Transportation Asset Management Webinar Series

Webinar 3: Asset Management Business Models and Barriers to Implementation

Sponsored by FHWA and AASHTO

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Please do not put your phone on hold.
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U.S. Department of Transportation
Federal Highway Administration

AASHTO
The Voice of Transportation

Webinar 3 — March 13, 2013

FHWA-AASHTO Asset Management Webinar Series

- Sharing of knowledge is a critical component of advancing asset management practice
- This is the third of a 12-part webinar series that will be held over the next two years
- Webinars will be held every two months with topics such as AM and safety, risk-based AM, GIS application in AM, etc.
- Welcome ideas for future webinar topics and presentations
- Submit questions using the webinar's Q&A feature
- Next webinar: **Asset Management and Risk Management – May 8, 2013 2:00 EST**

AM Business Models Overview

- There are many ways to deliver effective asset management
  - How you are organized
  - Key policies that drive TAM
  - Tools and processes that work together to support TAM
- Forces that influence the best model for an agency are:
  - Level of TAM maturity
  - Senior Leadership passion and support
  - Resources (funding, human capacity)
- AM business models are ways that agencies have set up their AM programs

Webinar Overview

- Three transportation agencies with differing TAM models will share their experiences and lessons learned
- The models that will be presented focus on a combination of organizational structure, governance, processes, and information support for TAM
- Presentations will cover historical context for the business models that are in place today
  - Sharing what were the forces that led them to where they are today

Learning Objectives

- Understanding the strengths and limitations of specific AM business models
- What are common themes across the model and what are differences
  - What are the unique situations in states that have themes that just apply to them
- How do the models presented relate to your agency's situation
- Gaining familiarity with successful approaches to overcoming barriers to implementation.
- **SHARE LESSONS LEARNED, IDEAS, KNOWLEDGE!!!**

Webinar Agenda

2:00 **Webinar introduction and overview**
Matt Hardy (AASHTO) Steve Gaj (FHWA) and
Hyun-A Park (Spy Pond Partners, LLC)

2:15 **Asset Management Business Models in Colorado DOT**
Scott Richrath (Colorado DOT)

2:35 **TIMS: Embedding Asset Management in the Information System**
Touraj Nasseri (Alberta Transportation)

3:55 **TAM Business Models: NYSDOT's Experience**
Brad Allen (New York State DOT)

3:15 **Q&A and wrap up**

Asset Management Business Models

and Barriers to Implementation

AASHTO & FHWA

Scott Richrath, Transportation Performance Branch Manager
Colorado DOT

March 13, 2013

Agenda

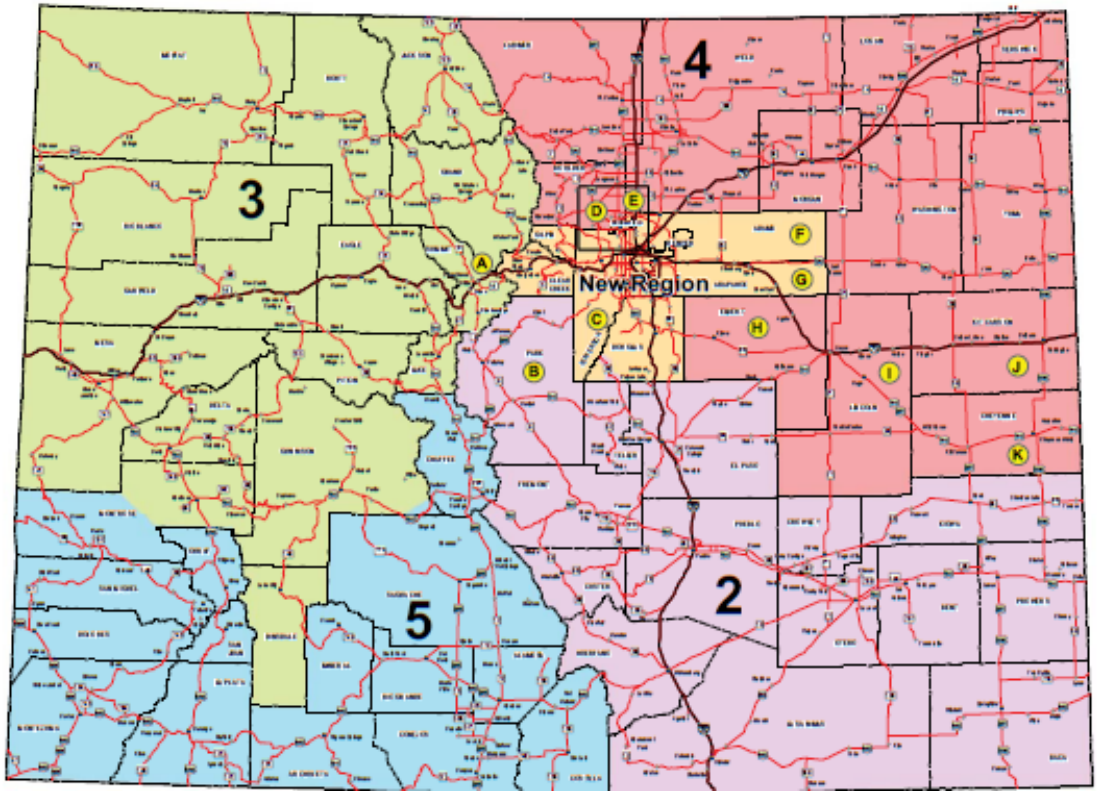
- Barriers to Implementation
- CDOT Asset Management Update


About Colorado

- 2010 Census Population: 5,029,196

  (17% growth since 2000)
- Slightly <2% of US population, GDP, FHWA distributions
- MPOs: 5
- Centerline miles: 88,389

  (9,109 owned by CDOT)
- Colorado DOT
  - ~~6~~ 5 engineering regions →
  - 3,000+ employees
  - ~$1 billion annual budget



Barriers to Implementation

Resources

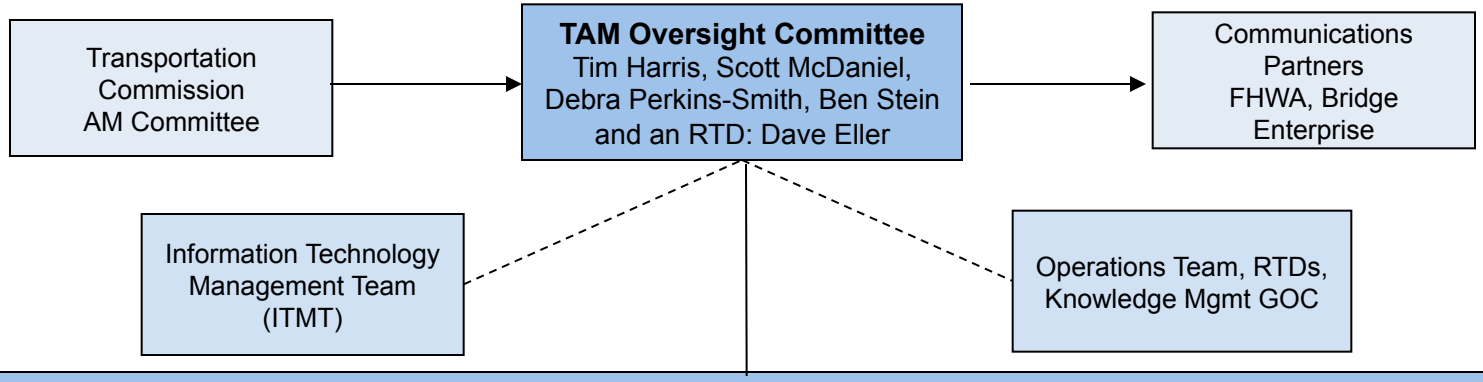
Technology

Communication

Barriers to Implementation

Resources

CDOT Transportation Asset Management (TAM) Structure



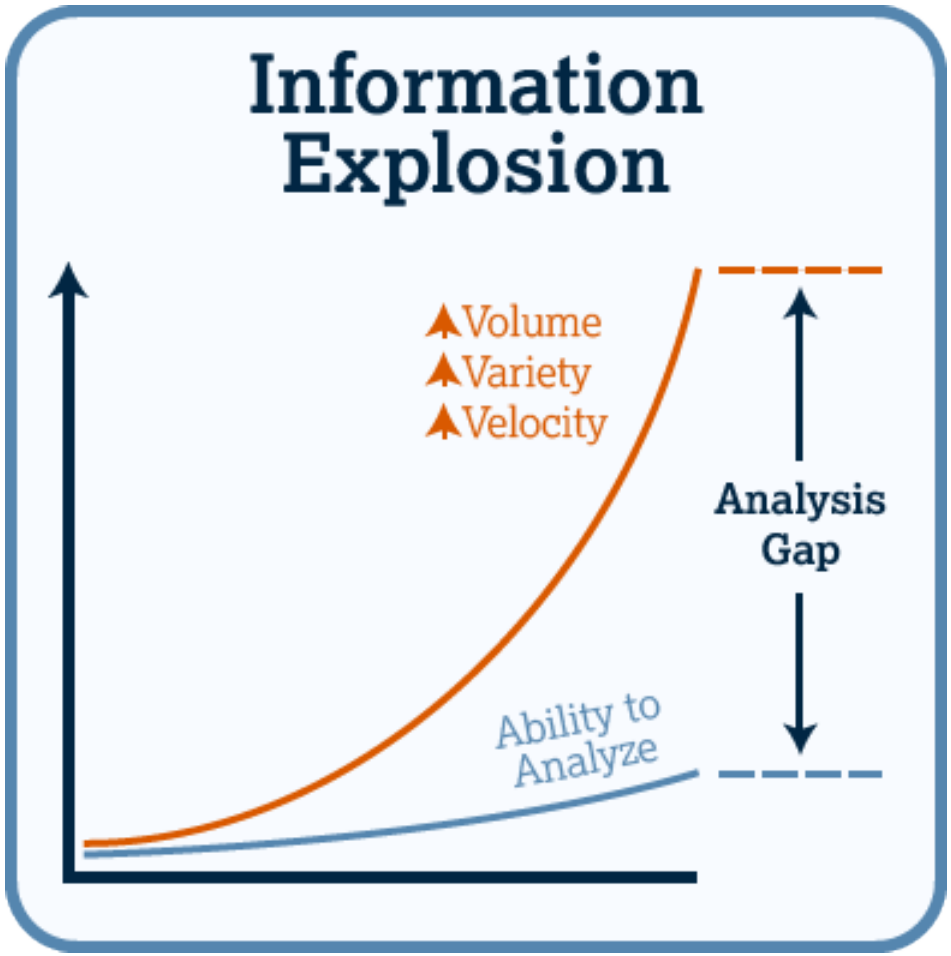
TAM Working Committee

- Scott Richrath, Committee Chair
- JoAnn Mattson, Committee Vice Chair
- Sandi Kohrs, DTD Planning
- Bob Haley, Chief Engineer's Office
- William Johnson, GIS
- Lou Henefeld, GIS
- Josh Laipply, Staff Bridge
- Mark Nord, Staff Bridge
- Cole Richards, Staff Bridge
- Stephen Henry, Pavement
- Bill Schiebel, Materials and Geotech
- Dave Wieder, Maintenance & Operations
- Roy Smith/Karen Neuschwanger, Fleet
- David Fox, Real Property Building Assets
- Rich Sembrat, ITS
- Charles Meyer, Traffic
- Laurie Freedle, OFMB
- Region 1 Rep, TBD
- Doug Lollar, R2 Program Engineer
- Jason Ahrens, R2 Business Manager
- Zane Znamenacek, R3 Traffic Engineer
- Mike Goolsby, R3 Deputy Superintendent
- Myron Hora, R4 Plng and Env. Manager
- Mike McVaugh, R5 Traffic and Safety Engr
- Cambridge Systematics/Redd Engineering

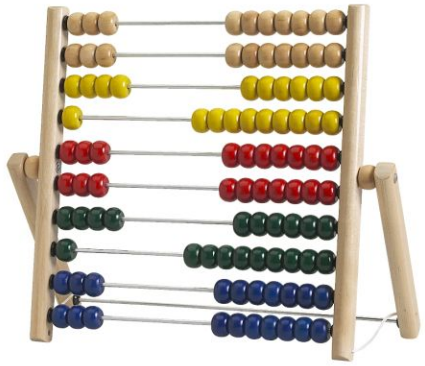
Multi Asset Management Task Force	Asset Management Pilot Selection Task Force	Cross - Asset Integration Task Force	Risk Task Force	Colorado Const. Cost Forecast Task Force
DTD Staff Bridge Pavement Maintenance Fleet ITS	DTD IMB DTD TPB Region 2 Region 3 Region 4 Region 5	Pavement DTD TPB Maintenance	Staff Branches DTD TPB OFMB Region 4 Region 5 Risk Mgmt.	Staff Branches DTD TPB OFMB Consultant

Bridge Task Force	Real Estate Task Force	Communicating Value of Preservation Task Force	Tunnels Task Force	Maintenance Operations and Traffic Operations Task Force
Staff Bridge DTD TPB	HQ Property Mgmt DTD TPB	DTD MPB	Staff Branches DTD TPB Region 3 Region 5	MLOS HQ Traffic Ops DTD TPB Region rep GIS Unit TAM Consultant

Barriers to Implementation



Barriers to Implementation



Technology

Past Transportation Asset Management (TAM) at CDOT

1991

1992

1993

1994

Bridge starts recording element level inspection data in Pontis

1995

1996

1997

Pavement starts collecting data statewide

Maintenance starts using MMS; tracks work orders

1998

Pavement selects Deighton for pavement asset mgmt

1999

Pontis first used to support MLOS

MLOS system is developed in Excel; extracts work order data from MMS; 1st rpt cycle with the TC

