

**Department of Transportation
Office of the Chief Information Officer
Enterprise Architecture and Business Transformation Office**

Segment Approach to Transformation at DOT

Last updated:

January 2009

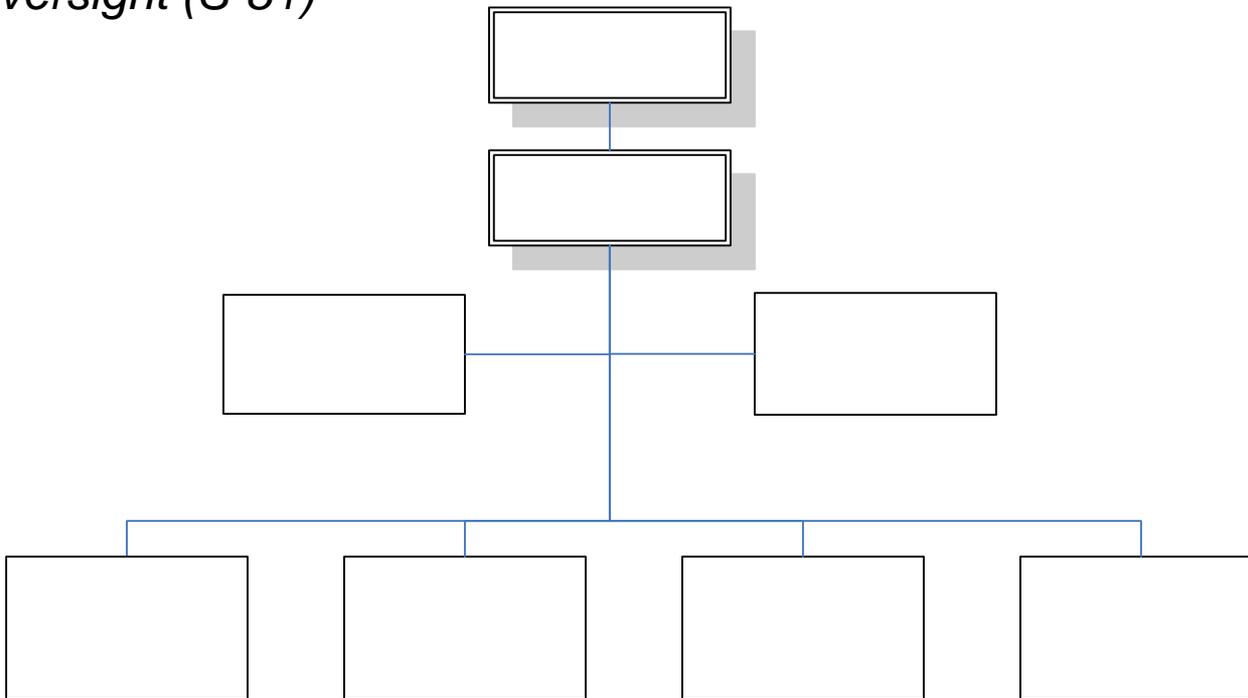
Presentation Overview

- Provides an overview about segment architecture
- Reviews the segment approach used at DOT
- Discusses the Federal Segment Architecture Methodology (FSAM)
- Reviews planned next steps for the DOT Enterprise Architecture & Business Transformation Office (EABTO)

Mission:

Facilitate agency use of structured tools and well-defined processes that optimize decision-making and management of government resources

DOT Office of the CIO, Enterprise Architecture and Business Transformation Office (EABTO) functions under the DOT OCIO, Office of IT Policy Oversight (S-81)



DOT prioritized business questions with agency input

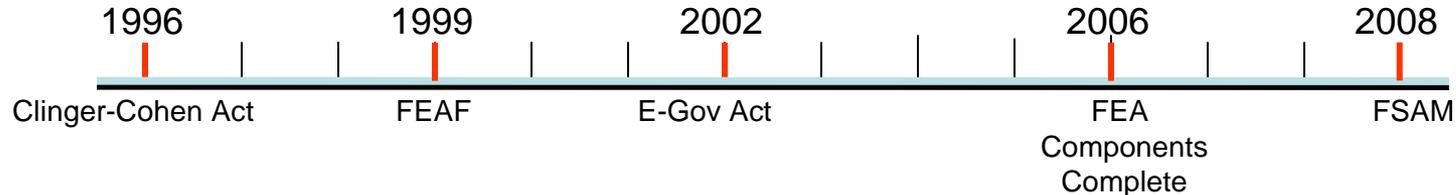
1. What drivers does each system support?
2. What investments support specific strategic goals?
3. What initiatives support specific strategic goals?
4. What performance measures does each system support?
5. What funding sources support each system?
6. Which databases contain authoritative data?
7. What applications support similar business functions?
8. What business processes support which strategic goals?
9. For a given business process, what applications/systems support it and which organizations take part in it?
10. What business functions/systems/databases/organizations (stakeholders) are affected by spawning a new initiative?
11. What is the security impact rating for each system?
12. Which systems do not have a current certification & accreditation (C&A)?
13. Which systems are duplicative (i.e., perform the same business function)?
14. For systems that perform a duplicative function, has a decision been made to accept the duplication or sunset all but one system?
15. Which investments/systems utilize obsolete technologies?
16. What technology standards are approved for use by the organization?
17. What technologies are used by each system?
18. When is a technology standard scheduled to be retired or sunsetted?

Contents

- Segment Architecture Overview
- Governance
- Segment Methodology and Prioritization
- Transportation EA Management System (TEAMS)
- Path Forward

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Background



1996: Clinger-Cohen Act – Mandated that all federal agencies improve effectiveness of IT investments via the integration between capital planning, enterprise architecture (EA), acquisition, etc.

1999: Federal EA Framework (FEAF) – The Federal CIO Council developed the FEAF to provide architecture guidance for federal cross-agency or "segment" architectures. Segments were defined to represent business areas requiring cross-agency collaboration for coordinating activities or sharing resources.

2002: Electronic Government (E-Gov) Act – Required OMB to implement results-oriented controls measuring how technology would "improve the performance and reduce costs of federal government acquisitions".

2006: The complete FEA Components – Provided a Consolidated Reference Model (CRM) designed to facilitate cross-agency analysis and the identification of duplicative investments, gaps, and opportunities for collaboration within and across Federal Agencies

2008: Federal Segment Architecture Methodology (FSAM) – A step-by-step process for developing and using segment architecture

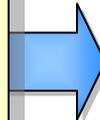
Segment architecture is a results-oriented architecture and transition strategy

- In 2006, the Office of Management and Budget (OMB) requested that all Federal agencies break down agency business lines or “segments” using an enterprise architecture approach called segment architecture
- Segment architecture is a business-driven, results-oriented representation of the strategy, process, and data for a specific portion or “segment” of an enterprise



What Are Segments?

