



Implementing the Massachusetts TAM Strategic Plan



presented to

2016 AASHTO Asset Management Conference

presented by

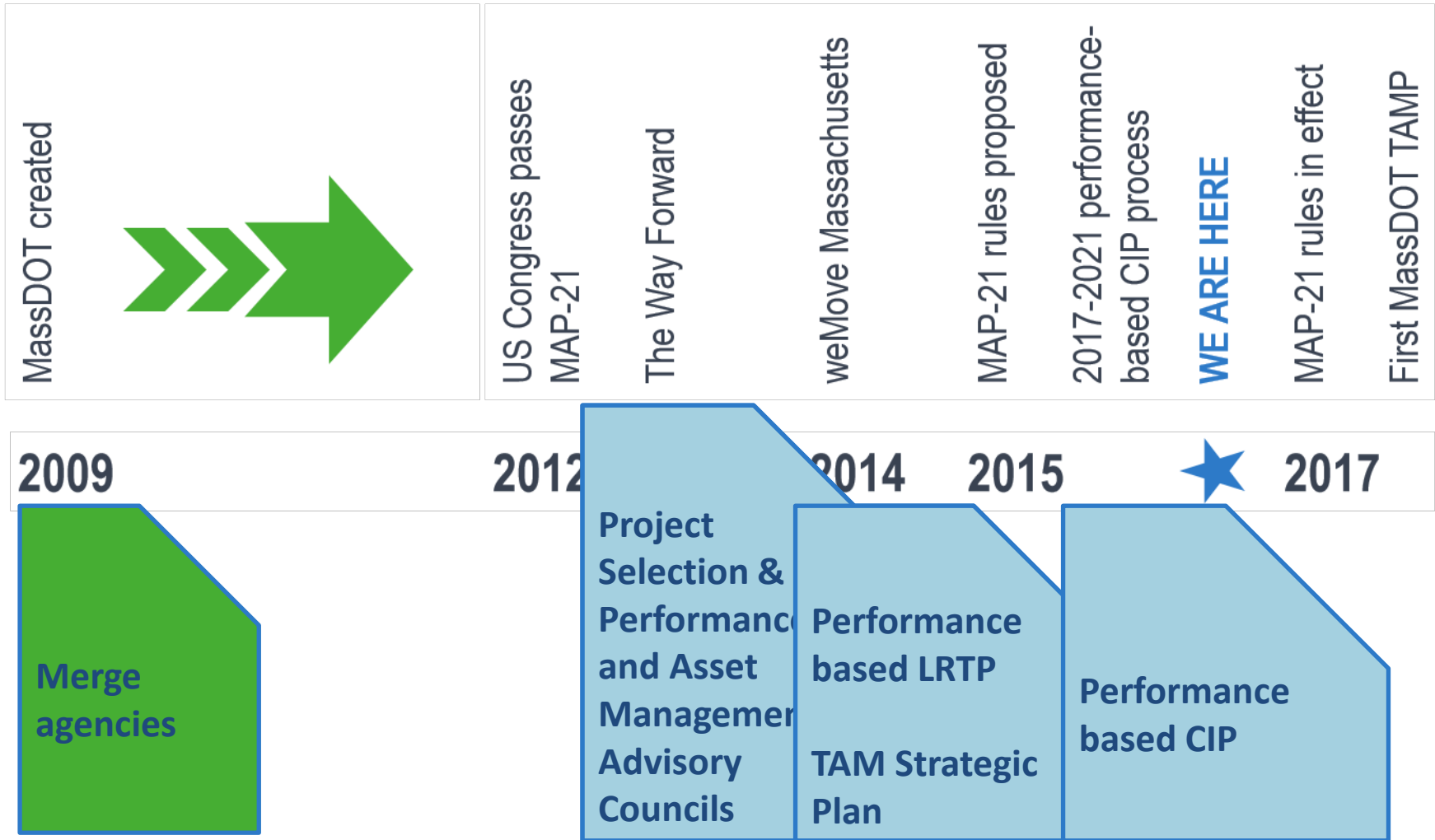
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Context for Performance Based Planning





THE TAM STRATEGIC PLAN

Overview

Setting Goals, Objectives and Strategies



Establishing an Enterprise Philosophy



Putting it Into Practice



On Reflection...



SETTING GOALS, OBJECTIVES, AND STRATEGIES

The Strategic Plan Process

Identify Best Practices

Document Business Needs

Document Current State

Assess Gaps

Develop the Strategic Plan

IMPLEMENT

Products of the Strategic Plan

- Recommendation for Hosting
- Technical Architecture
- Data Collection Strategy
- Data Governance
- Dashboards and Reports
- Program Governance
- Data Dictionary and Catalog
- High Level Data Flows

Goal: Collect, update, and share asset management data adhering to an adopted data governance policy

Strategy L: Have a data governance policy that covers high quality data and documentation.

MassDOT should develop a Data Governance Manual adhering to standards for data assets, systems, and assets. The manual should include:

- Introduction defining the goals for data governance, authority for the manual, roles and responsibilities, processes, and to whom the manual applies.
- Data Governance Structure defining the organizational structure used to develop and maintain the manual.
- Data Standards defining
 - naming conventions,
 - how to locate assets,
 - how to minimize paper and electronic files,
 - use of business intelligence tools
 - Reference and Master Data management
 - Content/Records management
 - Security
- Datastore and device access.
- Data Catalog defining the format.
- Data Dictionary defining the format.
- Data System Acquisition Process defining a consistent system project presentation process.

As it implements new systems, MassDOT should develop system documentation following a consistent format and make it available to all personnel.

Strategy L: Actions, Timeline, and Dependencies

Action	Timeline	Dependencies
1 Develop Data Governance Manual	Immediate	
2 Develop Data Dictionary	Year-Term 1	1
21 Draft system documentation for new systems	Year-Term	

Strategy M: Populate appropriate inventories for all assets.

MassDOT should develop and keep the inventory and condition up to date:

- The initial inventory data for above ground assets should be populated using UTM data collected as part of the sign-inventory effort.
- The initial inventory data for below ground assets should be populated manually.
- Initial condition data for above ground assets should be populated using pavement right of way (ROW) sensors.
- All inventory and condition data for all assets should be checked for quality during manual inspection, and
- Ongoing inventory and condition should be updated using automated connections to As-Built drawings from permitted building and construction and the maintenance management system.

Strategy M: Actions, Timeline, and Dependencies

Action	Timeline	Dependencies
1 Develop Data Governance Manual	Immediate	
2 Develop Data Dictionary	Year-Term 1	
26 Develop asset inventory system	Immediate	
27 Develop initial inventory and condition dataset	Immediate 1, 2, 3	

Strategy N: Provide access to accurate project data.