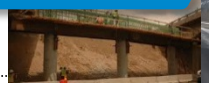
2000

Bridge uses Pontis to manage bridge assets

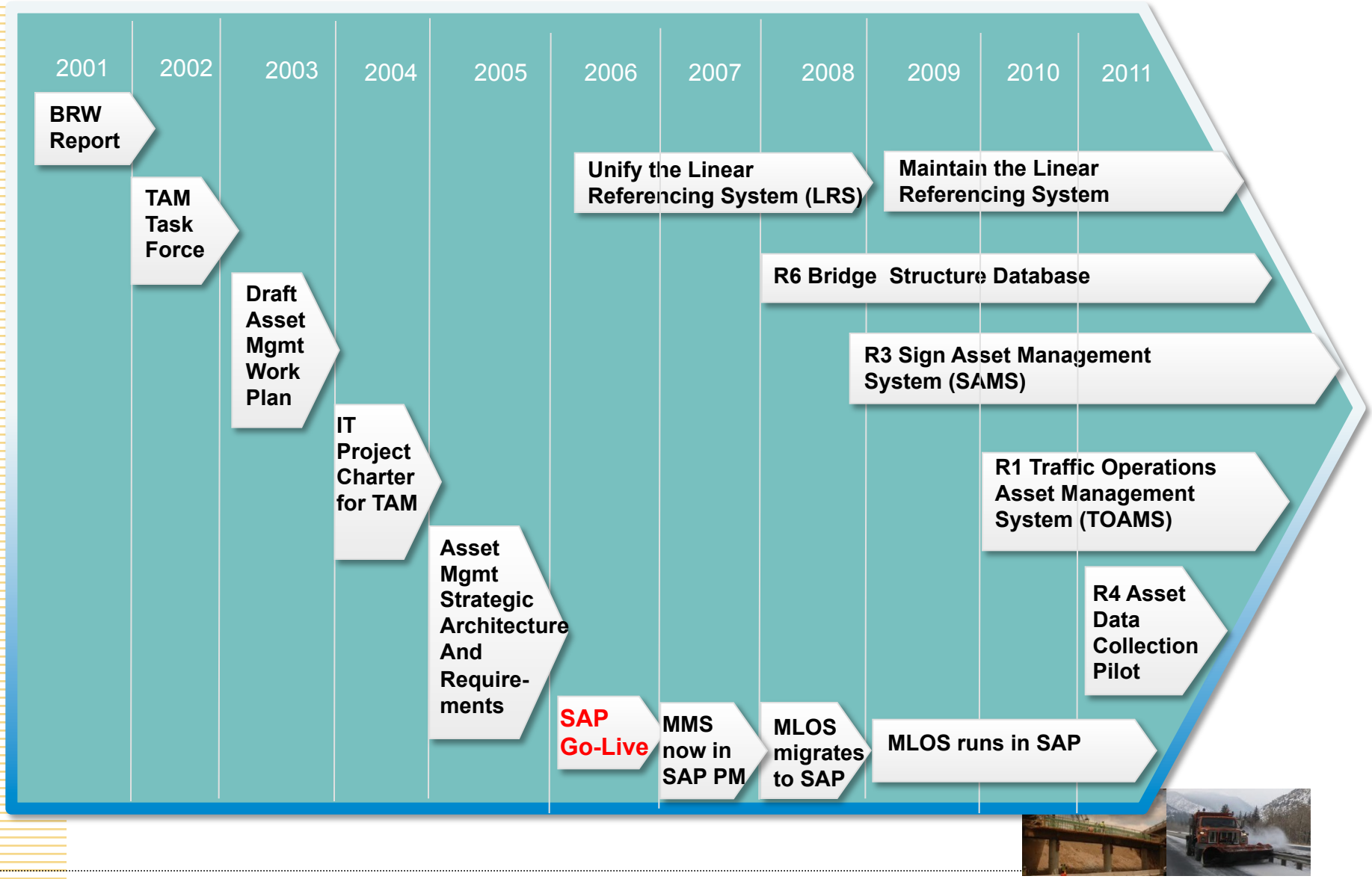
1st reporting cycle to TC with Deighton

MLOS runs in Excel until migrating to SAP

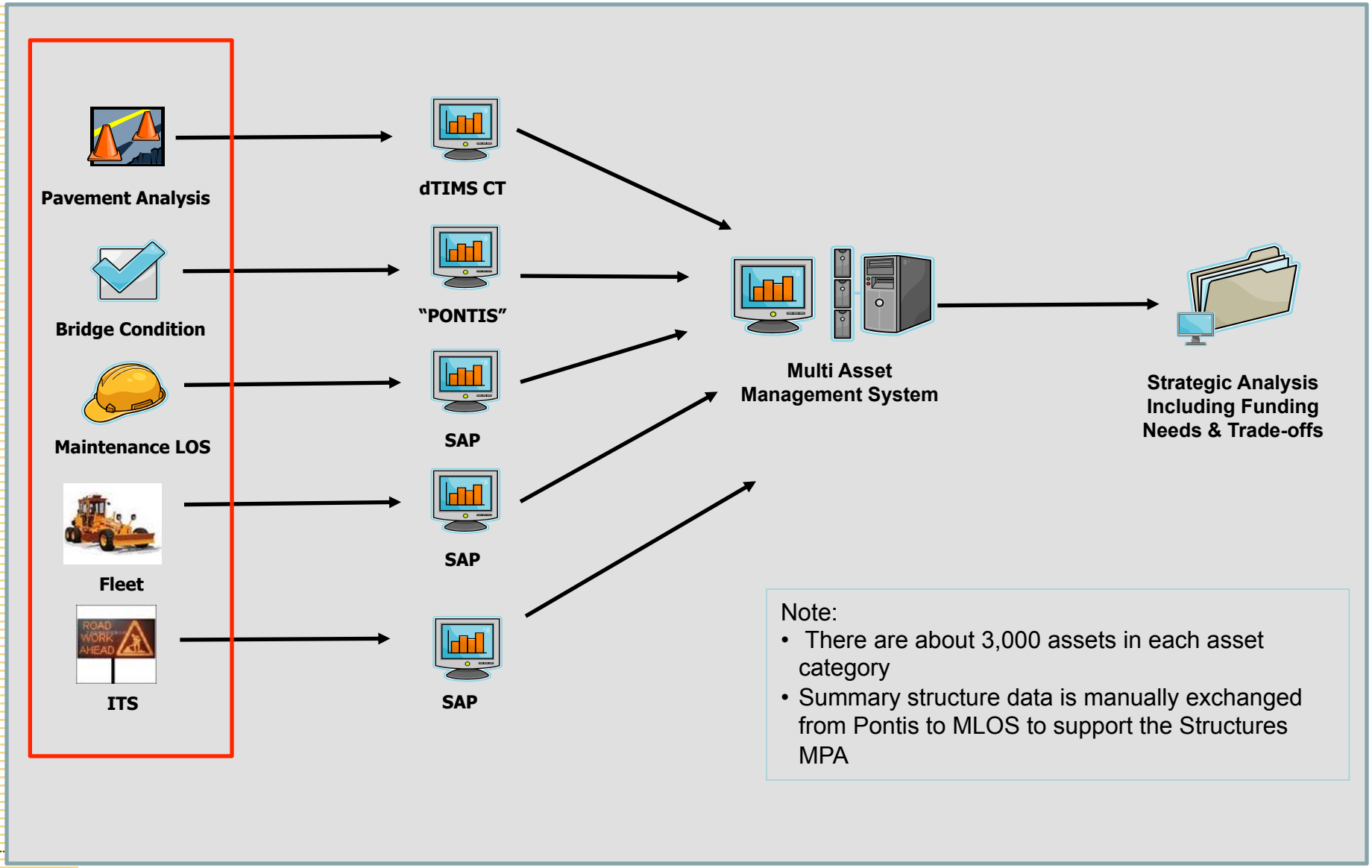
Pavement uses Deighton to manage pavement assets



Past Transportation Asset Management (TAM) at CDOT



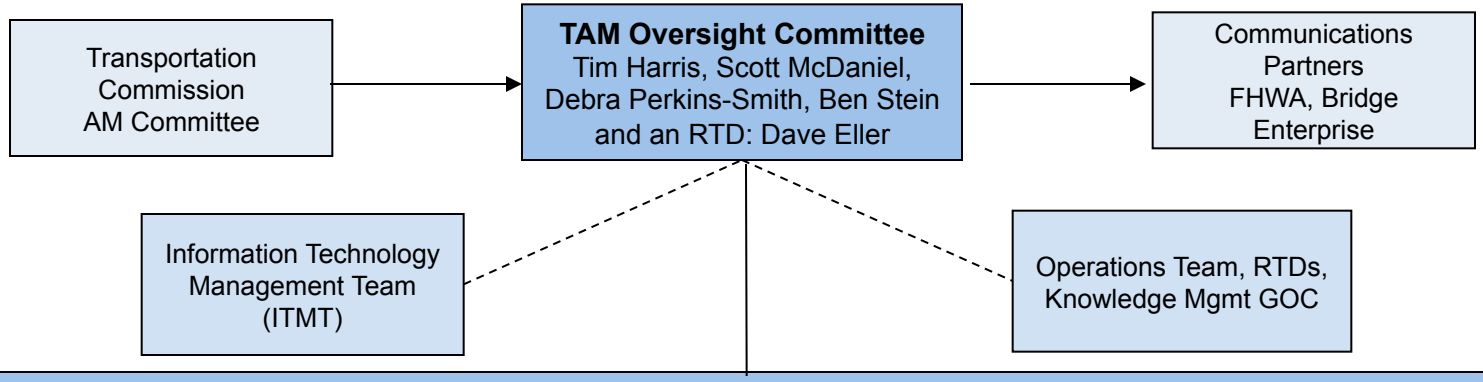
Investment Tool: MAMS



Barriers to Implementation

Communication

CDOT Transportation Asset Management (TAM) Structure



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Pavement	ITS	Region 2	Region 5				Region 5	OFMB	
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DTD TPB				DTD TPB		HQ Traffic Ops	Region rep
				Region 3		DTD TPB	GIS Unit
							TAM Consultant

Communication

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- Asset Financial Management
- TAM Plan and MAP 21
- Asset Data Management

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Transportation Asset Management - Overview

by Suresh, George — last modified Mar 07, 2013 11:52 AM

Asset Management

Transportation Asset Management (TAM) is *a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization with the objective of better decision making based upon quality information and well-defined objectives.* (AASHTO Transportation Asset Management Guide: A Focus on Implementation, 2011).

TAM implementation involves answering five core questions:

- What is the current state of our assets?
- What are our required levels of service and performance delivery?
- Which assets are critical to sustained performance delivery?
- What are our best investment strategies for operations, maintenance, replacements, and improvement?
- What is our best long-term funding strategy?

In some areas such as pavement and bridges, CDOT staff has tracked the inventory and condition of these assets for many years. Other assets have varying levels of data available. There are two main drivers behind the increasing focus on asset management:

1. With the passage of the MAP-21 federal legislation, CDOT is now required to develop a risk-based asset management plan.
2. With revenues decreasing over time there is a real need to identify the most cost effective way to spend our limited dollars.

Contact Information

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General Professional V
Information Management Branch, DTD
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Agenda

CDOT Asset Management Update

Multi-Asset Management System: Adding Buildings to analysis.

Pilot Project Task Force: Innovative Asset Management projects.

Risk-Based Scoring: Focusing on under-served assets.

Risk-Based Asset Management Plan: Kick off at end of March.

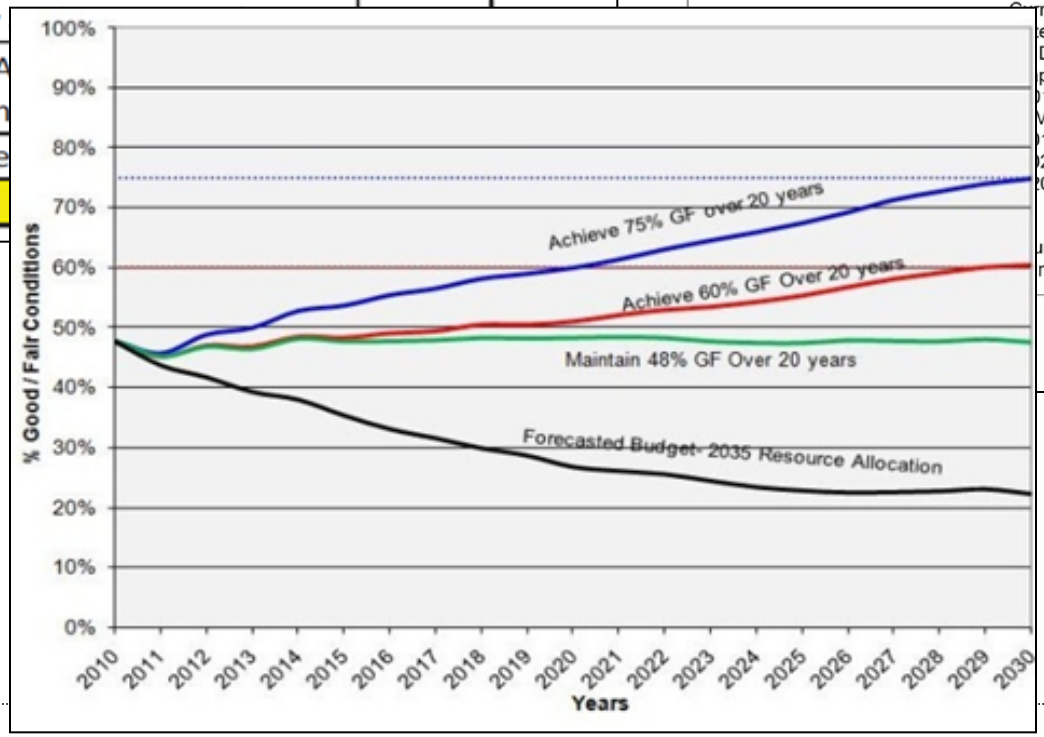
Responsible Acceleration of Maintenance and Partnerships