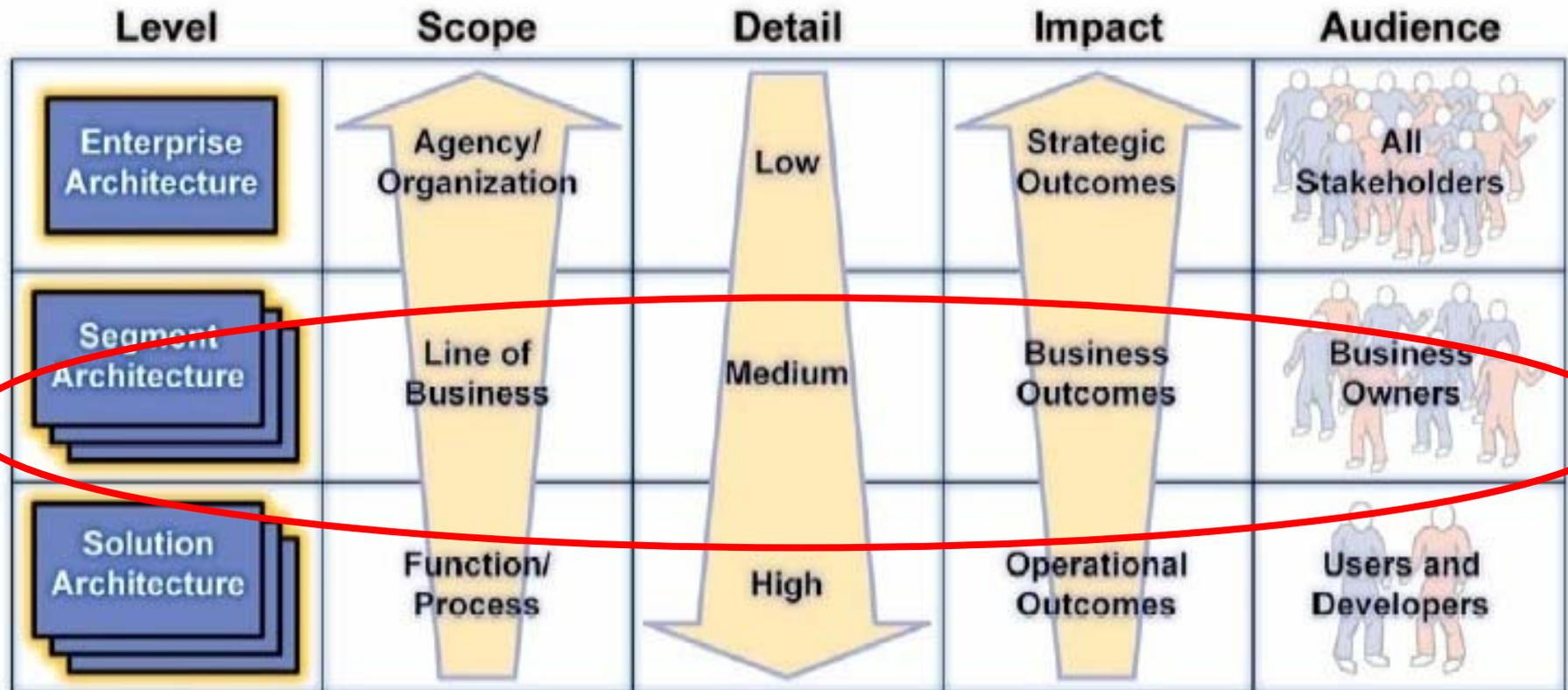
- Common functions of the enterprise describing core mission areas, common or shared business services, and enterprise IT services



What Do Segments Provide?

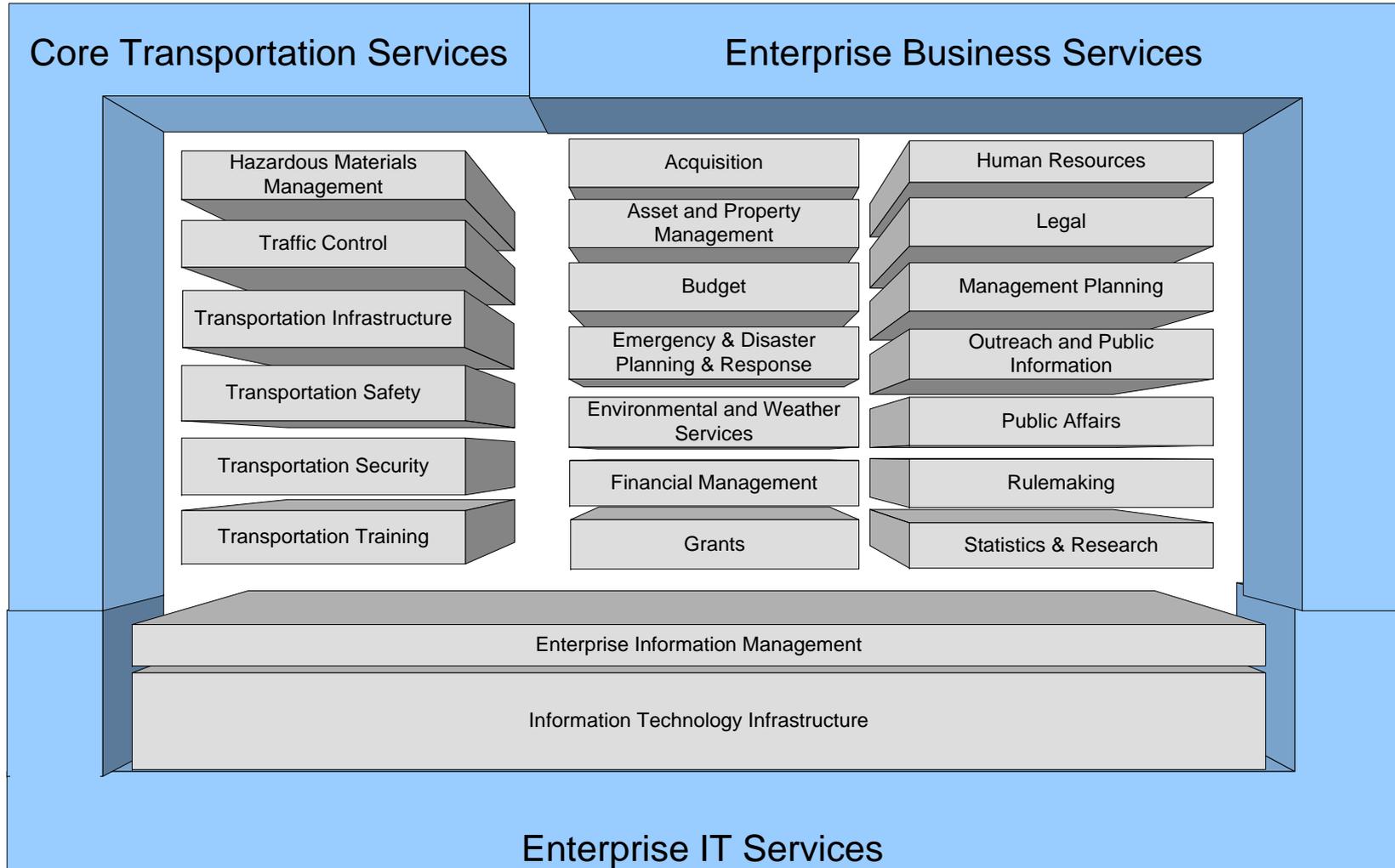
- Business-driven orientation for defining organizational processes
- Identification of opportunities for investment management, data sharing, collaboration, reuse, and informed decision making