Having accurate project data is critical for making asset management decisions. MassDOT will build on Strategy O (Developing a standard for building maintenance work) and adhere to the Data Governance Manual to ensure that high quality project data are collected and used by all personnel. To accomplish this, MassDOT will:

- Ensure that the near-time Attendance System Data time by asset, automatically pulling data on project phases and representation.
- Ensure that all systems for producing and dealing project costs (i.e., CMR, CMR CARD) adhere to the Data Dictionary structure defined in the Data Governance Manual.
- Projects should
 - include forced workflows so that project data are kept updated throughout the entire project development life cycle.
 - include revised project categories that align with data from maintenance, contract, and permitted work logging systems.

● Include revised project categories that include enough detail to allow for reporting on specific and suborder facilities and other measures in support of MOU data policies.

● Be available to all MassDOT personnel at all locations and all times, notifying systems when the need arises.

Strategy N: Actions, Timeline, and Dependencies

Action	Timeline	Dependencies
28 When implementing new and Attendance and Projects, ensure data are fresh and properly integrated	Immediate	
2 Update Data Dictionary	Immediate 1	

Strategy O: Communicate data needs with other State agencies.

Ongoing communication and collaboration with other agencies will enhance MassDOT's public perception and enhance its ability to request more funds for system innovation. The Highway Division will:

- Continue to work with the Registry of Motor Vehicles and other stakeholders to improve the location and content of safety data. Asset managers use this data to identify whether they are required to perform road safety audits as part of their

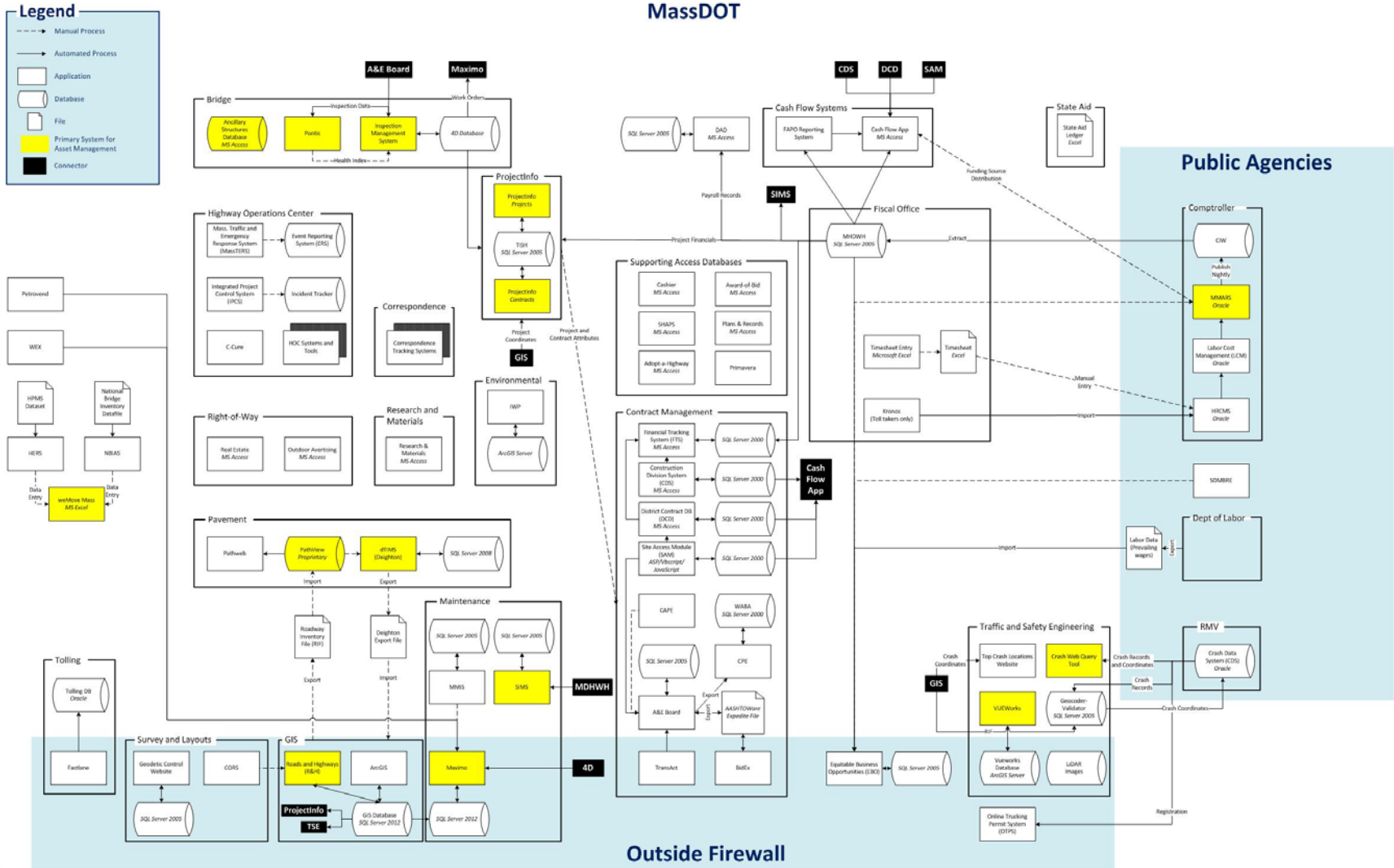
Strategy O: Actions, Timeline, and Dependencies

Action	Timeline	Dependencies
29 Continue to work with the RMV to improve the location and content of safety data	Immediate	

Goal: Modernize IT technical architecture and application selection processes to support