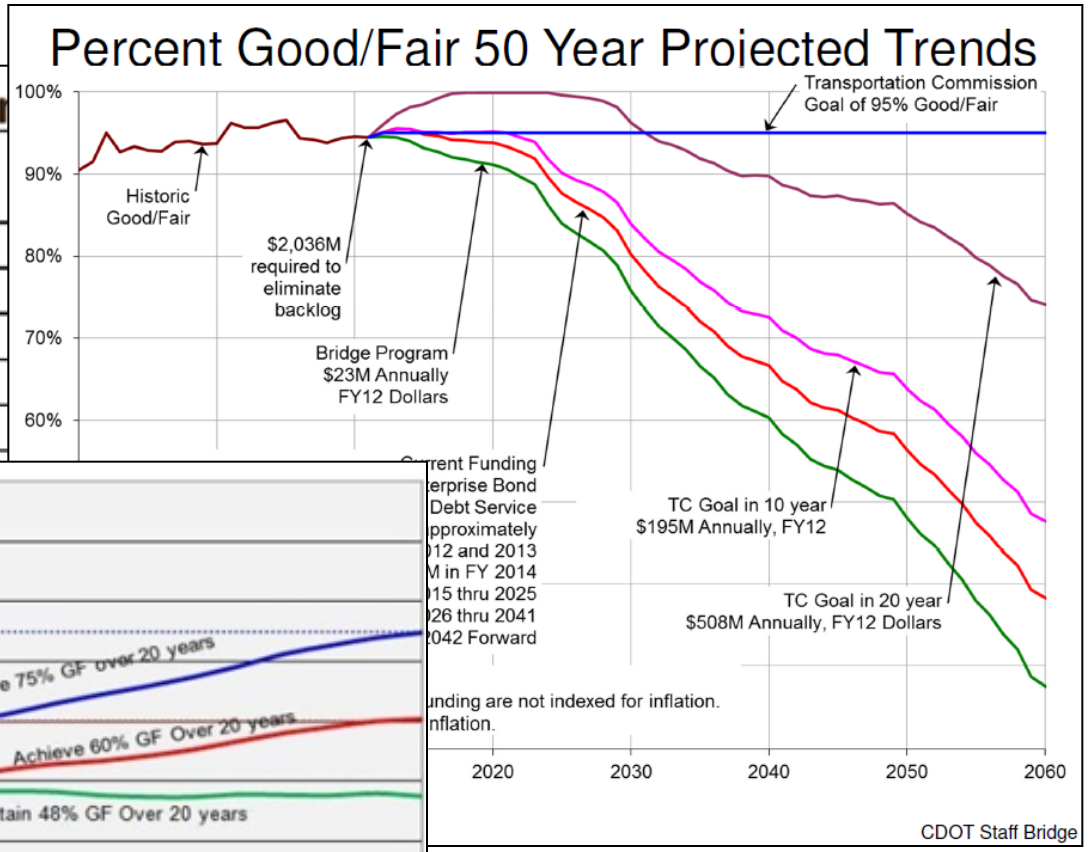
~$300 million / year acceleration

FY13 Budget Workshops - Last Year

FY 2013, Scenario 3 Maintain

Planning, Scheduling and Training	C
Roadway Surface	C+
Roadside Facilities	C
Roadside Appearance	C
Traffic Services	C-
Structure Maintenance	B-
Snow	
Rest A	
Groun	
Tunne	





RAMP Criteria

Summary of Eligible Programs:

For an asset management program to be RAMP-eligible, it must:

Be able to demonstrate with a quantified performance measure the benefit of additional investment.

RAMP Criteria

Summary of Eligible Programs:

For an asset management program to be RAMP-eligible, it must:

Possess an existing or developing asset management system able to establish a performance target *and* minimize cost in achieving that performance target.

RAMP Criteria

Summary of Eligible Programs:

For an asset management program to be RAMP-eligible, it must:

Distinguish between annual maintenance activities *and* capital preservation and replacement.

Crack filling and data gathering, for example, are not RAMP-eligible activity.

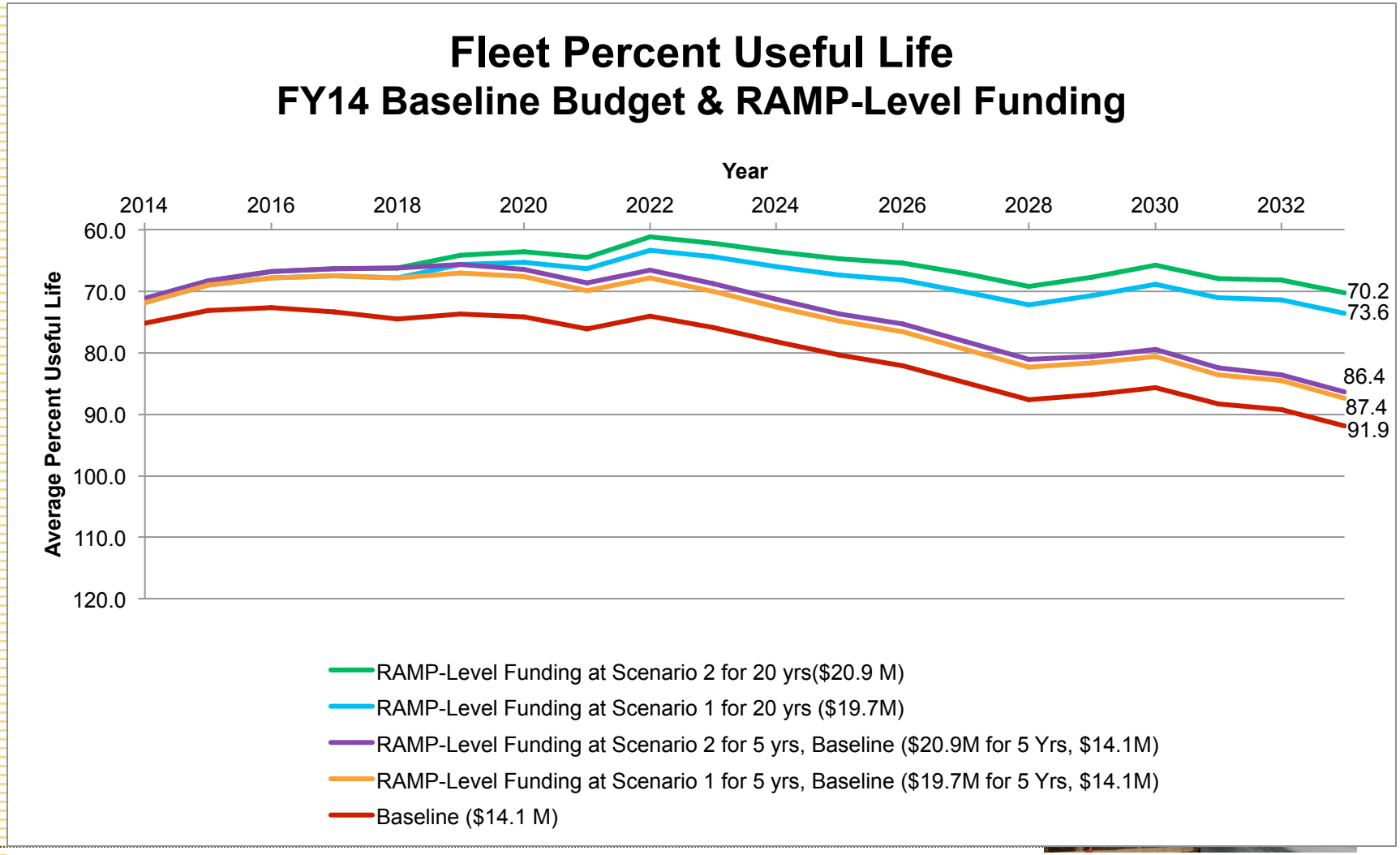
RAMP AM Programs

RAMP Eligible Programs	RAMP Ineligible Programs
Surface Treatment	MLOS: Roadway Surface
Bridge	MLOS: Traffic Services
Fleet	MLOS: Tunnels
ITS	MLOS: Structures
Tunnels	Bridge: Walls
Culverts	
Rockfall Mitigation	
Buildings	

Fleet Asset Management

Analysis Assumptions

- Based on % useful life
- 3.0% inflation rate
- Timeframe: 20 years

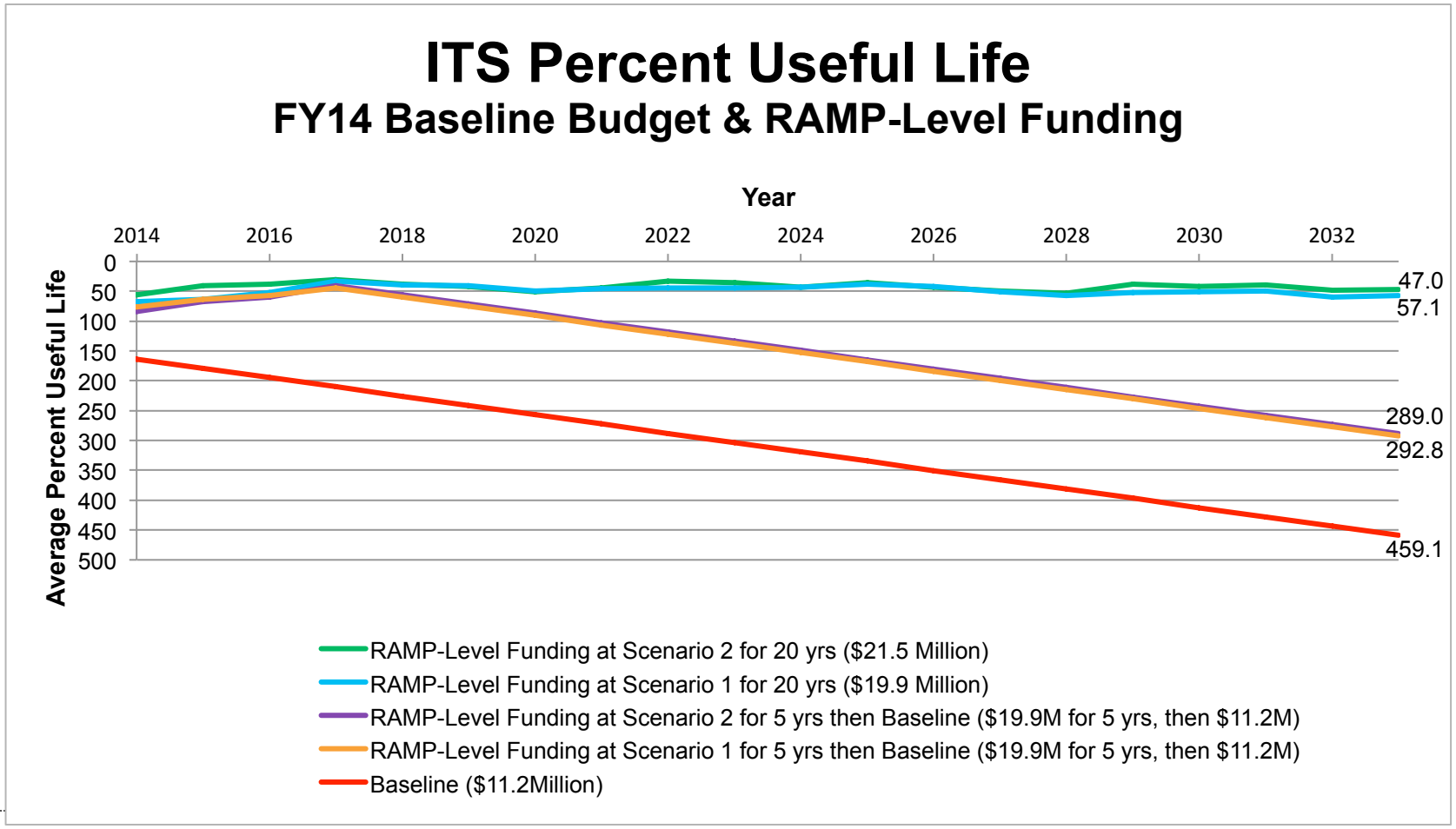


Note: a previous fleet analysis included $0 in the first year to address the lag for purchasing equipment; this graph funds all years for consistency in this slide deck.