“Segment architecture development is a collaborative process forming a bridge between enterprise-level planning and the development and implementation of solution architecture.”



Source: FEA Practice Guidance Nov 2007

DOT's Segments include Core Transportation, Enterprise Business, and Enterprise IT Services



... as well as improves performance and reduces inefficiencies

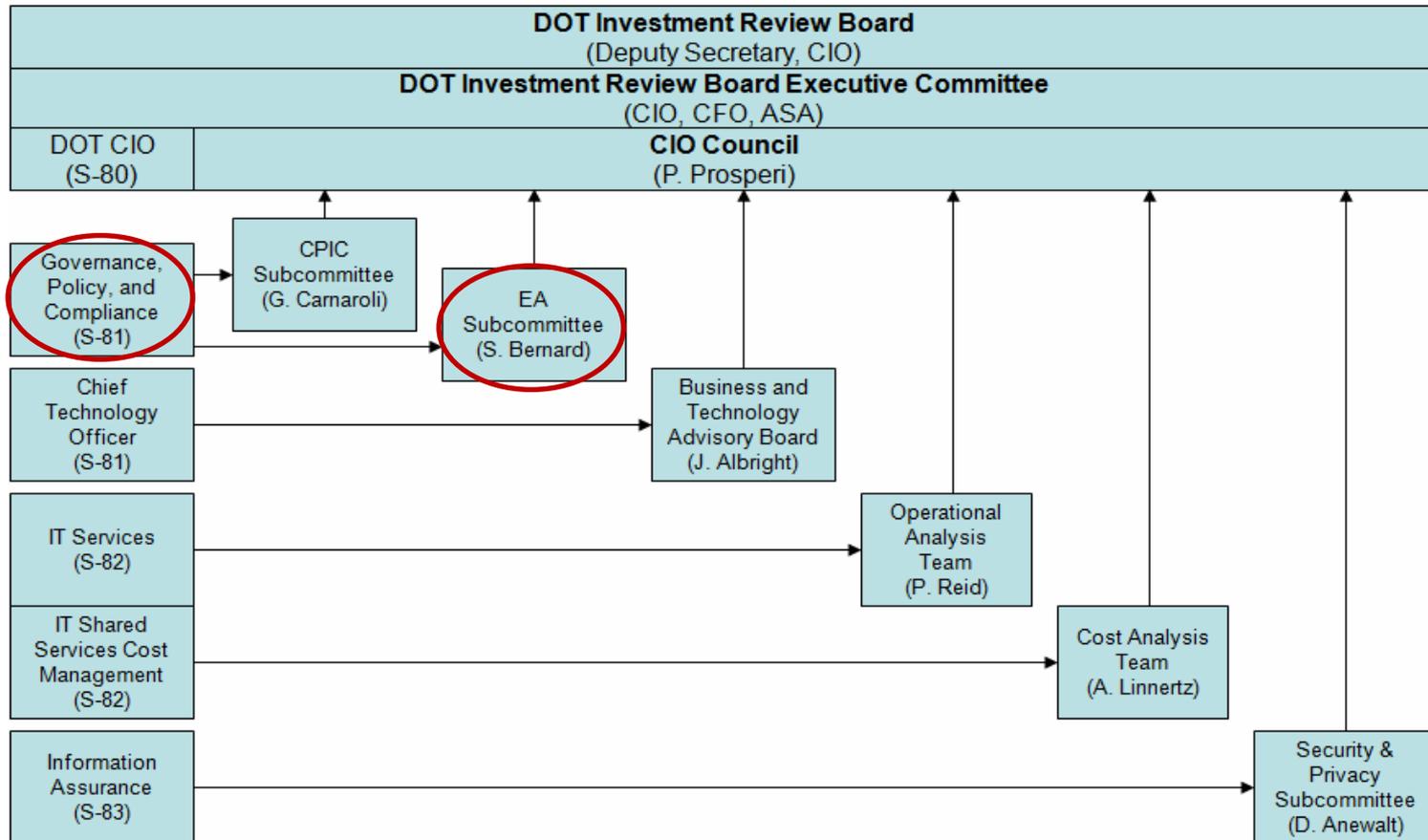
- Timely Access to DOT-wide Information/Knowledge 
 - Facilitate aggregation and dissemination of DOT information to stakeholders on demand
- Reusable Processes/Data/Technology 
 - Identify opportunities for re-use and streamlining of process/data/technology
- Data Standardization and Data Quality 
 - Support data standardization and promote data quality providing foundation for data re-use
- Data Sharing and Collaboration 
 - Facilitate segment-focused data sharing and collaboration using franchise model
- IT Investment Forecasting 
 - Identify opportunities to coordinate IT investment planning for data associated w/ those investments
- Strategic Planning Support 
 - Support OAs in leadership and governance of segment and other cross-agency initiatives