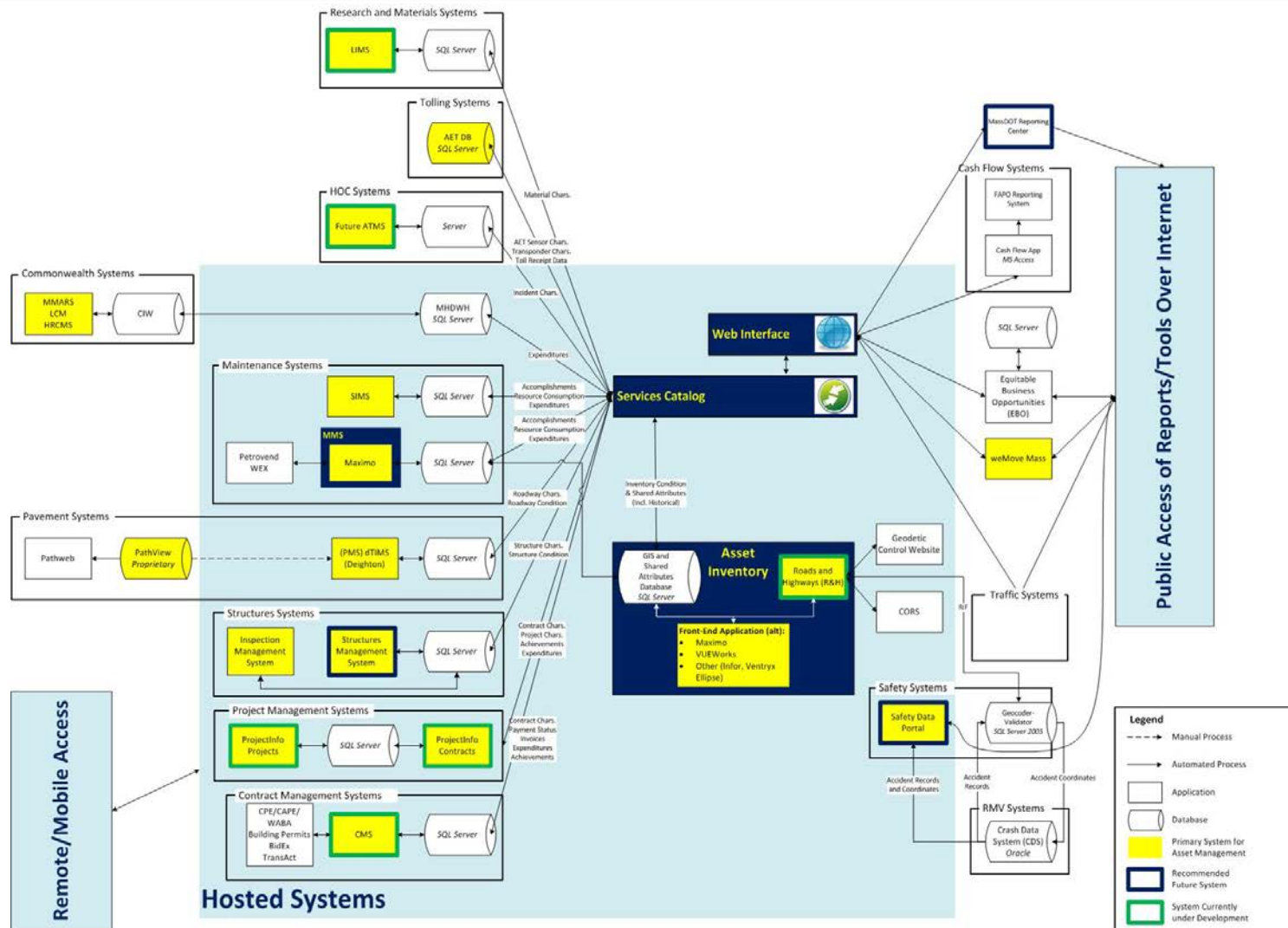
Products of the Strategic Plan

From this... (Current System Map)



Products of the Strategic Plan

To this... (Service-Oriented Vision)



The Vision

MassDOT will manage **the full life cycle** of its assets using fiscal constraint and **future performance** to make capital and maintenance decisions.

MassDOT will **identify and mitigate risks** to minimize the impact of program, project, and external unknowns on asset condition.

The Vision

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



ESTABLISHING AN ENTERPRISE PHILOSOPHY

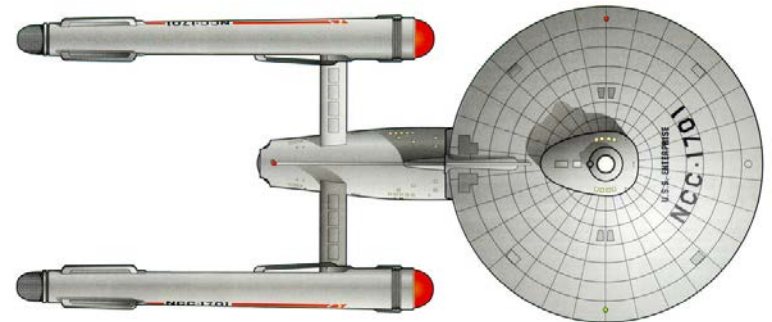
An Agency-Wide Perspective

Silo



What business processes work for me, in my District?

Enterprise



What processes work for all Districts?
What processes work for Boston?