ITS Maint., Ops, Replacement

Analysis Assumptions

- Y-axis based on mfg. spec. modified by actual experience
- Timeframe: 20 years, 3% inflation
- Assumes July 1 expenditure
- Excludes new capital requests
- Excludes growth of capital inventory

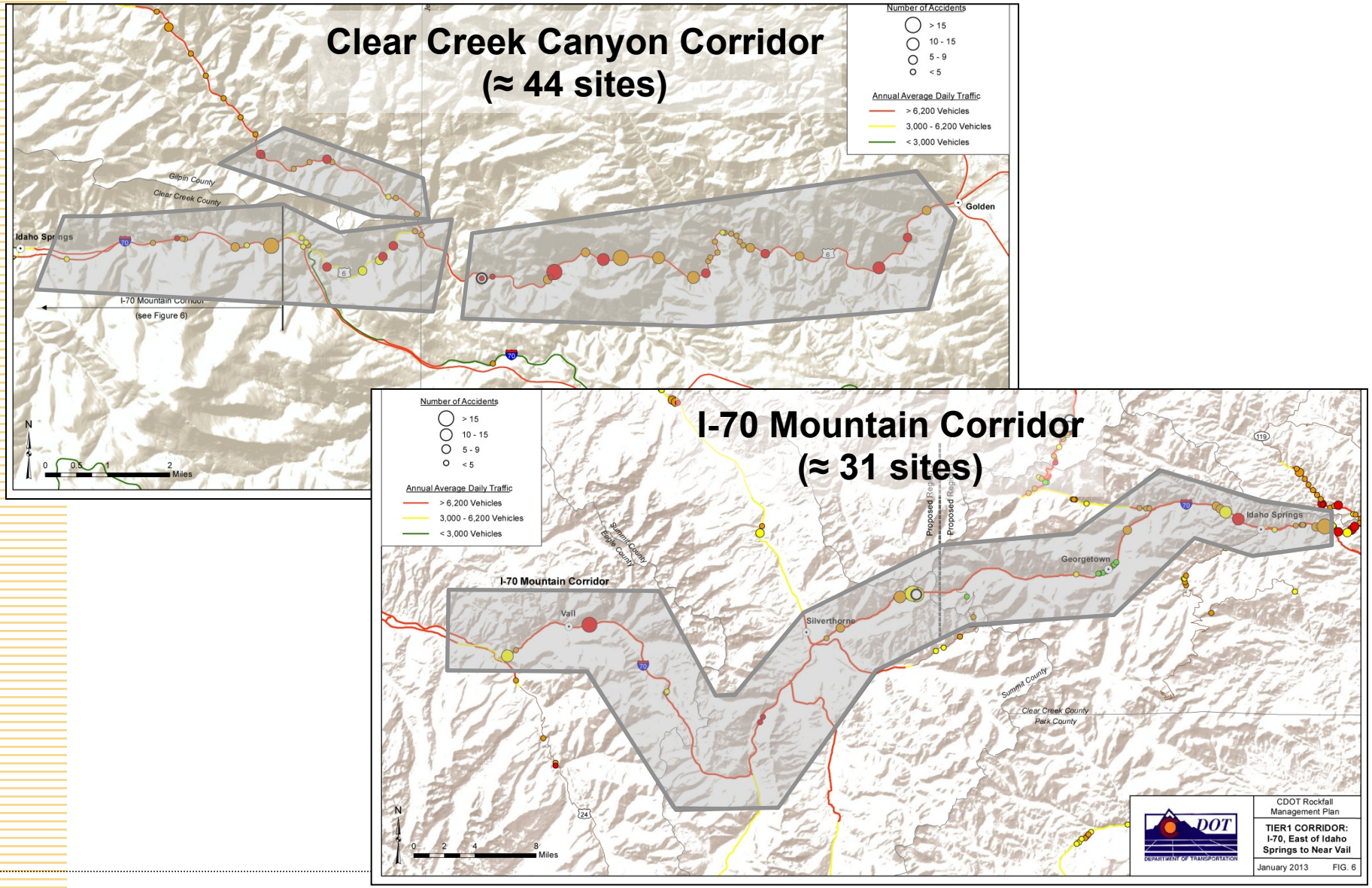


Culverts

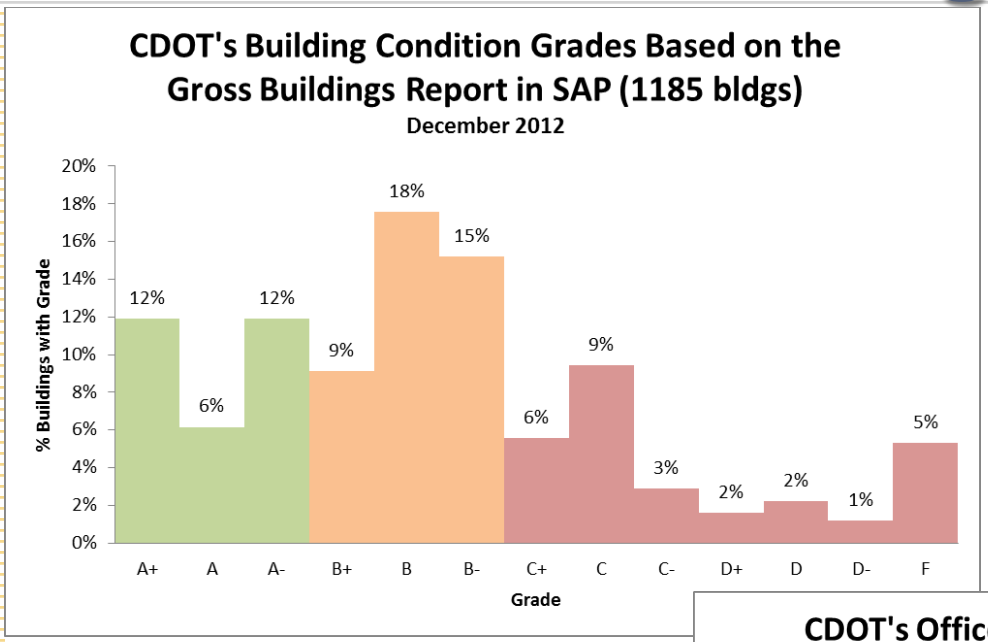
FY14 Culverts	
FY14 Baseline without RAMP:	**FY14 Baseline with RAMP:**
$5.6 Million	**$10.9 Million**
Repair or Replace ~15 Culverts	**Repair or Replace ~29 Culverts**
Colorado: 6,100 minor culverts and minor bridges	
Backlog for essential repairs: 209	
Average estimated repair cost: $370,000	

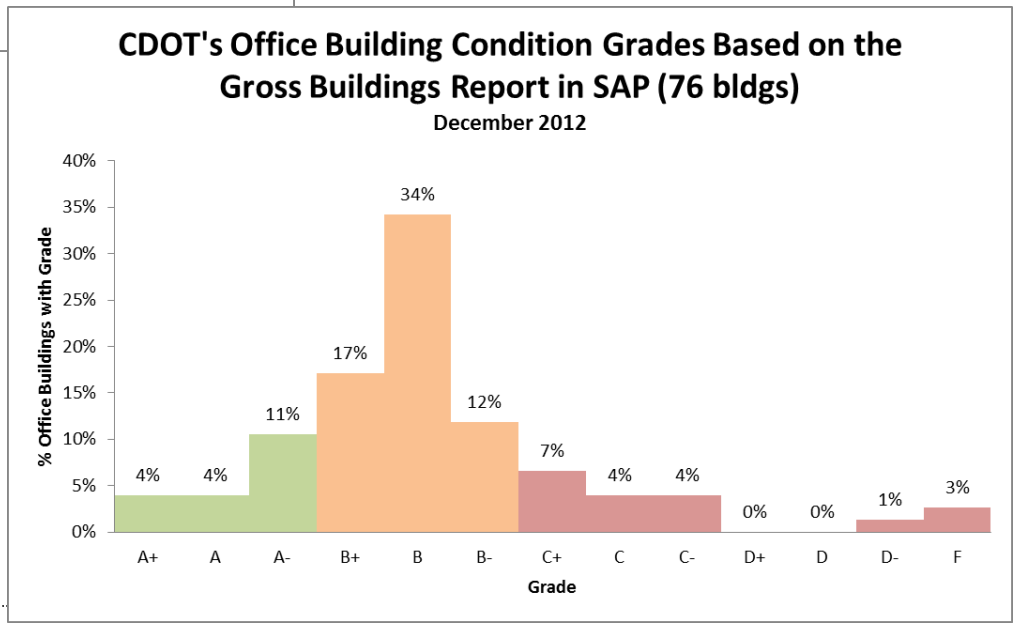
Note: The culverts that are within the same location as active CDOT projects will be addressed first, and the remaining culverts will be addressed through a statewide culverts project

Corridor Mitigation



Buildings





Source:

SAP Gross Buildings Report (ZF94), December 2012

Asset Management Business Models

and Barriers to Implementation

AASHTO & FHWA

Scott Richrath, Transportation Performance Branch Manager
Colorado DOT

Scott.richrath@state.co.us

TIMS:
Embedding Asset Management in the Information System

Webinar: March 13, 2013

AASHTO & FHWA Asset Management Business Models & Barriers To Implementation

Presenter:
Touraj Nasseri PhD, PEng
Alberta Transportation

Alberta Transportation

TIMS is the Acronym for:

Transportation Infrastructure Management System

- TIMS is an integrated system of web applications designed for the life cycle management of Alberta's Provincial Highway Assets.

Alberta Transportation

Alberta Transportation

Vision:

To Be Recognized by Stakeholders &Transportation Sector for Excellence in Transportation Infrastructure Management

Mission:

Delivering Lifetime Optimum Transportation Asset Performance:
safe, effective, efficient, environmentally sound & innovative Infrastructure

Business Drivers:

- Large Scale Downsizing-Same Mission
- Major Changes in Business Model (Outsourcing)
- Many legacy applications that were inefficient and non – responsive to business needs
- Preservation, enhancement and value maximization of Knowledge Assets (information and human capital)

- **TIMS Mission**

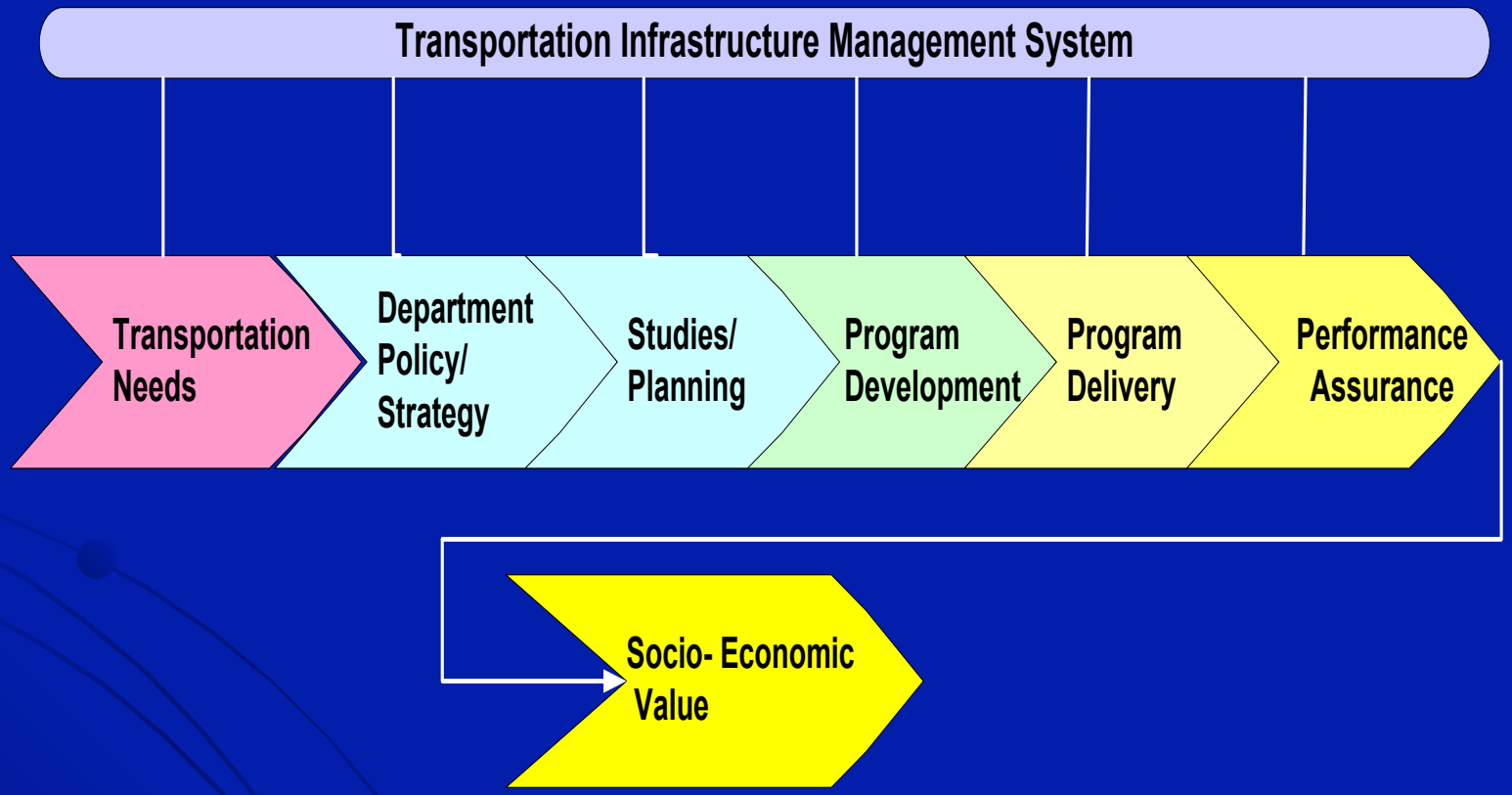
  Harnessing Information & Technology For Maximizing the Lifetime Socio-economic Value of Investments in Transportation Assets.

TIMS

Infrastructure Asset Analysis & Management Scope

- What are the locations, attributes, conditions, capacities and functions of the existing assets
- What new or enhanced assets are essential to meet expected socio –economic needs?
- What assets or asset enhancements would deliver the highest socio-economic value.
- What is the best time to execute the investment decisions
- What are the lifetime performance impacts of the investments in each asset creation or enhancement?
- Develop and manage programs that result from asset analysis
- Measure the real impacts
- Learn from performance measurements and introduce change

TIMS in Transportation Value System



Alberta's Highway Network Assets

- 30,000km of Roads
- 4000 Bridges & Related Structures
- 1m Supporting Objects, Structures & Features

- Value ~ $ 70b
- Annual Capital Investment ~ $ 1.5b
- Annual Operations Budget ~ $ 0.4b

TIMS Scope

- Web-Based Integrated System
- Business Critical Information
- Decision Analysis Applications
- Program Management Applications
- Integration or Retirement of Legacy Systems
- Integrated Knowledge Transfer
- Transactional & Transformational System
- Accessible to Staff and Contractors

What Can TIMS Do?

