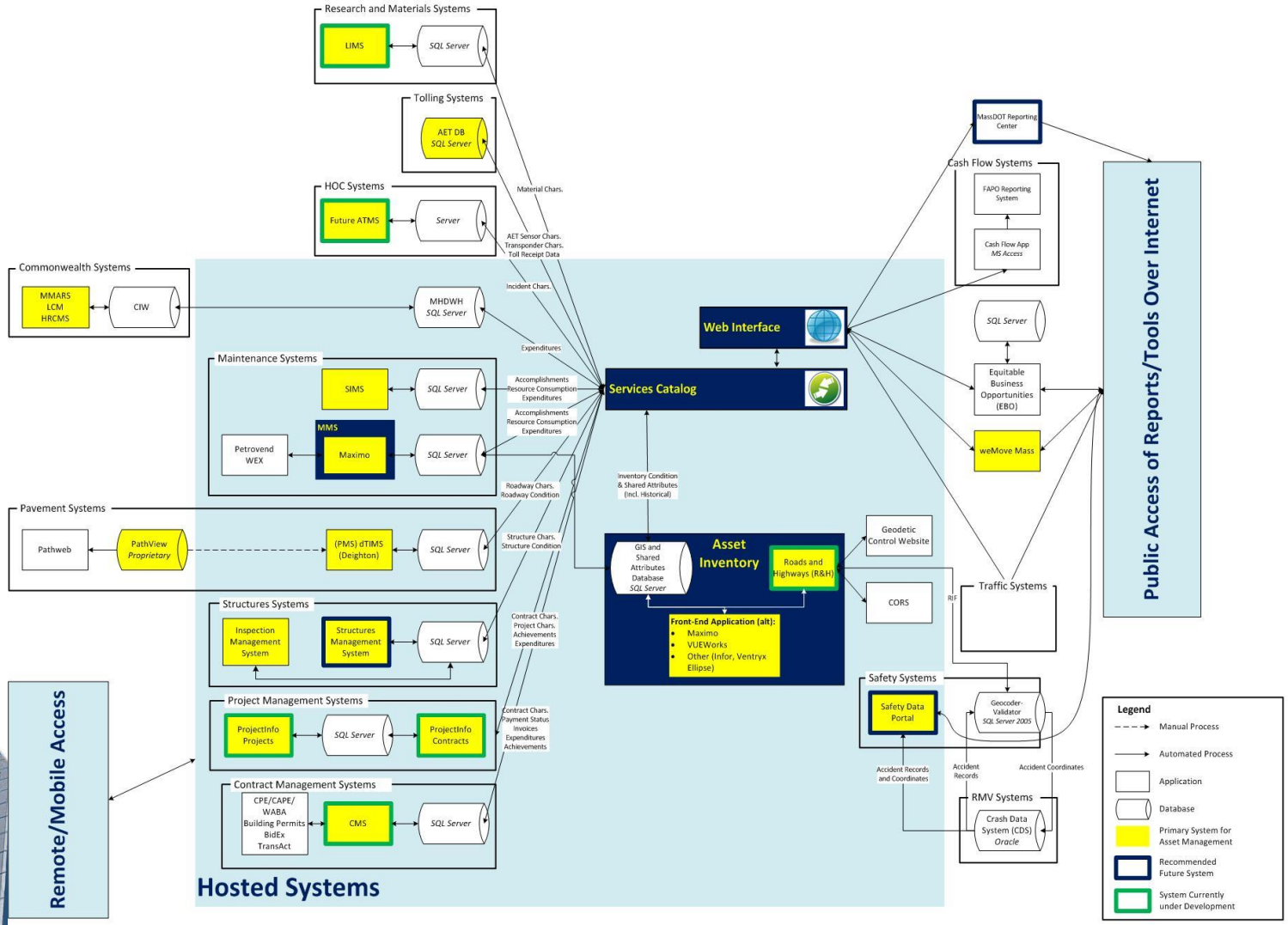


MassDOT AM Strategic Plan
Technical Architecture
From this… (Current System Map)



Technical Architecture

To this… (Service-Oriented Vision)



Data Business Plan - What

Goals of TAMIS DBP

1. Improve coordination and communication across ADOT&PF offices (reduce redundant or uncoordinated efforts between offices)
2. Define data business plan framework
3. Identify issues/challenges in managing and sharing asset data at ADOT&PF
4. Serve as prototype for enterprise
5. Provide Action Plan for addressing issues/challenges

Data Business Plan - Why

System challenges

- Data Collection (missing data, or too much data collected that is never used, standards are needed)
- Storage Systems (wide variety of storage systems impacts ability to integrate data)
- Data Quality (varying degrees of data quality exists)
- Documentation (minimal or no documentation exists for many systems)
- Reporting Needs (additional reports needed)
- Silo Systems (inhibit ability to integrate data)
- System Access (may be difficult to access system in remote areas or access is controlled by certain offices)