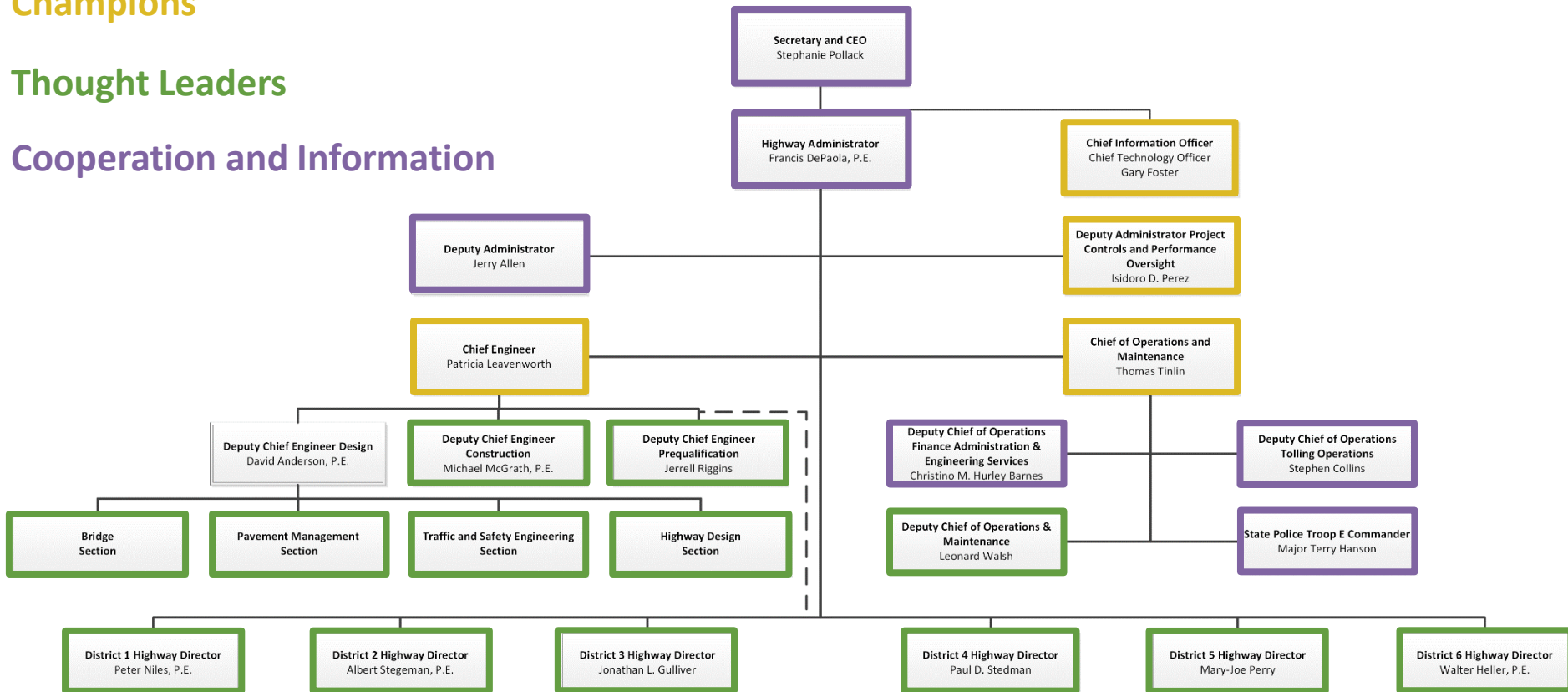
Cross-Enterprise Collaboration

Implementing Asset Management Requires...

Champions

Thought Leaders

Cooperation and Information



Technical Working Groups

Policy Advisory Group

Executive-level champions

Make policy decisions

Review TWG work and coordinate

Business Process and Asset Reporting

Construction, Design, Fiscal, Districts

Review, document, and revise TAM business processes

Asset Information Portal

IT professionals and data stewards

Develop clearinghouse website for TAM materials

Technical Working Groups

Inventory and Asset Data

Planning, Districts, Traffic and Safety, Env.