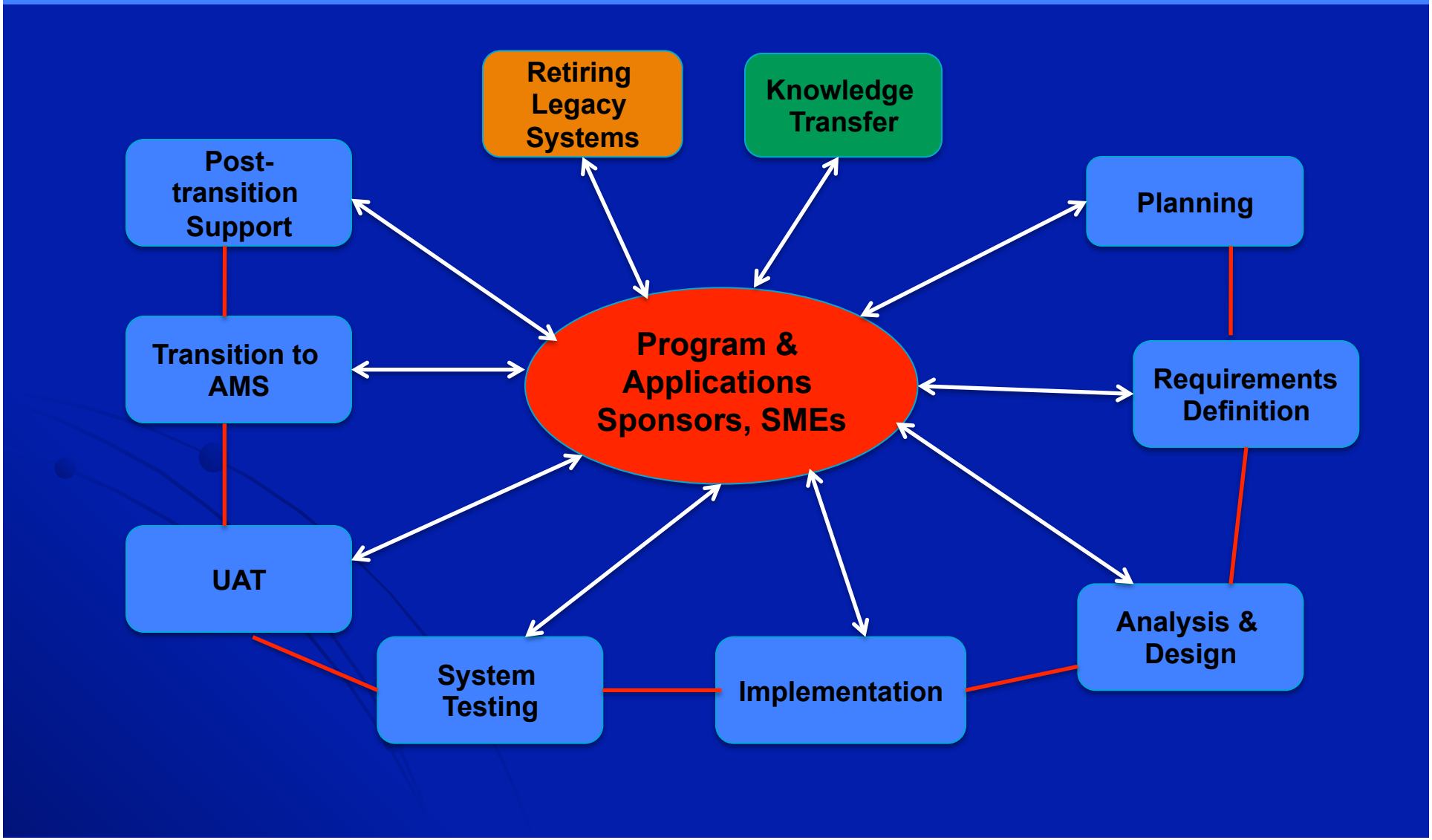
- Creates a single, comprehensive, current and reliable data/information /analytics-accessible to all staff and contractors working on AT projects.
- Enables efficient collection, preservation ,and updating of business-critical information
- Enables rigorous engineering-economic-environmental evaluations of projects & programs
- Enables collaborative problem solving and project execution
- Provides an effective Web-based learning tool

TIMS

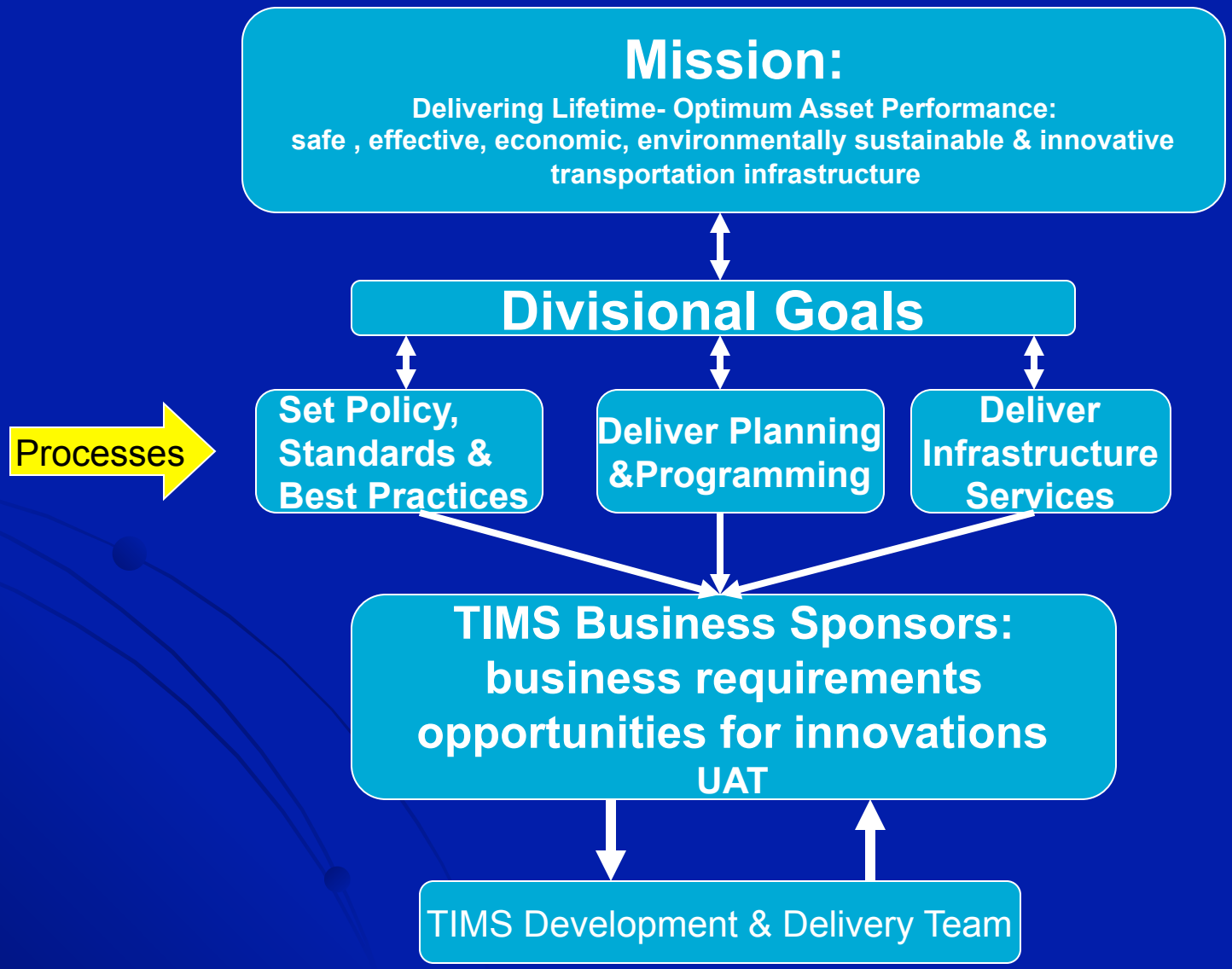
Why Develop TIMS in House?

- Capturing tacit & explicit knowledge of the staff in the software.
- Alignment of people, processes, practices with technology
- Opportunity to improve prevailing processes and practices through TIMS
- Concurrent training and richer learning experience for the business