Each role is critical to success in the segment approach

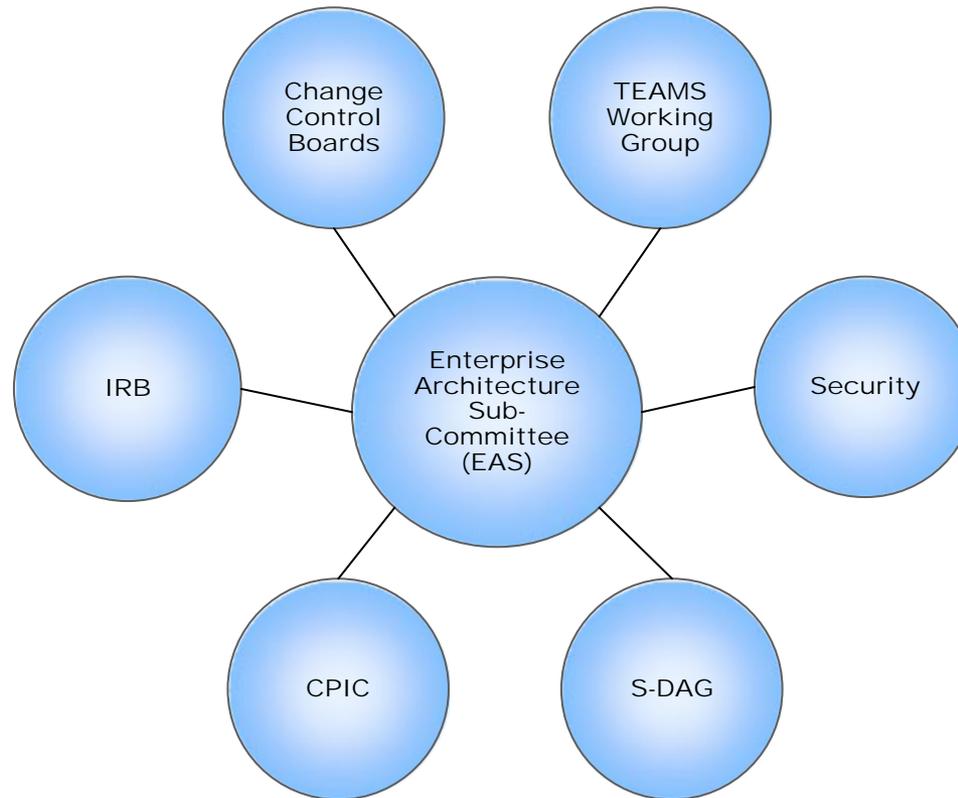
| Role | Responsibilities |
|--|---|
| DOT Enterprise Architecture and Business Transformation Office (EABTO) | <ul style="list-style-type: none"> • Facilitate overall segment development • Provide enterprise architecture strategic and tactical expertise • Provide Department-level guidance and templates in completing segment architecture process steps • Share success stories and lessons learned across segments and organizations |
| Segment Executive Sponsor (also called Segment Owner) | <ul style="list-style-type: none"> • Champion the concept of transformation within the segment; promotes segment vision and goals within the Department • Provide visionary leadership and play an active role in shaping the direction of the segment architecture • Play a key role in decision making to determine direction and scope of the segment architecture findings and recommendations |
| Segment Program Manager | <ul style="list-style-type: none"> • Identify segment requirements, gaps, and opportunities for improvement • Communicate segment scope and vision • Set performance goals, develop project and sequencing plan • Coordinate with DOT CIO functional areas (CPIC, Security, etc.) |
| Segment Core Team Members | <ul style="list-style-type: none"> • Provide business focus area strategic and tactical expertise • Provide access and introduction to SMEs and stakeholders during blueprint development • Shape and develop the target state for the segment • Communicate regularly with segment stakeholders and the segment sponsor throughout the segment architecture development process |

- Segment Architecture Overview
- **Governance**
- Segment Methodology and Prioritization
- Transportation EA Management System (TEAMS)
- Path Forward

As part of the DOT IT Governance Structure, activities are managed through the EA Subcommittee



The EA Subcommittee collaborates and receives inputs from related areas



Integrating with operational and change management structures enhances IT management processes to ensure alignment across DOT

- Segment Architecture Overview
- Governance
- **Segment Methodology and Prioritization**
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DOT's adopted segment methodology is based on federal best practices

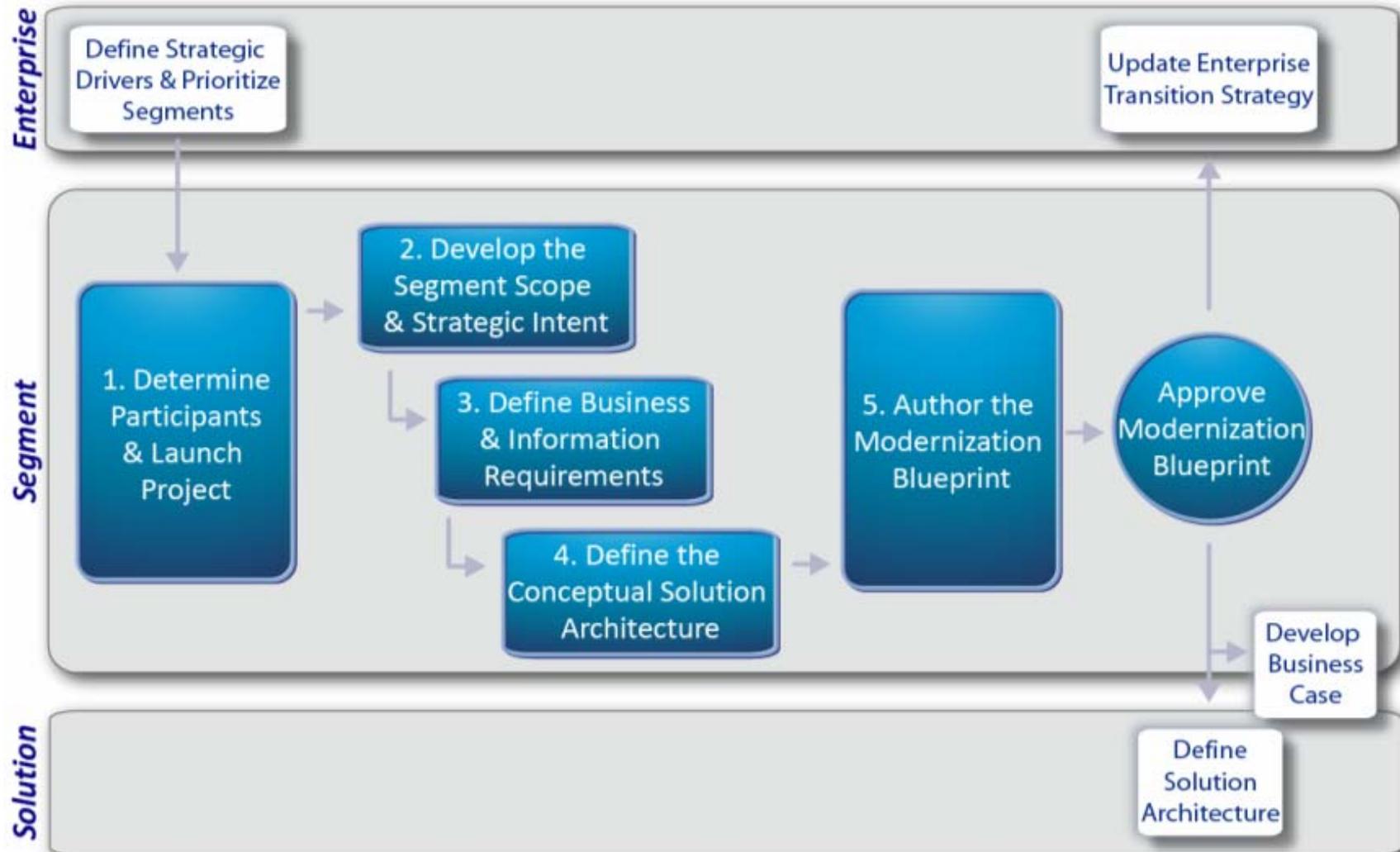
Federal Segment Architecture Methodology (FSAM)