Establish data collection and governance

Review GIS systems and protocols

Maintenance

Districts and Boston Maintenance

Establish standard maintenance measures

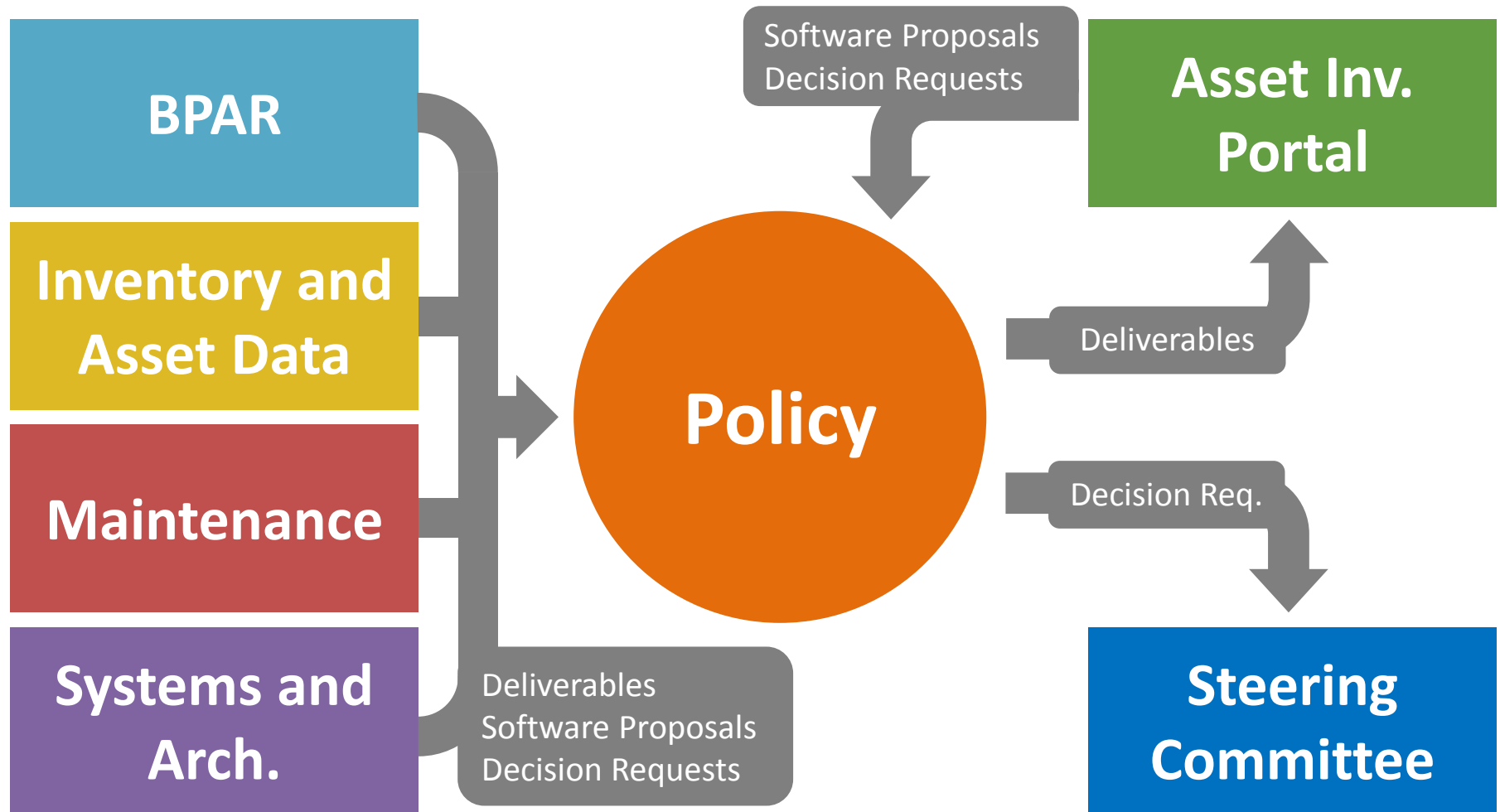
Systems and Architecture

IT, Pavement Management, Bridge

Promote Service-Oriented Architecture

Build collaboration between business/IT

Interactions





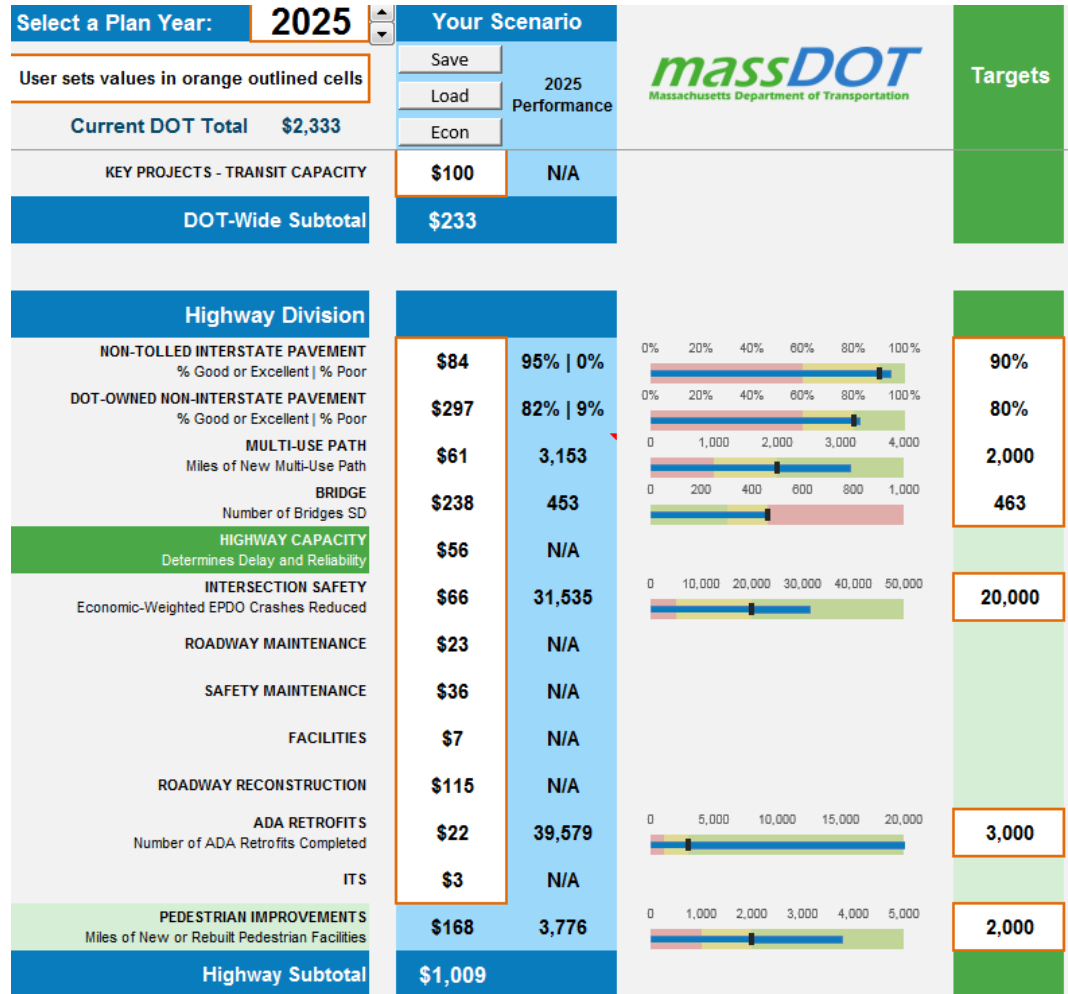
PUTTING IT INTO PRACTICE BUILDING A CAPITAL PLAN

Cross-Program Tradeoffs