TIMS Program
Integrated Applications Development & Deployment Management

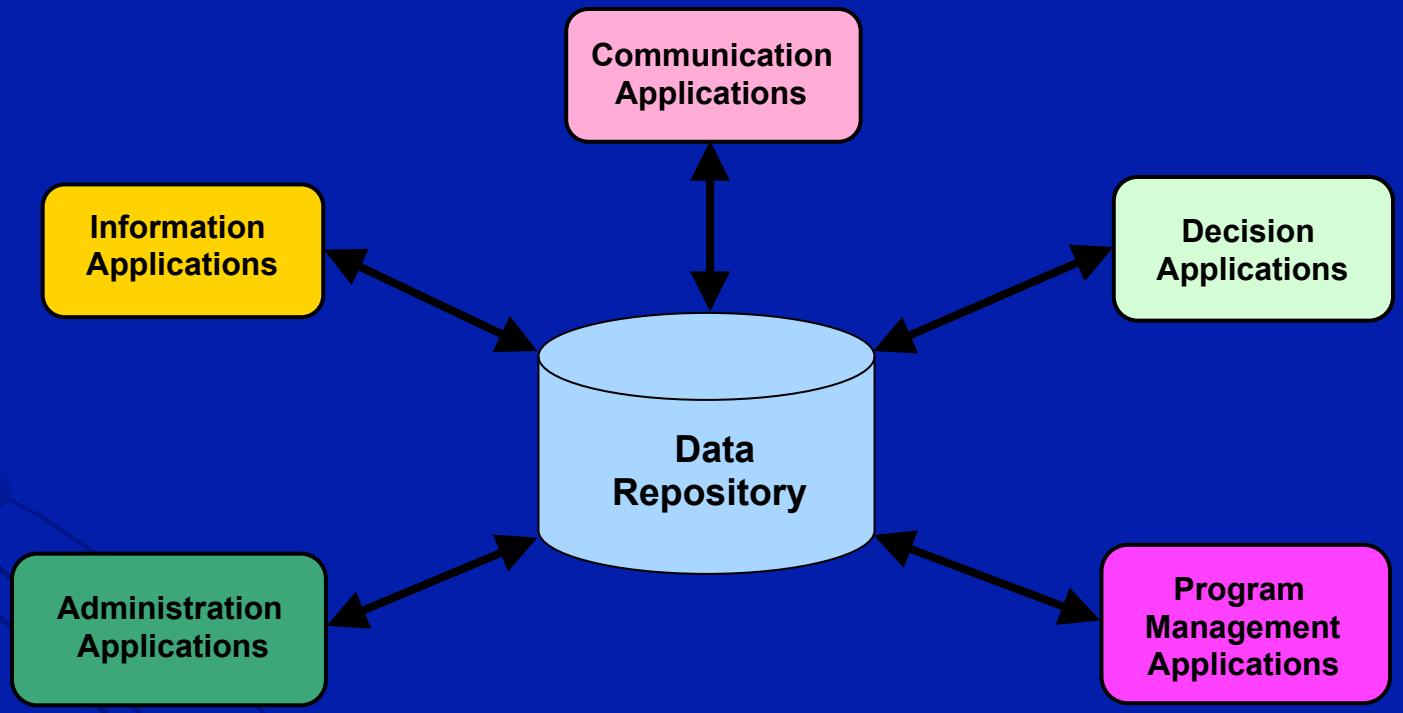


TIMS Model: Integration with Business Strategy

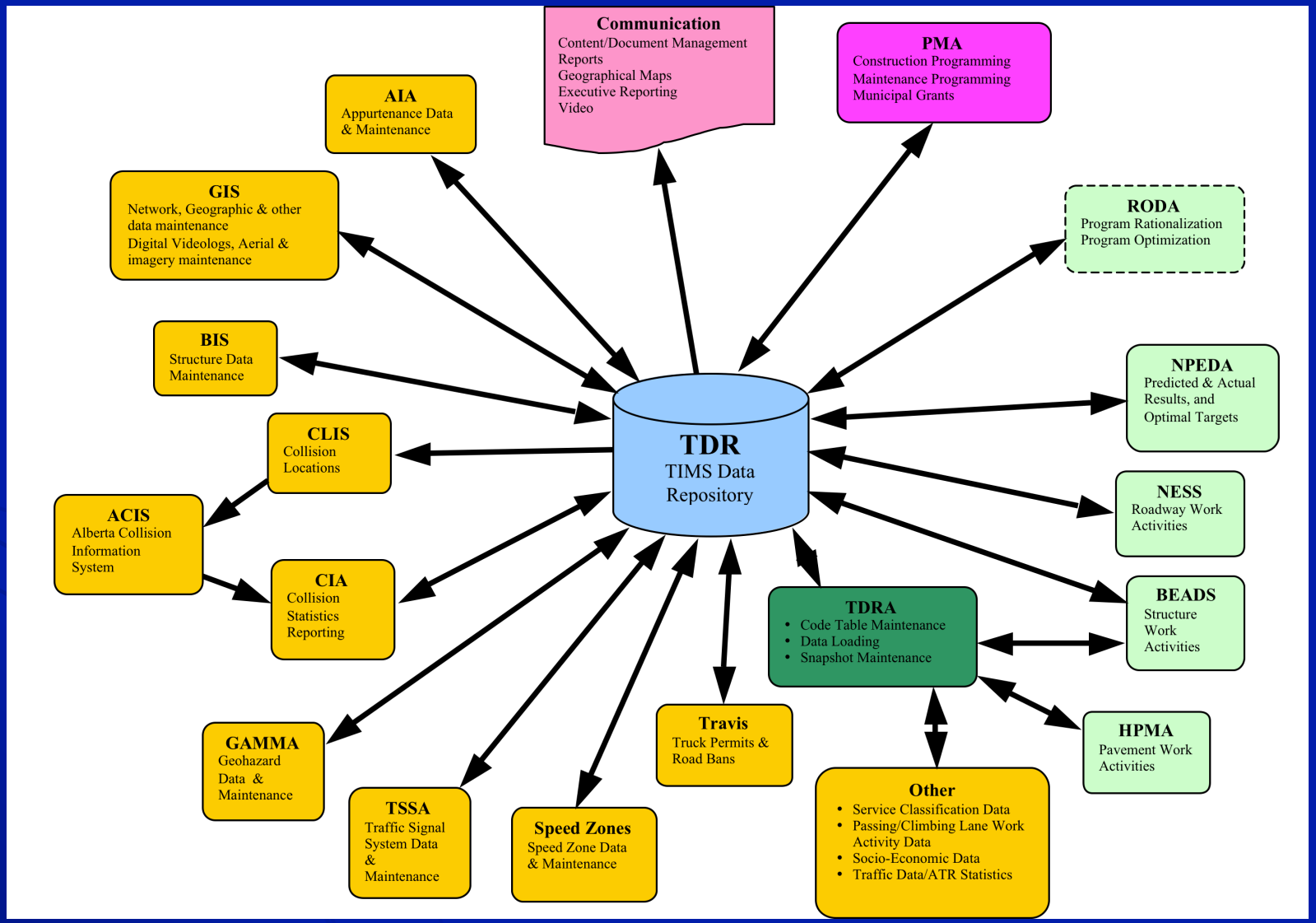


TIMS

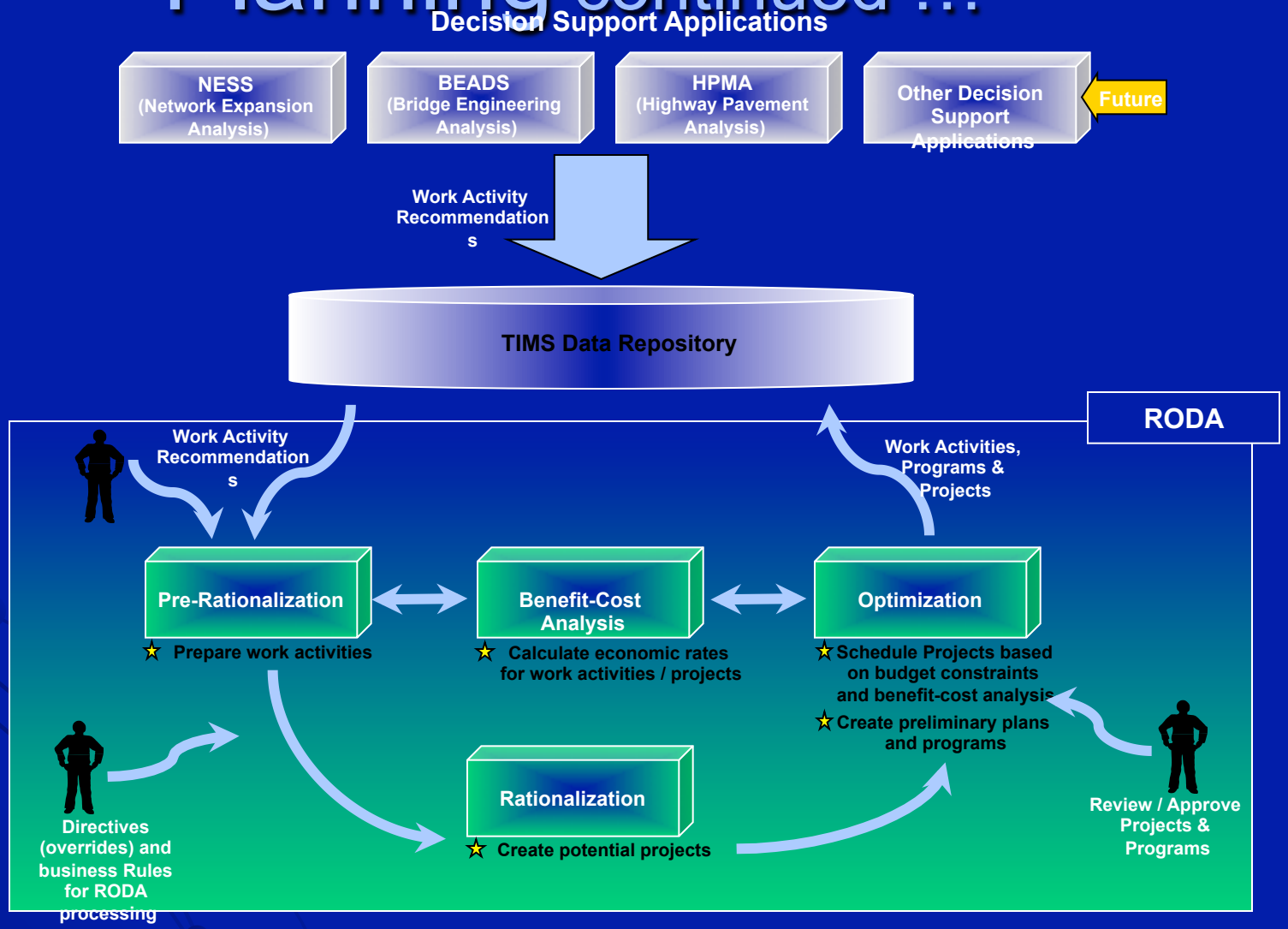
TIMS Software Applications



TIMS Applications



Planning continued …



RODA packages the work to gain efficiencies in Delivery, applies Benefit-Cost Analysis to estimate the value of delivering the work, and provides capabilities to schedule the work according to various budget scenarios

- *TIMS*

Bridge Information System

- Description: **BIS contains Inventory and Inspection data of all structures on Public Roads outside Urban Areas. The city of Edmonton also uses this system for managing their structures.**

- **Functionality:**
  - **Record inventory of structures (bridge, bridge culvert, sign structure, ferry, watercourse training structure, structure, low level crossing, retaining wall)**
  - **Initiate and record inspections (bridges, bridge culverts, sign structures)**
  - **Maintain Inspector list (training history, training requests)**
  - **Contractor and municipality access via extranet portal**

- *TIMS*

Network Expansion Support System:

Functionalities

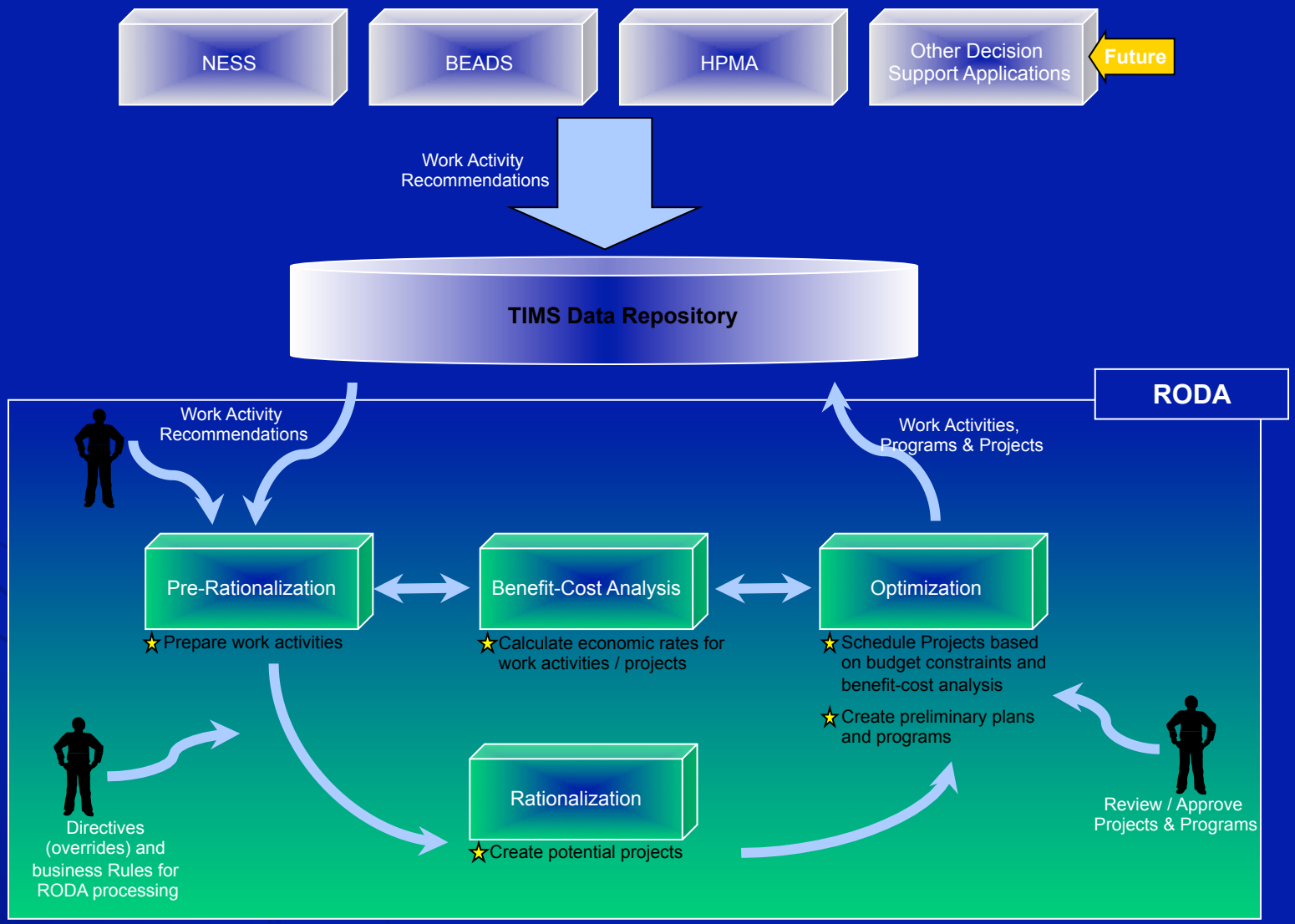
- Based on safety and geometric analysis, recommend work activities: grade-widening, four-laning, curve improvements, traffic signals and intersection lighting.
- Use historical collision data to highlight roads/ intersections that exhibit poor collision performance
- Predict network requirements based on traffic growth.
- Publish road assessments and work activity recommendations to TDR

RODA Functions

- Provides automated “packaging” of Work Activities into potential Projects based on pre-defined business rules
  - Proximity of Work Activities to each other
  - Work Activities needed in a similar time-frame
  - Total Cost of the Project
  - Compatibility of Work Activities
- Provides the ability to visually see Work Activities and Projects on a map and obtain detailed information about the work
- Estimates the cost and material quantities for primary Work Activities
- Performs automated Benefit-Cost Analysis on primary Work Activities