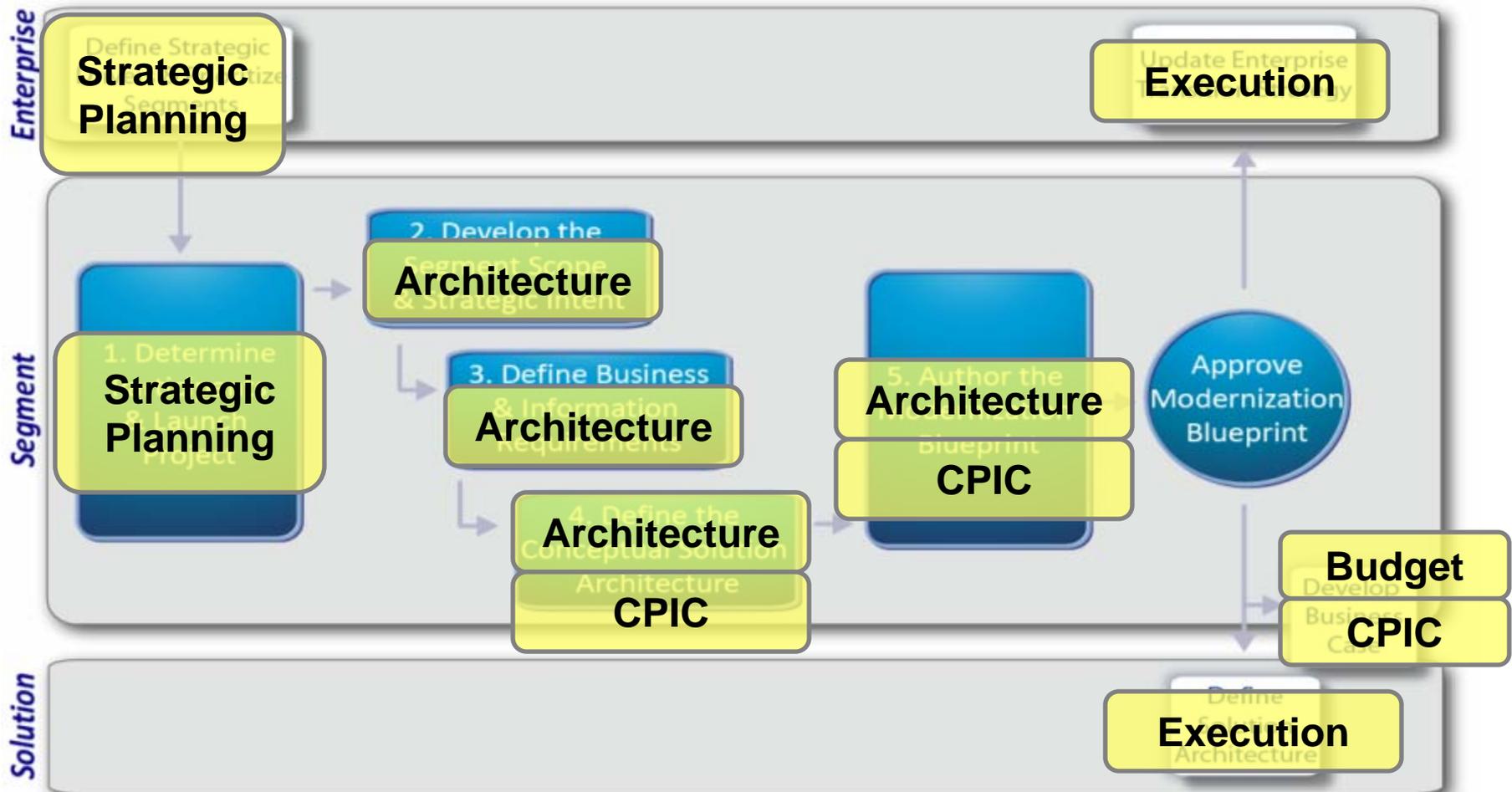
FSAM Federal
Segment
Architecture
Methodology

- A step-by-step process for developing and using segment architecture
- Goal is to increase the value and use of segment architecture through consistent segment architecture processes and products
- Created by chief architects within the federal community by reviewing over 200 federal “best practice” analytical techniques, templates, and examples
- Focuses on key areas:
 - Primary change drivers impacting the segment
 - Current segment systems and resources
 - Deficiencies or inhibitors to success and improvement of information security within the segment
 - Vision and performance goals for the segment
 - Design alternatives for achieving performance goals
 - Project planning for achieving the target segment architecture

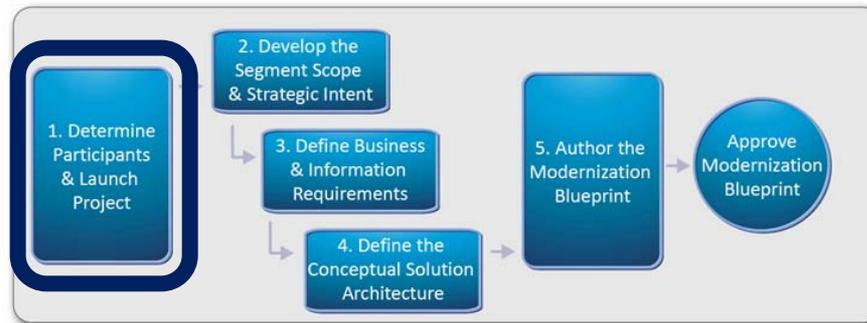
FSAM follows a five-step process to develop segment architectures for an agency's lines of business...