» Multimodal cross-asset allocation tool

– Pavement, bridge, safety, mobility, bicycle, pedestrian, signals, etc.

» Respects the color of money





PUTTING IT INTO PRACTICE LIGHTING A FIRE

The Pothole Collector

- **Prototype**

- ❖ User: Districts
- ❖ Need: Better pothole data
- ❖ Prototype: google fusion tables

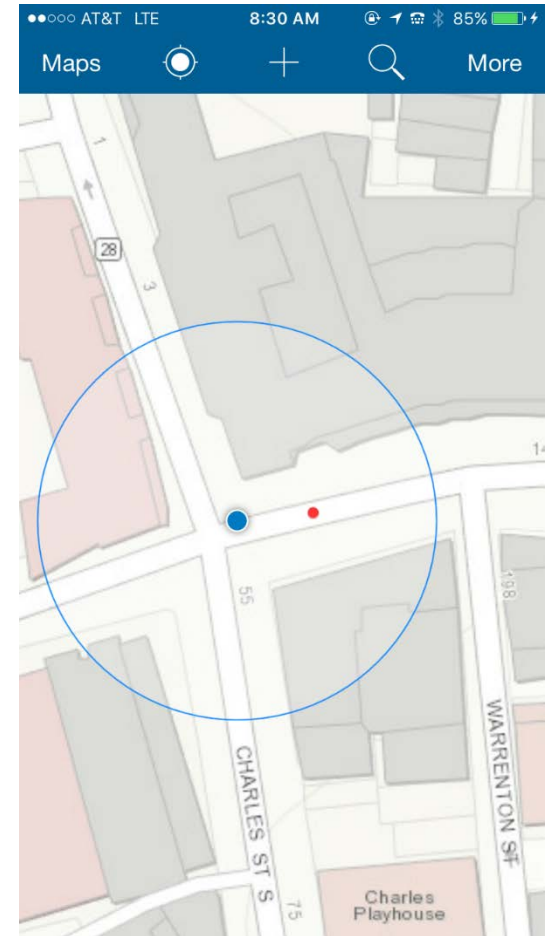
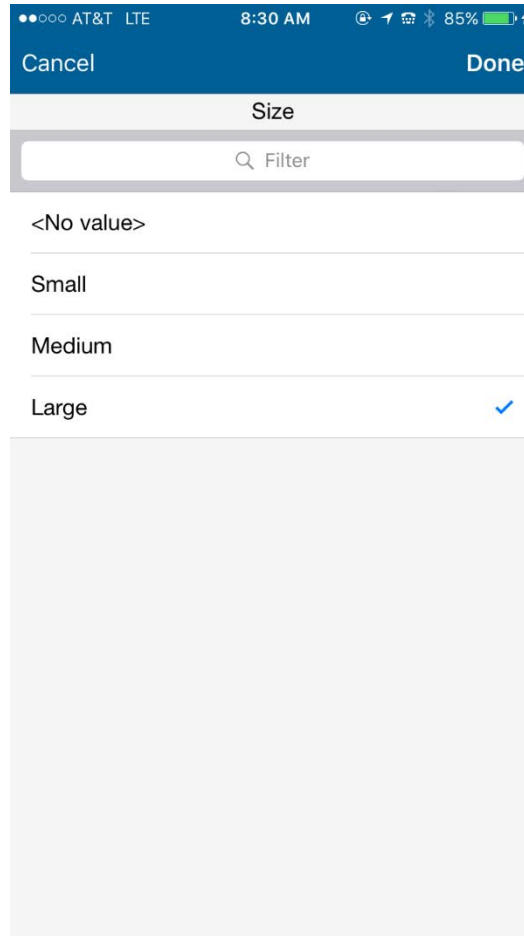
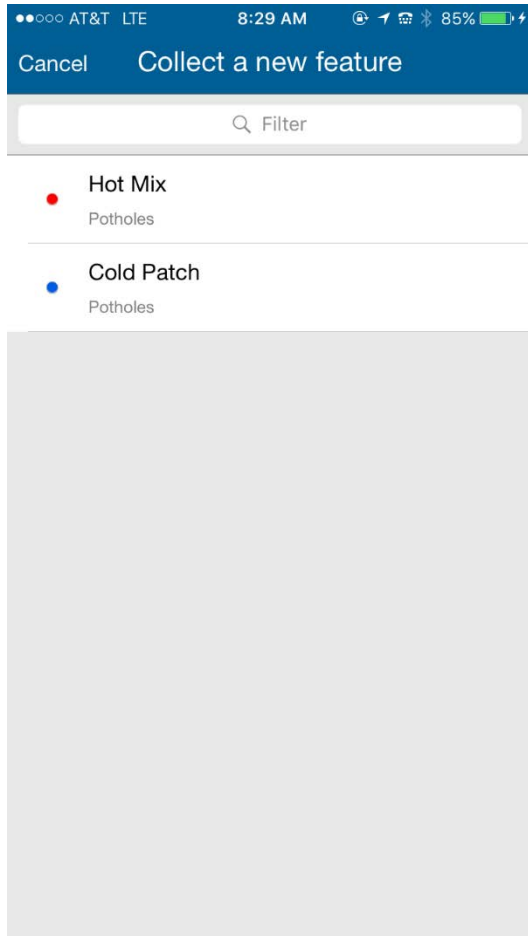
- **Coordinate**