TIMS

Rationalization & Optimization



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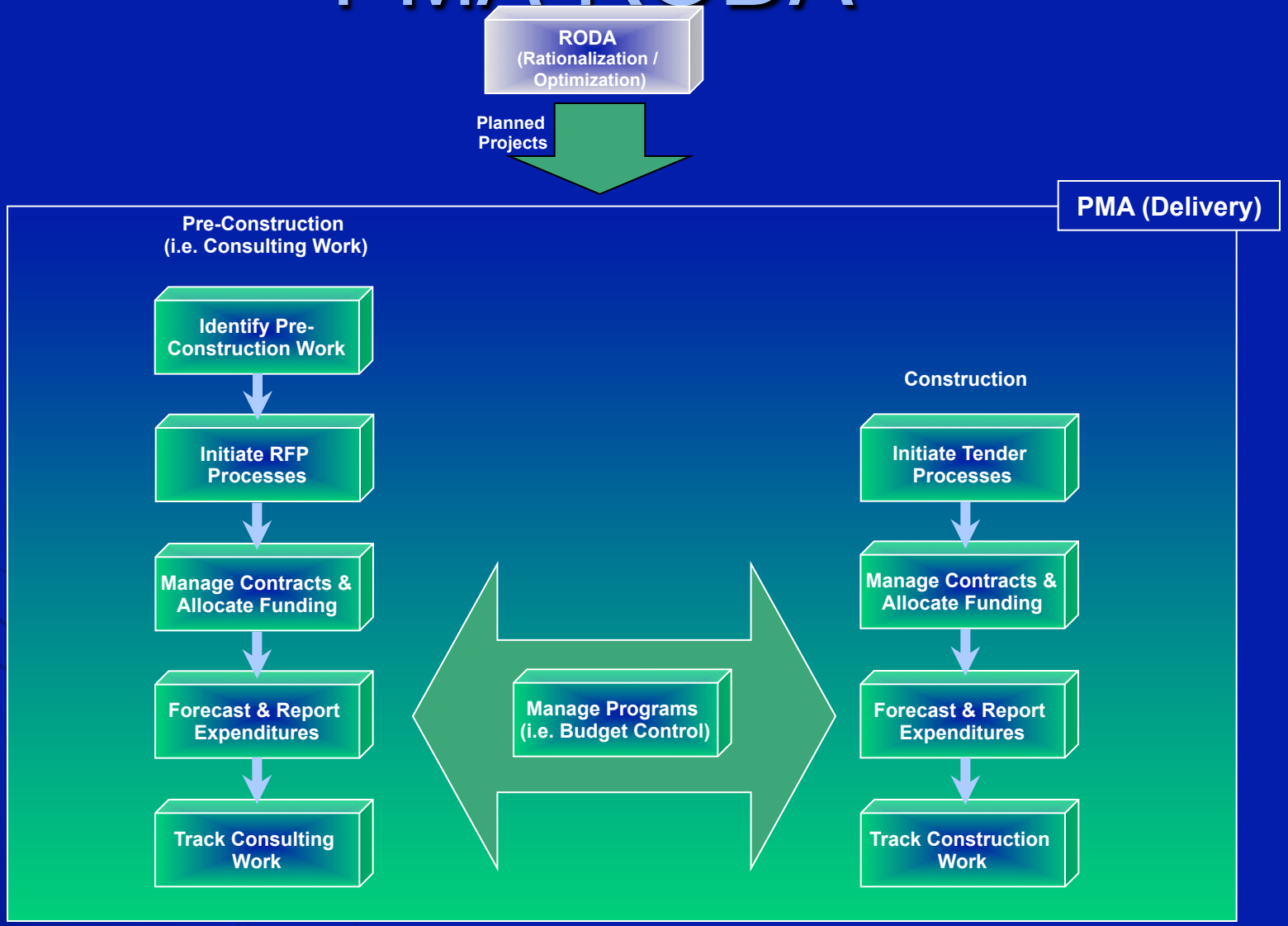
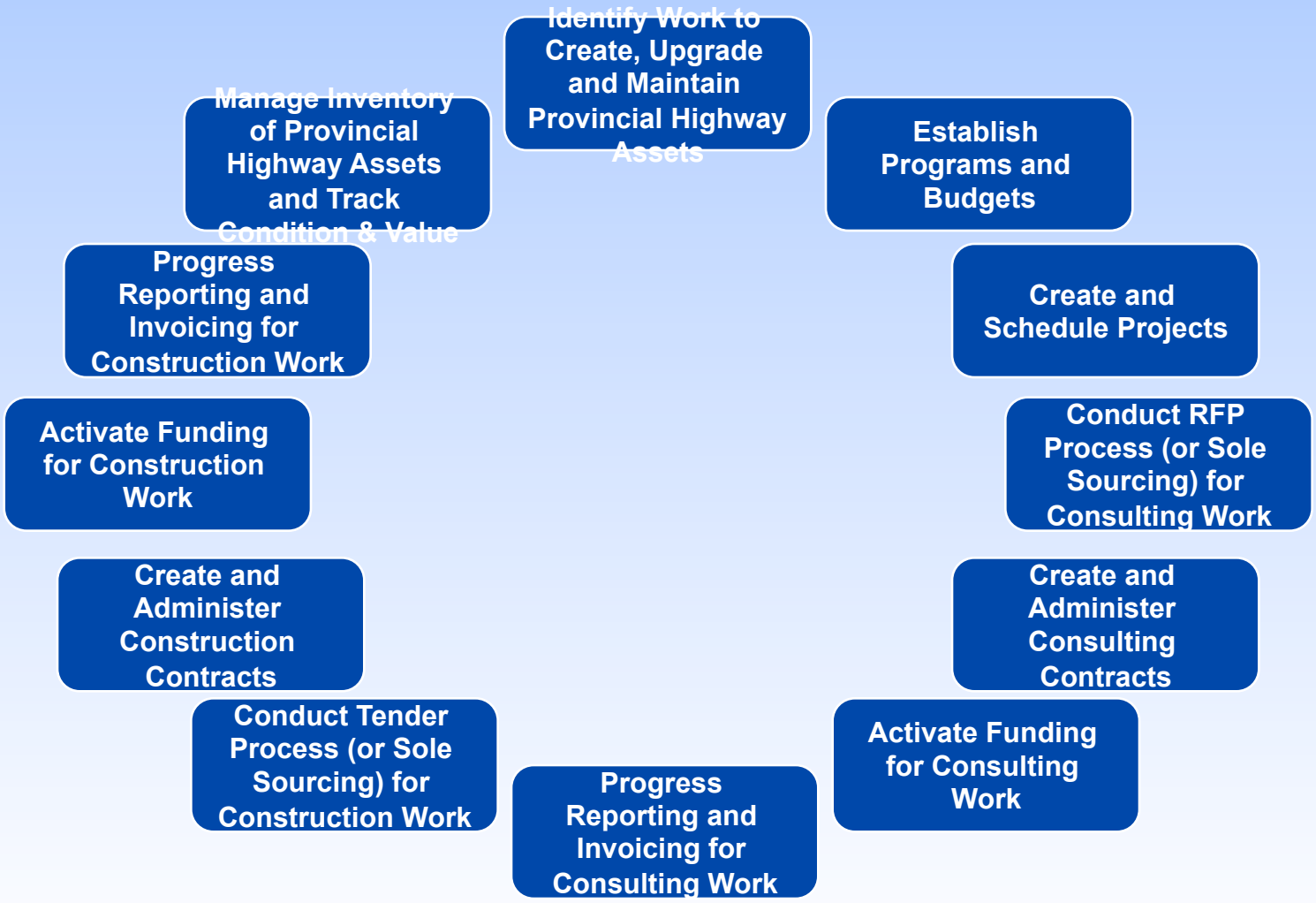
PMA-RODA



PMA (Delivery) tracks and manages the delivery of provincial highway infrastructure work based on the established programs

Business Processes that PMA Supports



Core PMA Functionality

Future Development

- Enhancing data management and decision applications based on feedback from users and best practice benchmarking
- Developing a talent repository to complete transformation into a knowledge system
- Integrating unstructured data & textual analytics
- Completing risk analysis and management applications
- Refining the investment decision models to account for uncertainties and externalities
- Incorporating evolving technological innovations – apps for mobile devices.

TAM Business Models NYSDOT's Experience

Presented: 3/13/2013

By: Brad Allen, P.E.

NYSDOT Maintenance Program Planning Bureau

Transportation essential to a vibrant economy and sustainable society










113,000 highway miles

130 billion vehicle miles annually

17,400 bridges

130 public transit operators

3,500-mile rail network

485 public and private aviation facilities

12 major public and private ports

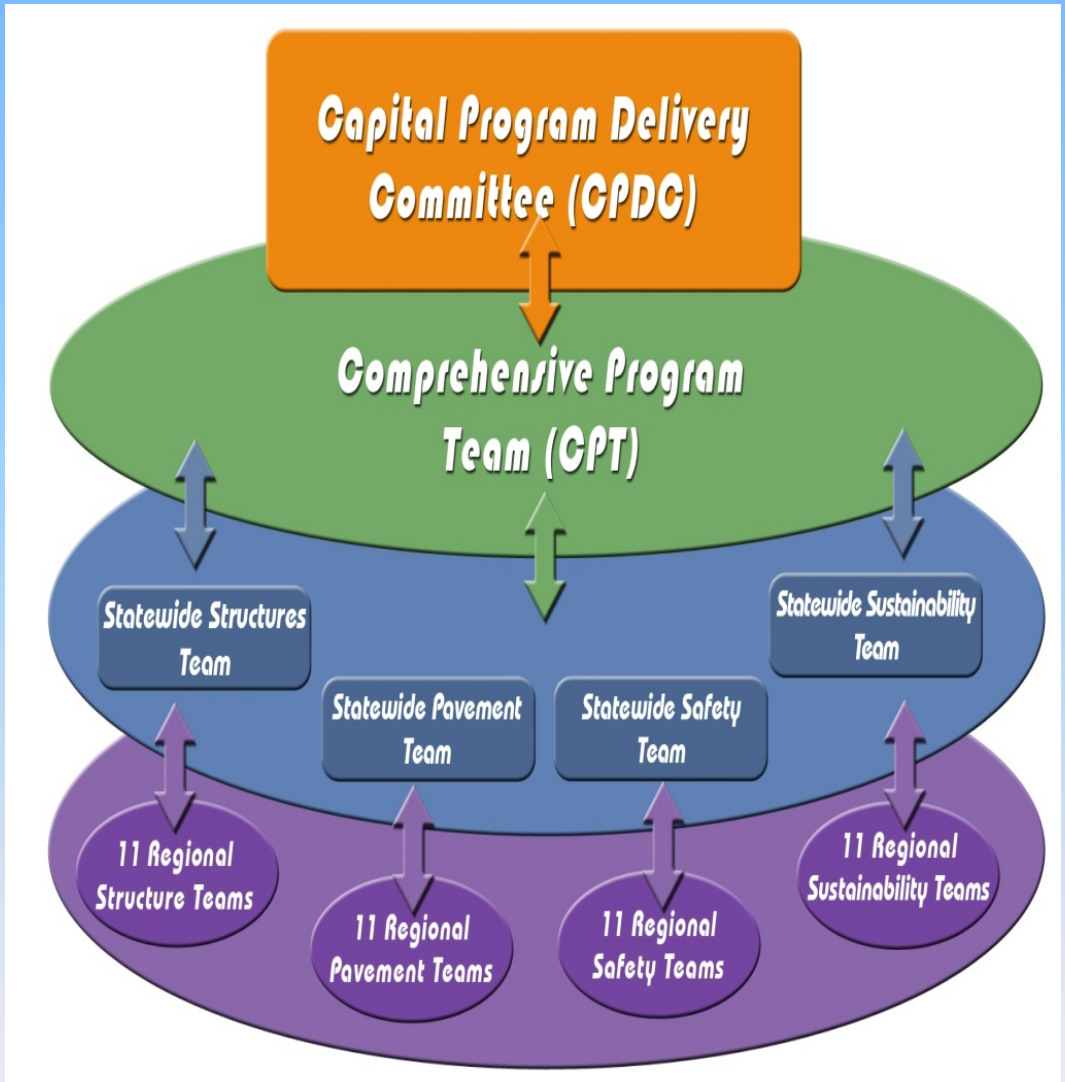
How to Implement TAM?

- Establish an enterprise performance management framework…
- Build robust inventory system and collect comprehensive asset data…
- Produce plan or report to comply with a mandate…

A Practical Approach to TAM

- Focus on improving the quality of investment decisions
  - Impact conditions; don't just report on them
- Leverage existing data and tools
  - Minimize initial investment and implementation time
- Work collaboratively across the bureaucracy
  - Break through organizational cultures and data stovepipes
- Employ principles of TAM from AASHTO guides
  - Start with what we have and work to improve
- Systems approach

NYSDOT Asset Management Framework



Comprehensive Program Team

Rod Sechrist – TAM Champion

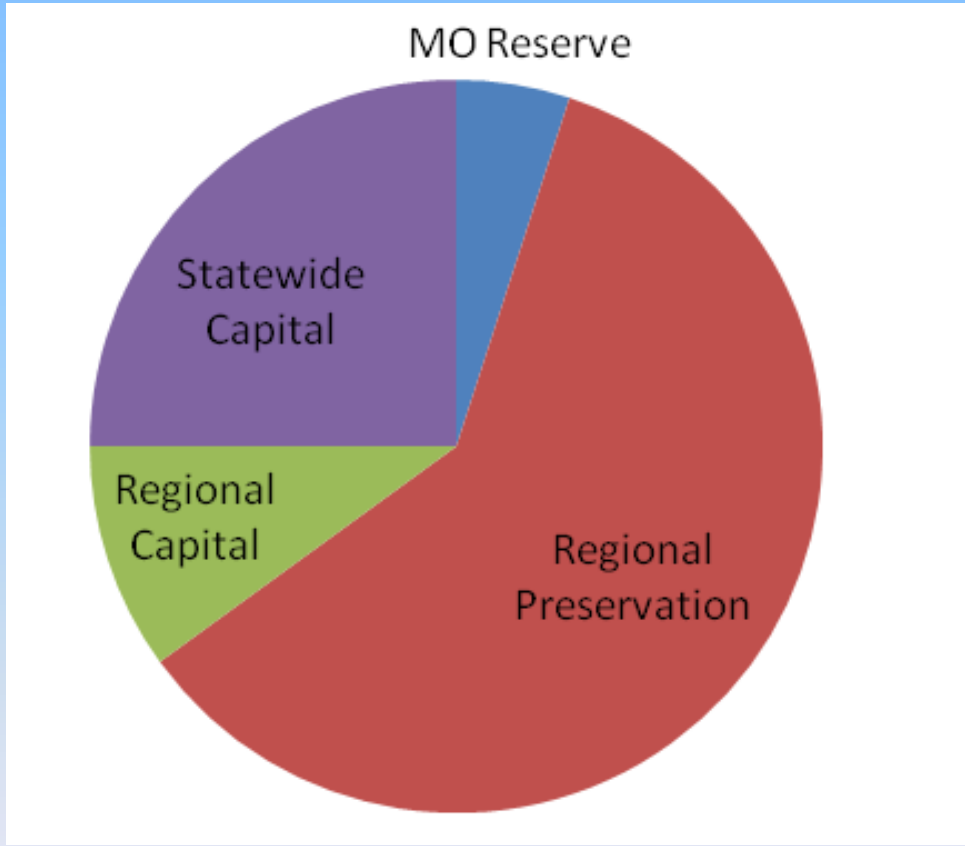
- Chief Engineer
- CFO
- Program Management
- Maintenance
- Structures
- Pavement Manager
- Policy & Planning
- Multi-modal Planning
- Regional Directors (2 of 11)
- Sustainability
- Traffic & Safety
- Operations

CPT members are executives and high-level managers

Forward Four Guiding Principles

Apportion Funds to Direct Investment

- 60% - Regional Preservation Allocation
- 25% - Statewide Capital Prioritization*
- 10% - Regional Capital Allocation
- 5% - Discretionary Reserve



* System Renewal & Strategic Enhancement

2012 STIP Update Highlights

Preservation

- Allocations by need
- Limitations on use
- Driven by condition
- 5-year program designed to optimize conditions in year 10
- Modeled on “loaded” costs