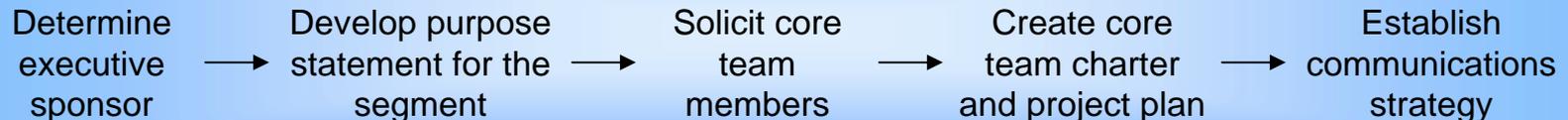
... and supports the entire lifecycle from strategic planning to execution



Step 1: Determine participants and launch project



At-a-Glance Activities:



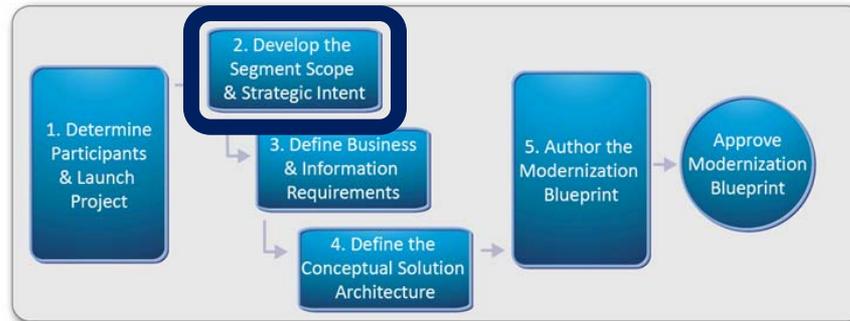
Outputs/Artifacts:

- Segment architecture development purpose statement
- Core team charter
- Project plan
- Communications strategy

Outcomes:

- Establish the segment governance framework
- Validate the business owner(s)
- Formally appoint an executive sponsor and a core team
- Establish the purpose statement to guide the architecture development
- Establish project management foundation w/ project plan and communications strategy

Step 2: Develop the segment scope and strategic intent



At-a-Glance Activities:



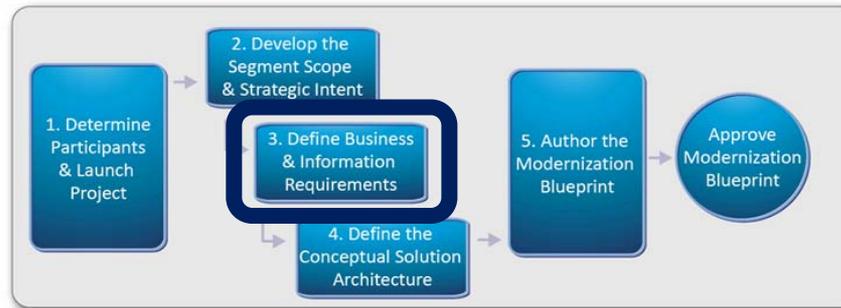
Outputs/Artifacts:

- Business drivers and mandates
- Segment scope
- Performance gaps
- Strategic improvement opportunities
- Segment performance goals and objectives
- Performance scorecard

Outcomes:

- Segment scope and prioritized strategic improvement opportunities based upon the needs of the business
- Establish the strategic intent, which consists of the target state vision, performance goals, and common / mission services target maturity levels

Step 3: Define business and information requirements



At-a-Glance Activities:



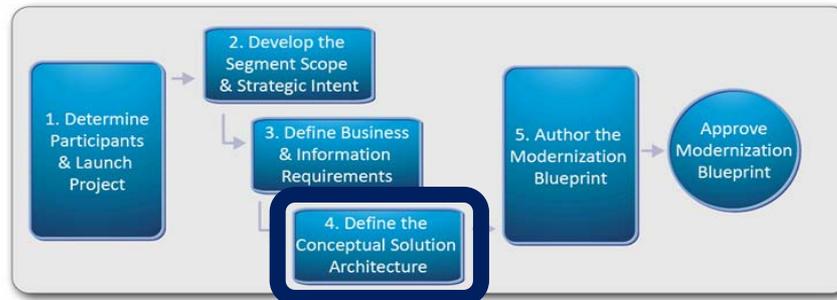
Outputs/Artifacts:

- As-is business value chain
- As-is business function model
- As-is key information sources and qualitative assessment
- Target business function model
- Target conceptual data model
- Target data steward assignments
- Target information sharing matrix

Outcomes:

- Understanding of the required adjustments to the current business and information environments to achieve the target performance architecture

Step 4: Define the conceptual solution architecture



At-a-Glance Activities:



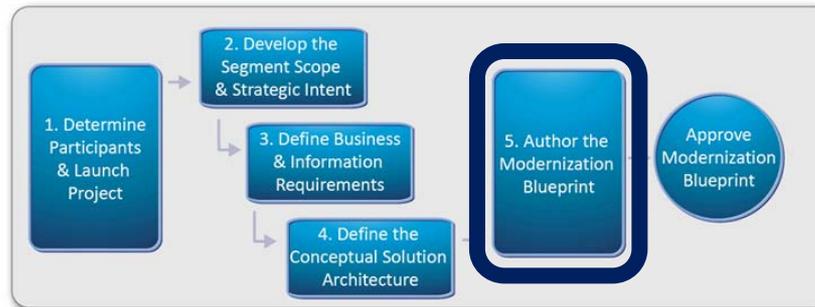
Outputs/Artifacts:

- As-is conceptual solution architecture
- Target conceptual solution architecture
- Target Service Component Architecture
- Target Technical Architecture
- Reuse Summary
- Data Reuse
- Recommendation sequencing milestones

Outcomes:

- Conceptual solution architecture that supports the target performance, business and data architectures developed in the preceding steps
- Advantages and disadvantages of alternative strategies for transitioning from the as-is state to the target state

Step 5: Author the modernization blueprint



At-a-Glance Activities:

Perform cost/value/risk analysis to develop implementation recommendations



Develop draft blueprint and sequencing plan



Review and finalize the blueprint and sequencing plan



Brief core team and obtain approval

Outputs/Artifacts:

- Strategic systems migration/sequencing overview
- Segment architecture blueprint document (including sequencing plan)
- Segment mappings
- Transition plan milestones

Outcomes:

- Series of validated implementation recommendations described in a detailed, actionable segment architecture blueprint supported by holistic analysis of segment business, data, technology, and service components
- Review and approval of blueprint and sequencing plan by executive sponsor, business owner, and core team

More detailed information on FSAM description, templates, and artifacts can be found at the following link:

<http://www.cio.gov/index.cfm?function=specdoc&id=Federal%20Segment%20Architecture%20Methodology&structure=Information%20Technology&category=Enterprise%20Architecture>

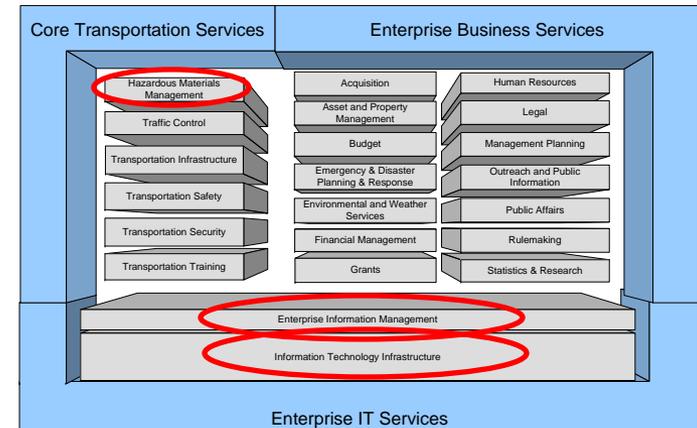


Segment prioritization process identifies high priority segments for transformation/modernization

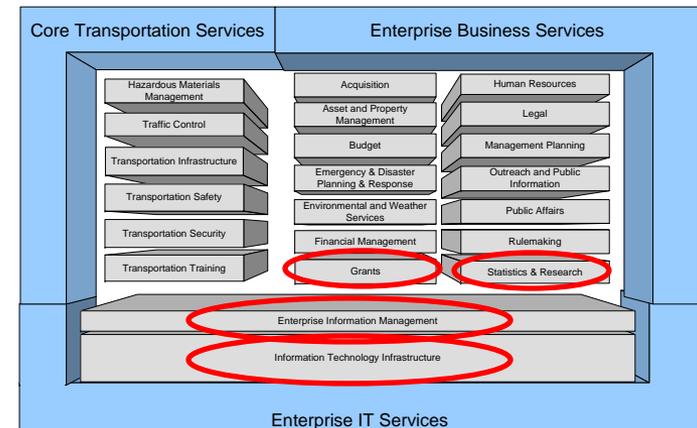
- Purpose includes:
 - Identification of opportunities for cost savings, improvement of IT portfolio quality, and improvement of the quality, validity, and timeliness of mission performance and cost accounting metrics
 - To be used as a tool to support decision making for DOT CIO Council
- Our segment prioritization methodology involved a questionnaire addressing multiple categories:
 - Financial
 - Performance
 - OMB Priorities
 - DOT priorities
 - Risk

Using this approach, our team identified high priority candidates from the survey findings

- Candidates for Potential Transformation (across all segment areas) include:
 - Information Technology Infrastructure
 - Enterprise Information Management
 - Hazardous Materials



- Candidates for Potential Transformation (excluding core transportation service segments) include:
 - Information Technology Infrastructure
 - Enterprise Information Management
 - Grants
 - Statistics and Research



Segment prioritization next steps

- EABTO actions include:
 - Finalize governance processes for segment activities
 - Propose and determine segment sponsors/executive leads
 - Determine status of segment activities underway
 - Brief governance teams and obtain a record of decision for initiating new modernization studies
 - Identify sub-segments for high priority segments
- Segment (business area) actions include:
 - Work with EABTO on segment transformation readiness
 - Facilitate validation of segment and investment alignments

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- **Transportation EA Management System (TEAMS)**
- Path Forward

TEAMS

- The agency's repository for collecting and reporting agency strategic, business, application, information, data, and technology information
 - Provides centralized access to and management of DOT EA information
 - Uses Troux commercial-off-the-shelf (COTS) software technology
- <http://152.120.202.13>
 - User name and password required
 - Please e-mail List-DOT EABTO@dot.gov to request user name and password

Repository (TEAMS)