- ❖ *Review, Evaluate, Accelerate and Deploy Innovation*
- ❖ Office of Transportation Planning and Esri ArcGIS Online

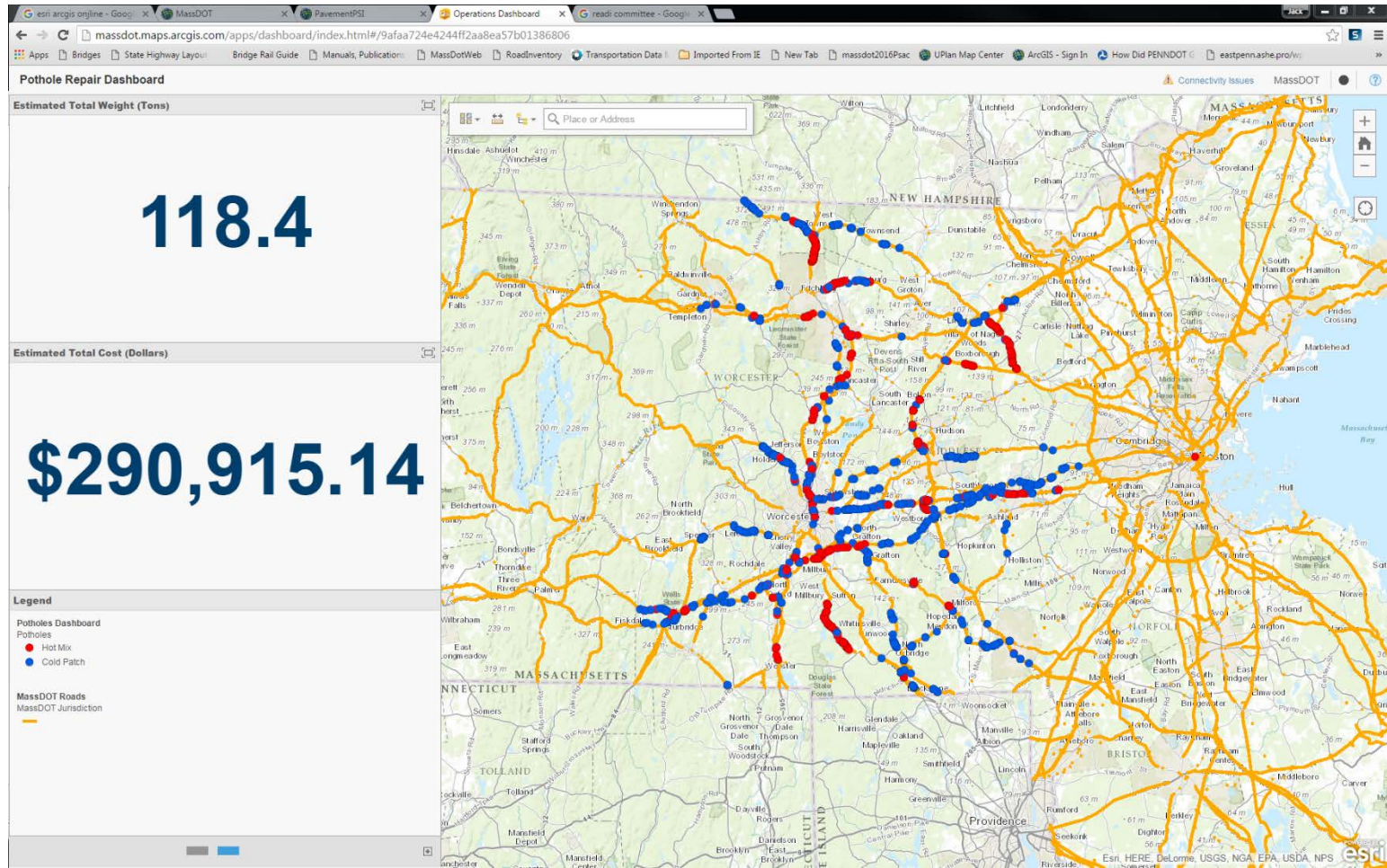
- **Iterate**

- ❖ The Pothole Collector

The Pothole Collector



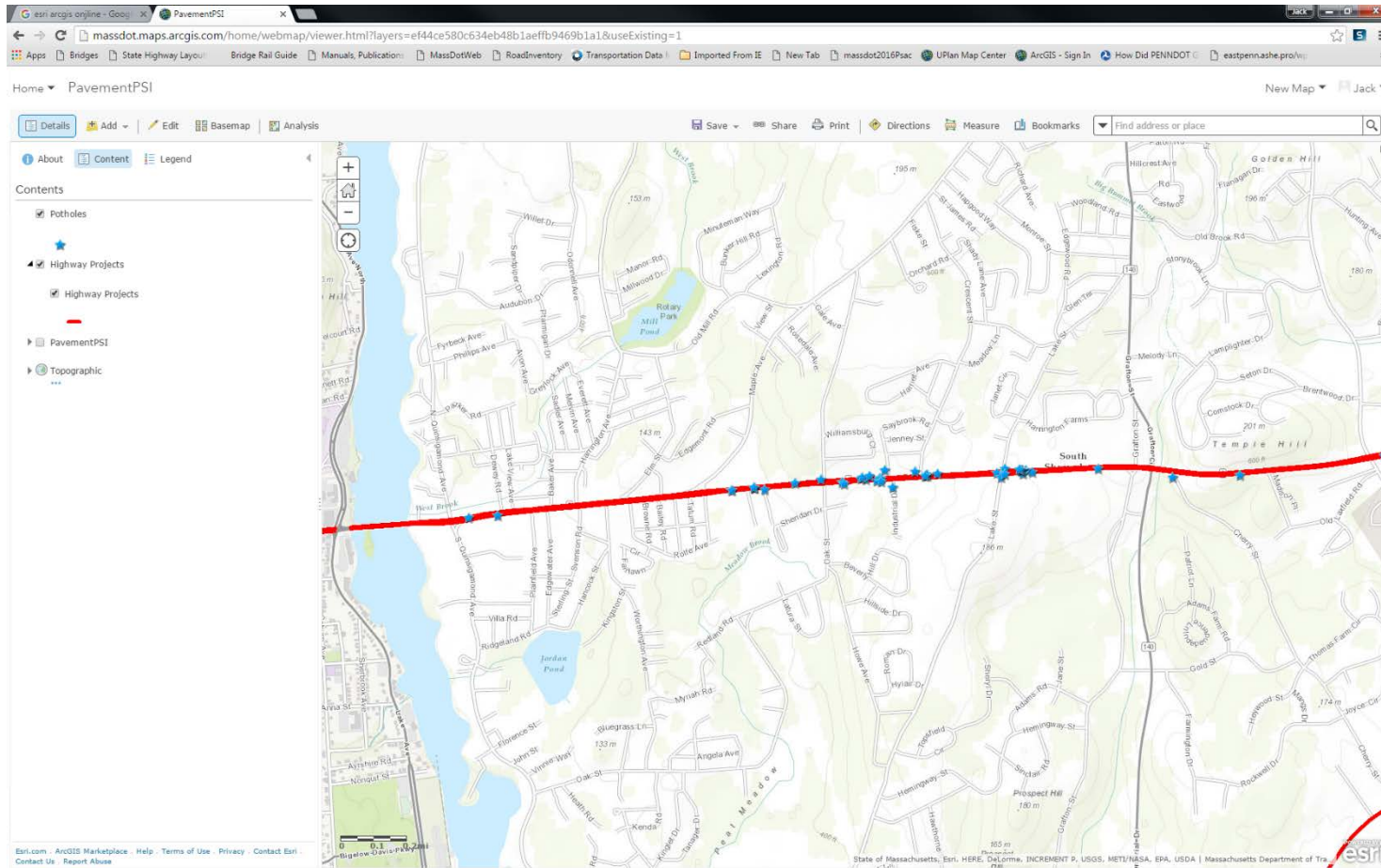
The Pothole Collector



The Pothole Collector



The Pothole Collector



The Pothole Collector

- It lit a fire
 - ❖ It helped us communicate the value of improving our business
 - ❖ It convinced some steadfast holdovers
 - ❖ Helping us rationalize an approach to data and data systems



PUTTING IT INTO PRACTICE ENGAGING THE TAM COMMUNITY

Need for a Proof-of-Concept *Guardrail End Treatments*

- Inventory already underway
- GIS database established
- Newsworthy asset within the agency
- Demonstrated high TAM value



Proof-of-Concept and the TWGs



Policy Advisory Group:

Confirm new MassDOT/AASHTO policies and directives

Business Process and Asset Reporting:

Examine business processes for installation, accident response



Inventory and Asset Data:

Establish appropriate inspection procedure and inventory dataset

Maintenance:

Define standard terminology and condition metrics



Proof-of-Concept Products

- **Data and Systems**

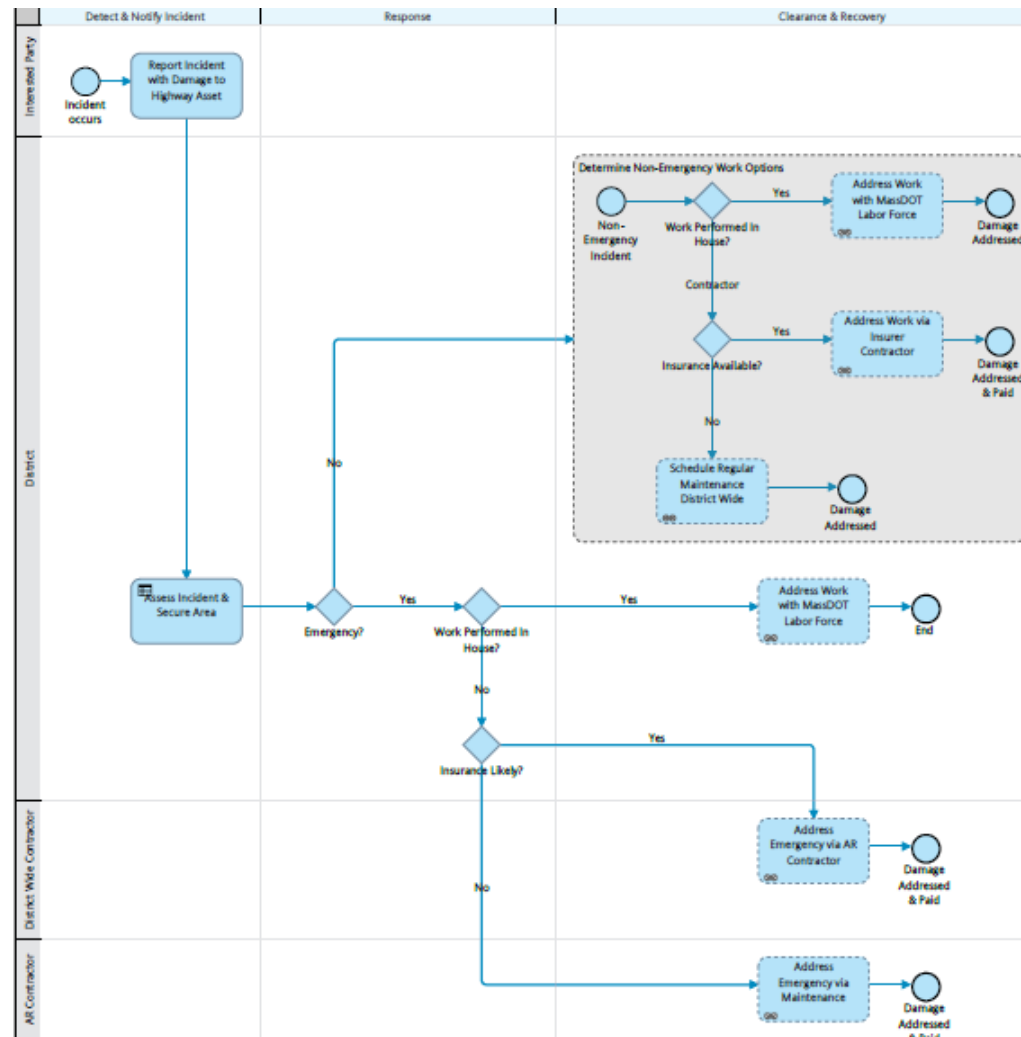
- ❖ ArcGIS Online Collector
- ❖ Build data model that'll work for any asset
- ❖ **Can now use Permit system**