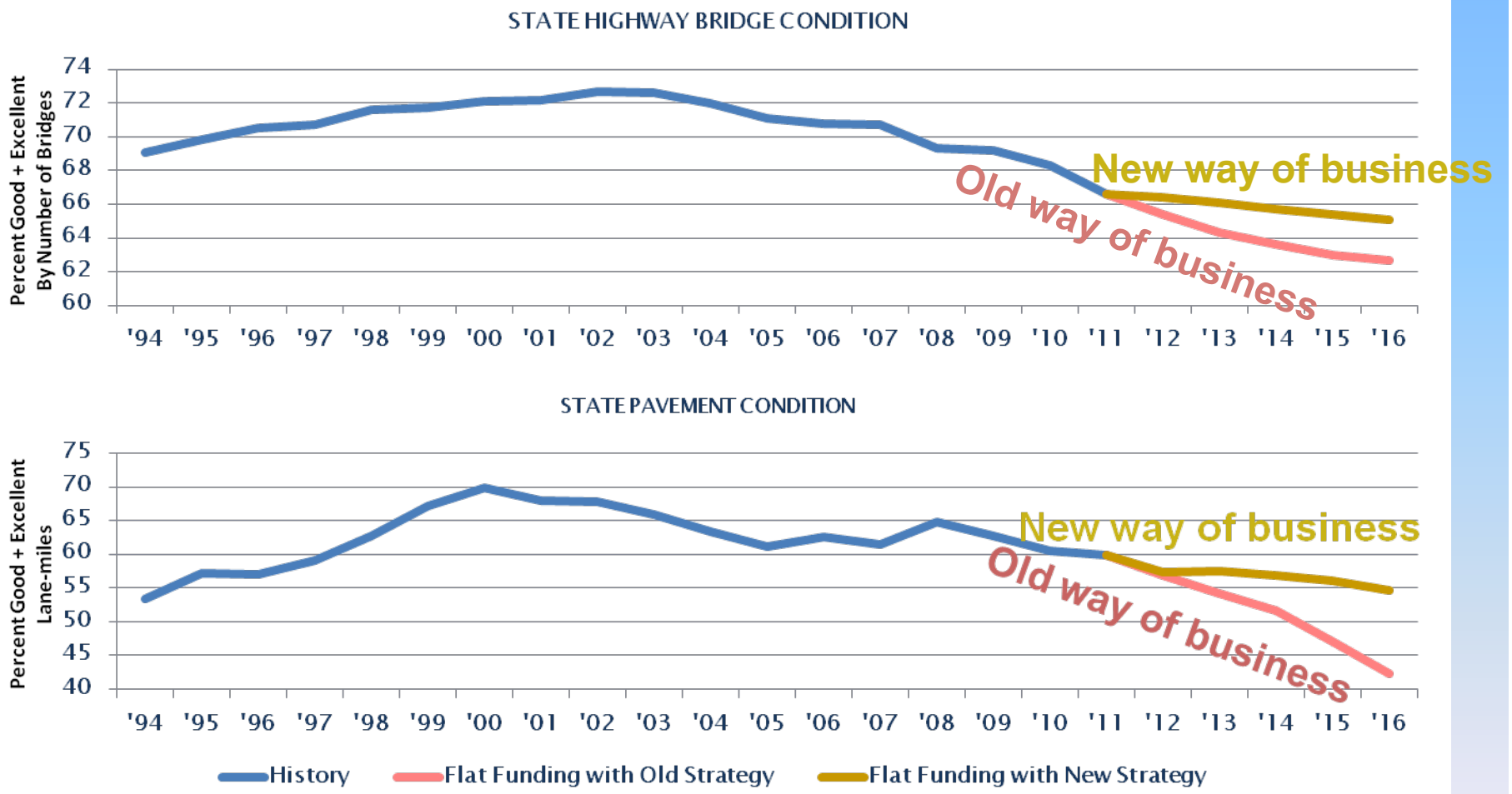
Beyond Preservation

- Small apportion Regionally controlled
- Statewide competition in 4 areas
  - Bridge
  - Pavement
  - Safety
  - Sustainability
- Standard submission

Statewide Prioritization Summary

- Statewide Capital Prioritization
  - System Renewal
  - Strategic Enhancement
- Bridge/Pavement Index
  - Quantitative, data driven.
  - Based on condition and function
- Asset Team/CPT Review & Selection
  - Asset Team technical review and prioritization
  - CPT balance and find synergies across programs
- Executive/CPDC Approval
- MPO Programming

Projected Outcomes



So What's next

- Improve integration of Capital and Maintenance
- More robust pavement and bridge tools
- Cross-program trade-off
- Organizational home for TAM
- Corporate Performance Management Framework
- Incorporating customer expectations and LOS definitions
- Develop a TAMP compliant with MAP-21

EAMP TIME LINE

APR 2013	MAY 2013	JUN 2013	JUL 2013	AUG 2013	SEP 2013	OCT 2013	NOV 2013	DEC 2013	JAN 2014

April 2013, Start Analysis for Processes, Requirements and Implementation SOW's

1 1 1 1 2 Pavement Management (4 Weeks Duration)

2 3 1 1 2 Bridge Management (8 Weeks Duration)

1 1/2 1/2 2 Cross Asset TradeOff Analyst (2 Weeks Duration)

1 1 1 1 2 Maintenance Management (4 Weeks Duration)

1 1 1 2 Facilities Management (3 Weeks Duration)

1 1 1 1 2 Fleet Management (4 Weeks Duration)

1 1 1 1 2 Safety Management (4 Weeks Duration)

2 1 1 2 Mobility Management (4 Weeks Duration)

1 1 1 1 2 Sustainability Management (4 Weeks Duration)

* Possible to conduct the analysis concurrently, pending business owner overlap and availability.

LEGEND

- Review NYSDOT Legacy System
- Review AgileAssets Module
- Work Sessions
- Draft SOW for Implementation
- Review, Revise and Accept

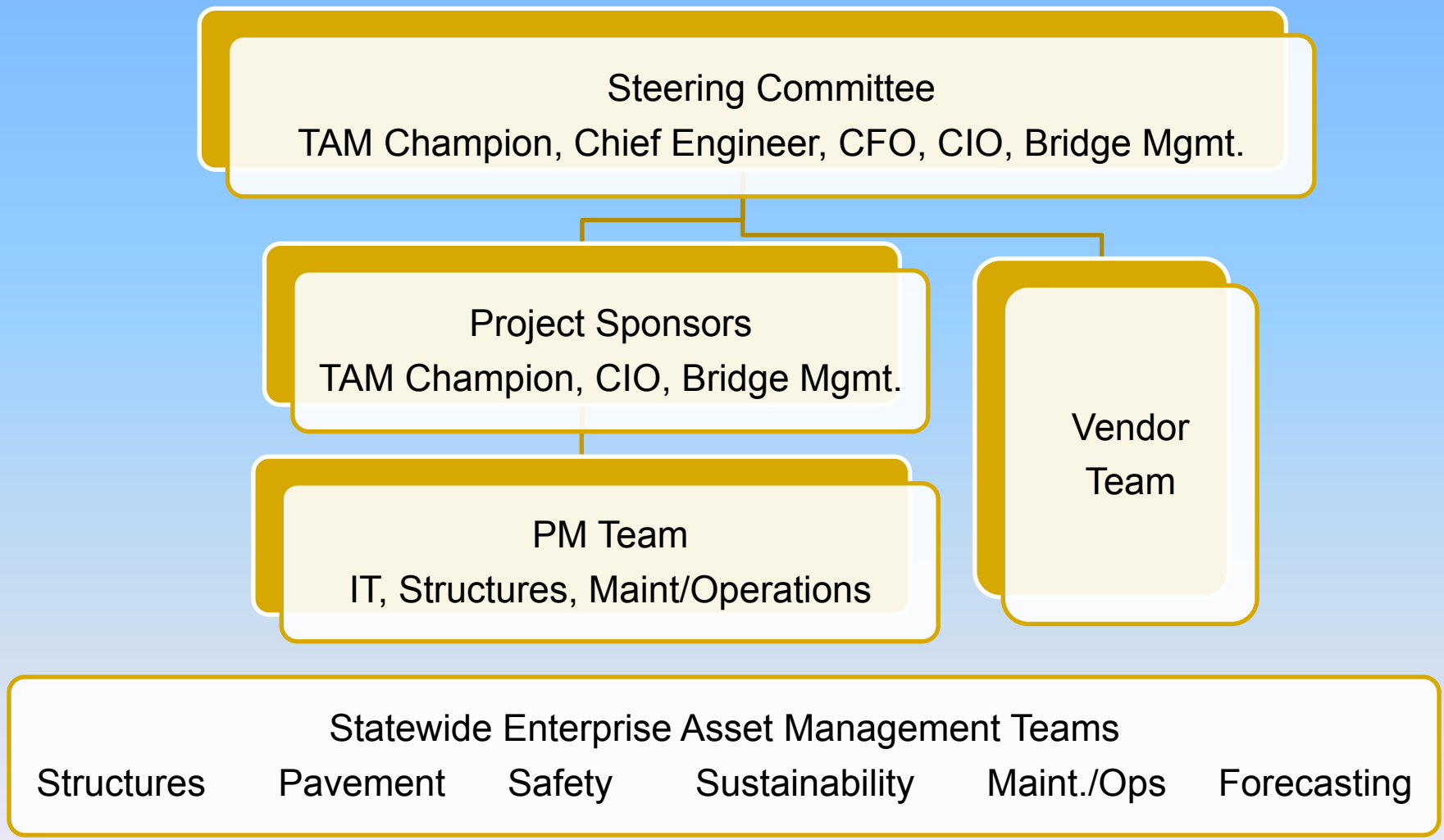
1/2 is a ½ week task

1 is a 1 week Task

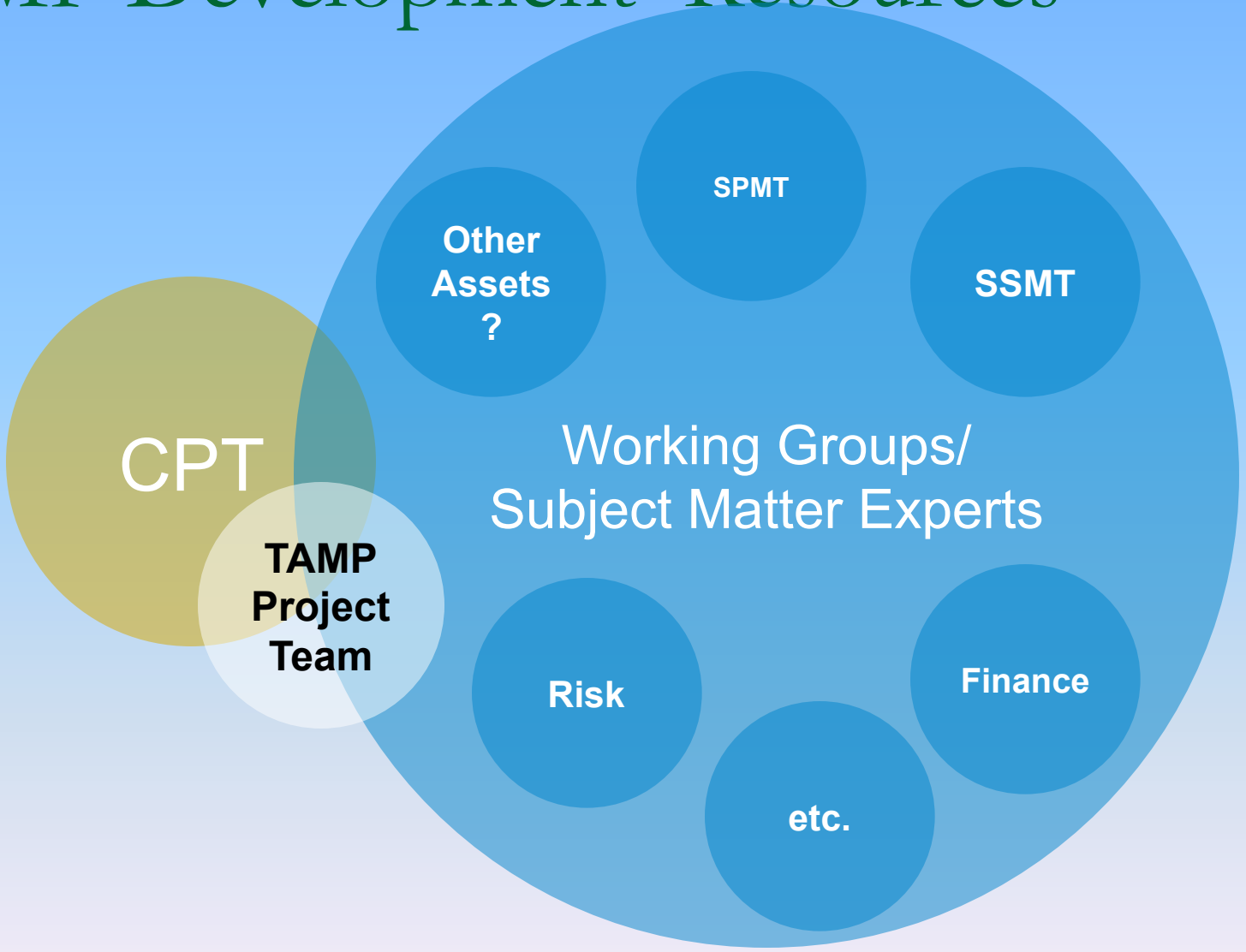
2 is a 2 week Task

3 is a 3 week Task

EAMP Project Org Chart



TAMP Development Resources



Thank You.

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Questions?

- Submit your questions using the webinar's Q&A feature

Next webinar:

Asset Management and Risk Management – 05/08/13, 2:00 PM EST

Save the Dates!

Webinars are scheduled Wednesdays at 2:00 PM EST, beginning December 5, 2012

Announcing the first four webinars in the series:

December 5, 2012 2:00 PM EST – Asset Management and Safety

January 9, 2013 2:00 PM EST – Asset Management and Performance Management

March 13, 2013 2:00 PM EST – Asset Management Business Models and Barriers to Implementation

May 8, 2013 2:00 PM EST – Asset Management and Risk Management

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