Data Business Plan - Why

Technical Challenges

- Need more efficient ways to locate and take advantage of available data and information
- Need better methods to look at and integrate data from multiple sources
- Need (business) processes and systems that reduce redundancy and promote consistency in data results
- Need department-wide spatial data tools
- Need System Interfaces (automated interfaces needed between systems)
- Need better links to Geospatial Data (necessary to simplify integration of data that is based on location)

Data Business Plan - Why

Institutional Challenges

- Business rules needed (to ensure timely update of data and accessibility of data across offices)
- Governance needed for management of TAMIS systems (this need applies to ALL ADOT&PF systems)
- Information to decision-makers (can be improved through use of Data Governance)
- Need to define system ownership, stewardship roles/responsibilities
- Limited resources (careful planning needed to allocate resources to most critical areas)
- Limited appreciation by decision-makers of the role of data systems in supporting business operations
- Lack of formal policies and standards which guide the collection, processing, and use of data within the organization

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES		POLICY AND PROCEDURE NUMBER 02.03.040	PAGE 1 of 5
Policy and Procedure		EFFECTIVE DATE PENDING	
SUBJECT **Data and Information Systems Governance**		SUPERSEDES **New**	DATED
CHAPTER **Administration**	SECTION **Information Systems**	APPROVED BY DRAFT	

PURPOSE

This formalizes the policy and procedure (P&P) of the department for management of data and information systems.

This P&P establishes a structure for developing, approving and managing standards, procedures and manuals to ensure consistency across the department. Therefore, reliable and timely data and information are easily accessed, shared for analysis and integrated into the department's decision-making processes at the regional and statewide levels. The information systems used to support decision-making serve as repositories of high-quality data that can be retrieved efficiently in a cost-effective and user-friendly manner.

POLICY

It is the policy of the Department of Transportation and Public Facilities (DOT&PF) to follow a standard framework and procedure for the acquisition and management of data and information systems supporting business processes that are aligned with the department's strategic goals. The integration and coordination of Information Technology (IT) systems and data with business processes is critical to the department.

PROCEDURE

Definitions

Data: A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or computers.[1]

Data Management: The development execution and oversight of architectures, policies, practices and procedures to manage the information lifecycle needs of an enterprise in

[1] Glossary of Document Technologies, (ANSI/ANSII, TR2-1998)

http://www.dot.state.ak.us/admsvc/pnp/policy_and_procedures.shtml#02

A Vision for Asset Management at MassDOT

MassDOT will **effectively communicate to the public, executives, and the legislature** the value of proactive maintenance and preservation to minimize whole life costs.

MassDOT will accomplish this using a suite of **fully integrated, fully accessible systems** built on a foundation of high-quality data.

Strategic Goals

Business

- **Document and enhance business processes** to make consistent and forward-thinking decisions
  - Collect data on a GIS backbone
  - Make data-driven, objective decisions regarding maintenance, preservation, and capital investments

Functionality

- **Improve system functionality** to get the most use out of each system
  - Asset management applications help the business make data-driven decisions

Strategic Goals

Data

- **Properly govern data**
  - Maximize the use of system functionality
  - Allow the business to make data-driven decisions

Technical Architecture

- **Modernize technical architecture** using a service-oriented architecture (SOA)
  - Simplify data exchange
  - Enhance performance of applications
  - Enable more rapid system enhancements

MassDOT Data Governance

Need for Data Governance

MassDOT Asset and Data Catalog

- Asset Class
- Asset
- Asset owner (business)
- Data elements
- Name of System in which Data resides
- System owner (IT)
- Data owner (Business)
- Defines System of Record

MassDOT Data Governance Manual

1. Introduction
   - Definitions, authority, roles and responsibilities, principles

2. Data Governance Structure

3. Data Standards

4. Data catalog and update standards

5. Data Dictionary update standards

6. Data system acquisition processes (prioritization of projects)

RESOURCES AND CONCLUSION

Resources & Associated Research

- Data Governance & Data Management
  - NCHRP 666: Target-Setting Methods and Data Management to Support Performance-Based Resource Allocation by Transportation Agencies
  - NCHRP 706: Uses of Risk Management and Data Management to Support Target-Setting for Performance-Based Resource Allocation by Transportation Agencies
  - NCHRP 20-90: Improving Management of Transportation Information

Conclusions – Why Consider Data as an Asset?

- Need to address quality and access issues of data housed in multiple source systems
- Transition from data to information
- Connect decision makers who use information to agency staff who collect and process the data
- There is no single, correct way to integrate data from multiple systems for TAM

THANK YOU