Transportation EA Management System
- An Integrated View -

Business/Segment Stakeholders



OA Enterprise Architects



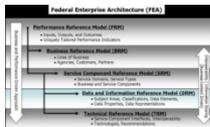
Departmental Data & Systems



Legacy EA Models



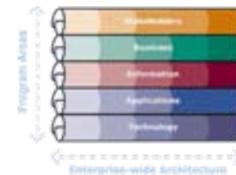
FEA Reference Models



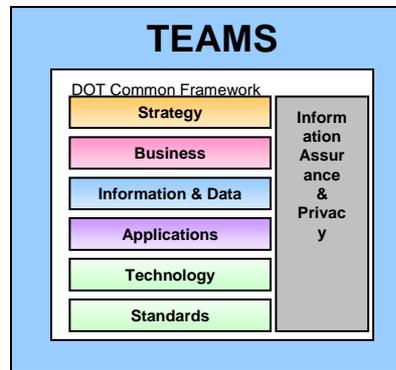
Reports



Forms & Templates



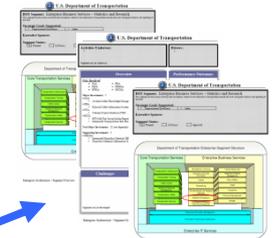
Models



Dashboards



“At a Glance” Summaries



Cross Function Analysis

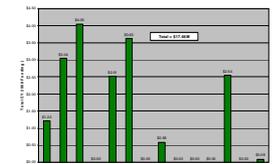
Percentage of Overall IT Portfolio Cost



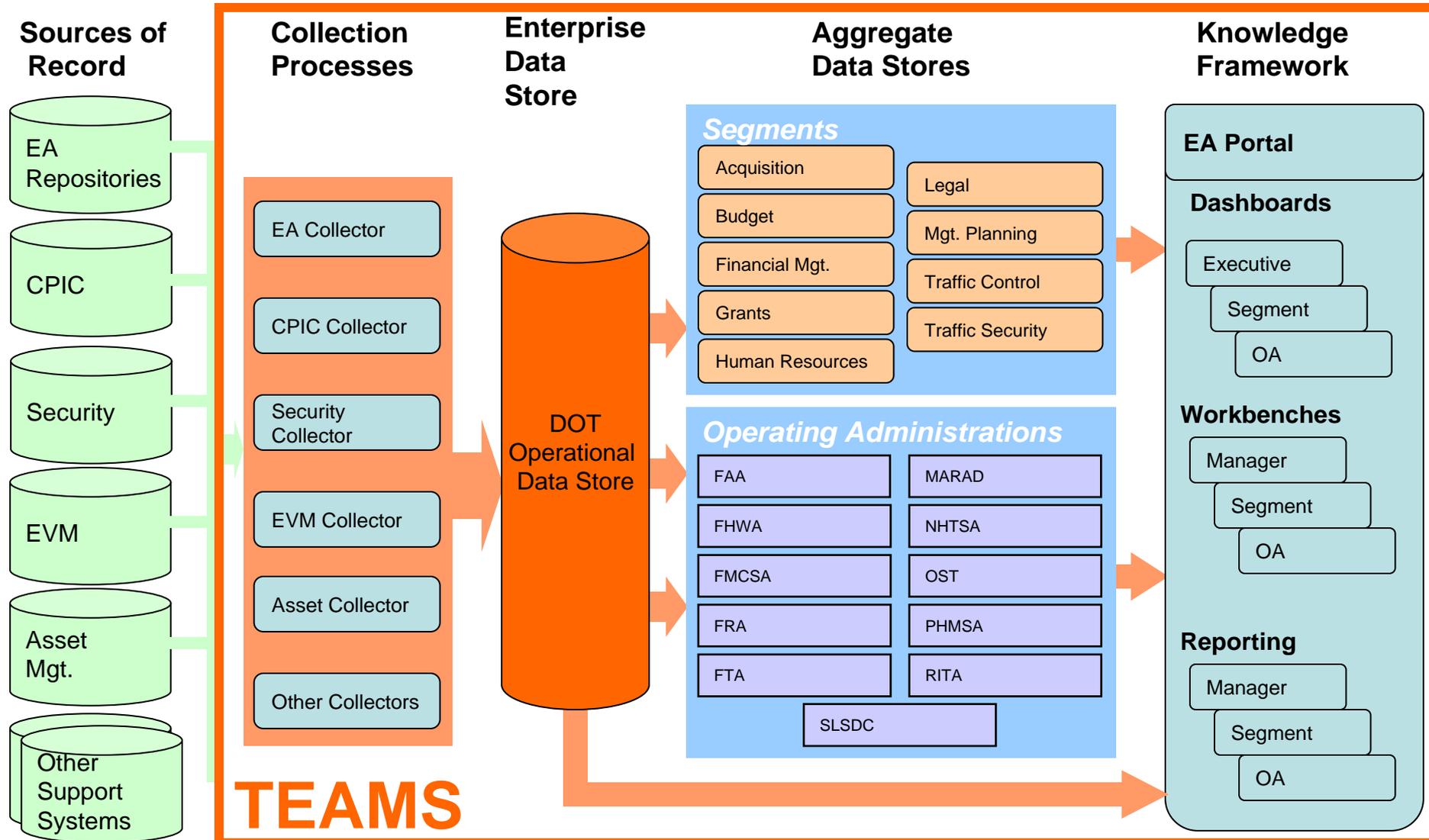
FEA Alignment Reports



IT Portfolio Analysis



TEAMS – Integrated View



- Segment Architecture Overview
- Governance
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In summary, Key Programs/Initiatives within the EABTO include...

- **Develop and instantiate governance and standardized processes to facilitate practical, actionable business transformation**
 - Segment Approval Process
 - Business Needs Process
 - Segment Prioritization Process
- **Implement DOT Enterprise Architecture Assessment Framework (EAAF) for Performance Measurement**
 - Transparent OA performance results evaluated on a periodic basis
 - Framework supports and guides individual OA business transformation and EA activities
 - Assess OA EA Maturity using standardized framework
- **Implement Transportation EA Management System (TEAMS) Department-wide to inform decision-making**
 - DOT's enterprise repository for collecting and reporting strategic, business, application, data, and technology information
 - Centralized access to and management of DOT information on strategy, business functions and processes, applications, data, and technology

What Are Segments?

Common functions of the enterprise describing core mission areas, common or shared business services, and enterprise IT services

...Key Programs/Initiatives (cont'd)

- **Partner with DOT business stakeholders to facilitate segment development activities**
 - Support segment development via governance, standard methodology, and TEAMS
 - Validate segment definitions and IT investment alignments with agency stakeholders
 - Facilitate development/modernization of DOT segments
 - Research and Statistics Segment
 - Financial Management Segment
 - IT Infrastructure Segment
- **Submit 2009 OMB Annual EA Assessment (due February 2009)**
 - Develop plan, identify stakeholders and target artifacts necessary to meet OMB requirements
- **Establish policy for related requirements**
 - Define and implement processes, policies, and guidance
- **Collaborate with external government agencies (e.g., Information Sharing Environment, eGrants, etc.)**

Near Term FY09 EA/Business Transformation Priorities

Governance

1. Implement OA EA Maturity Framework
 - » Monitor EA maturity on quarterly basis
2. Establish processes and guidance for EA-related requirements
 - » e.g., OA EA Maturity Framework, Segment Prioritization

Methodology

1. Develop DOT Business Transformation/Enterprise Architecture Guide
 - » High level overview of the enterprise, segment, and solution architecture process and standard artifacts
2. Provide DOT EA related information to public via external website (OMB M-09-02)
3. Develop EA Value Measurement Plan

Repository (TEAMS)

1. Migration of TEAMS from NHTSA to DOT Environment (urgent)
 - » Aggressive Transition strategy – 12/15/2008
 - » Requirements - Vendor Support:
 - installation, configuration, testing
 - \$10,250
2. Incorporate Worklenz Information
3. Gather information from across the enterprise and populate into TEAMS, in accordance with segment prioritization results and TEAMS population strategy

Visit DOT's EABTO website for the latest information



The screenshot shows the DOT Office of Business Transformation website. The browser address bar displays http://one.dot.gov/ost/s80/S81/EA_Business_Transformation/default.aspx. The page features a navigation menu on the left with categories like Home, DOT Segments, Library, BT/EA Priorities, Discussion, Governance, Methodology, TEAMS, and About. The main content area includes a mission statement, news items such as 'ArchitecturePlus Seminar' and 'DOT Stakeholders for Electrification of Transportation', and a 'Success Stories' section. On the right, there are links for 'TEAMS' and 'DOT SEGMENTS', which are categorized into Core Transportation Services, Enterprise Business Services, and Enterprise IT Services.

http://one.dot.gov/ost/s80/S81/EA_Business_Transformation/default.aspx

For additional information, please contact the Enterprise Architecture and Business Transformation Office (EABTO)

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