- **New Inspection Procedures**

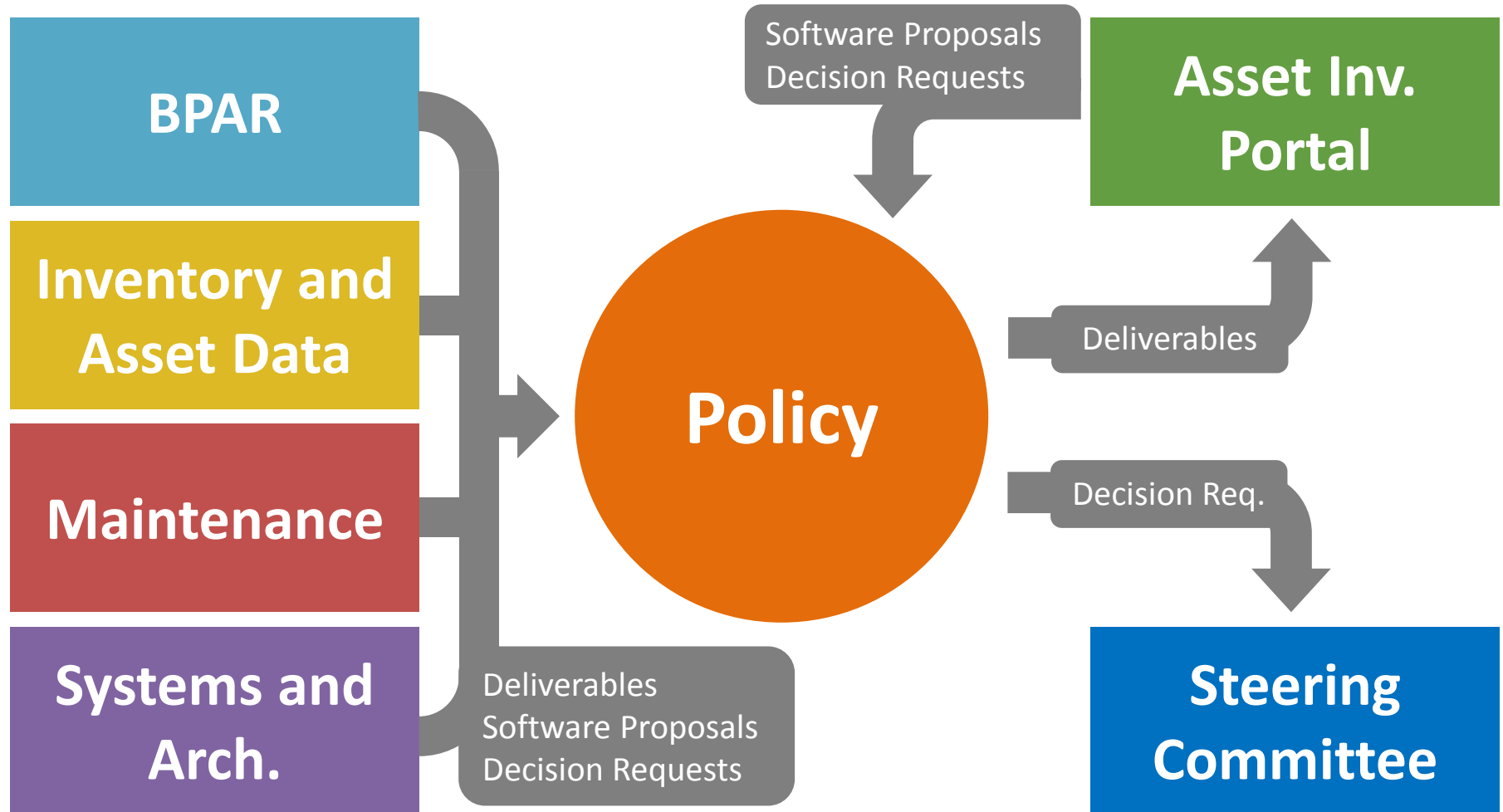
- ❖ Defining “broken”
- ❖ Assessing plow damage

- **New Business Processes**

- ❖ Sharing of accident response and maintenance data
- ❖ Engaging insurers and Districts



Proof-of-Concept Engagement





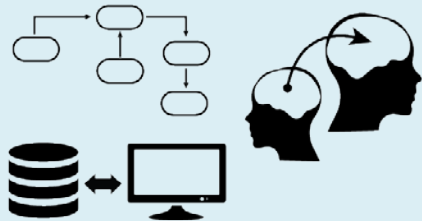
ON REFLECTION...

What's worked

Collaborate

Give *common* direction
Sort TWGs by discipline
Prototypes are kindling

People



Process

Find efficiencies
Use systems better
Better decisions

Light a fire
Start small
Show progress

Technology



In General

- **The right people to do the right work**
 - ❖ Identify and encourage enthusiastic people
 - ❖ The right group blends engineering, planning, and IT
 - ❖ ...but needs someone to bridge the gap
 - ❖ ...and loves data
 - ❖ ...and software
- **Maintain the vocal support of champions**
 - ❖ Asset Management can be seen as a “fad” that will pass
 - ❖ Consistent support from Chief Engineer and CEO



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