

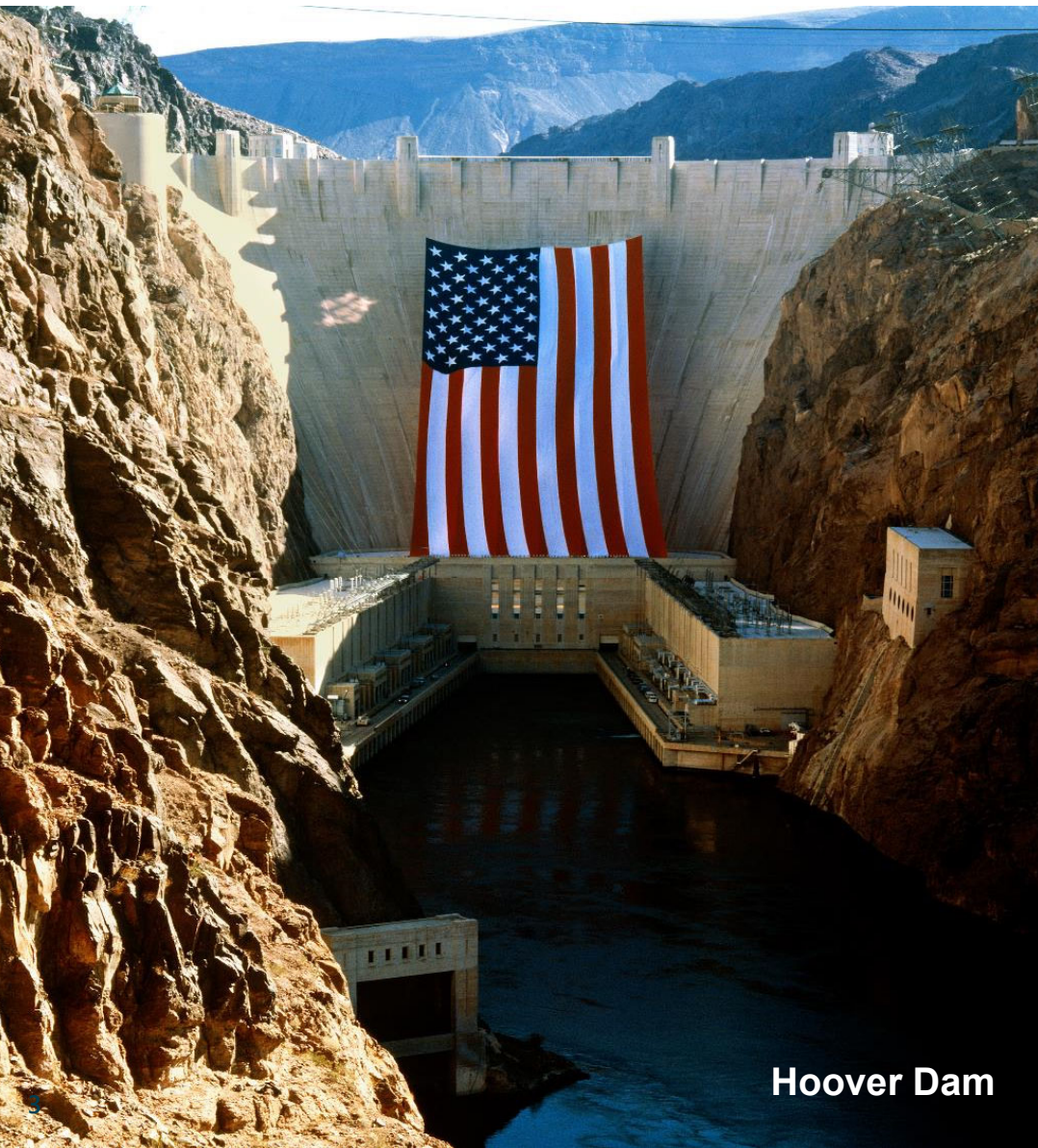


— BUREAU OF —  
RECLAMATION

# The Bureau of Reclamation's Transformative Maximo Journey







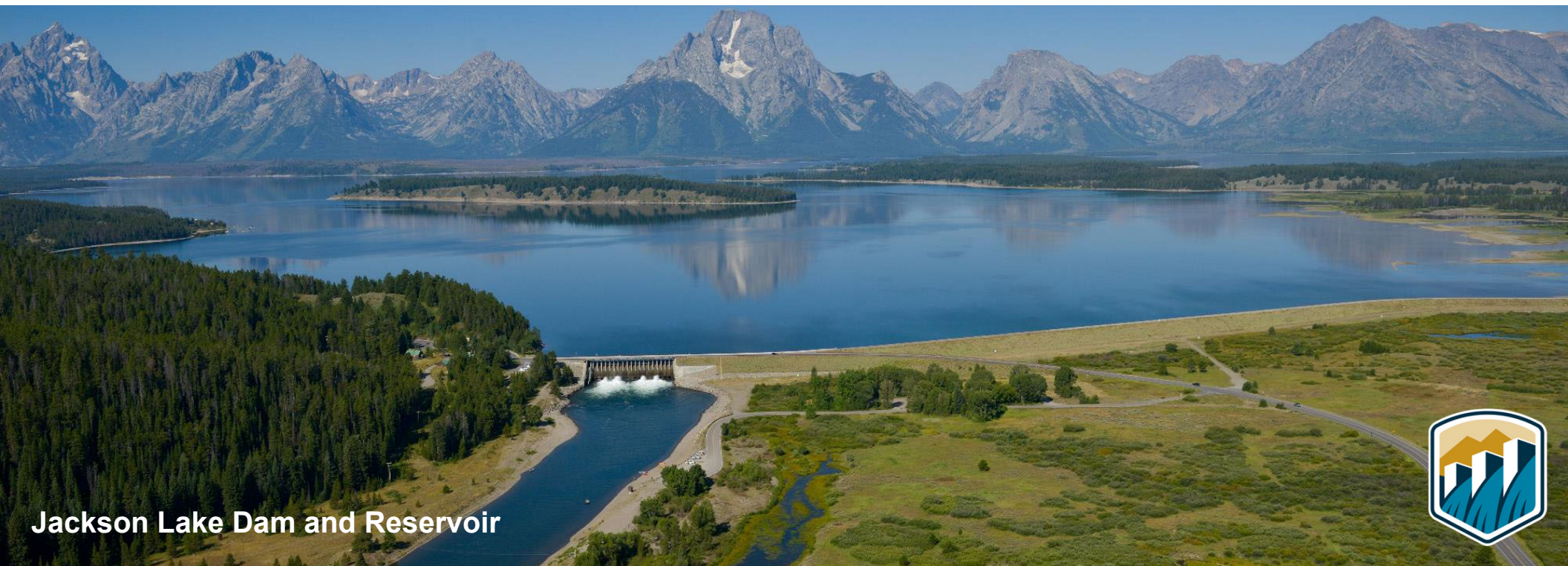
# Outline

- Reclamation Background
- History of Maximo at Reclamation
- Challenges and Advocating for Change
- CARMA 2.0 Project Overview
- Accomplishments (so far)
- Q&A





*The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.*

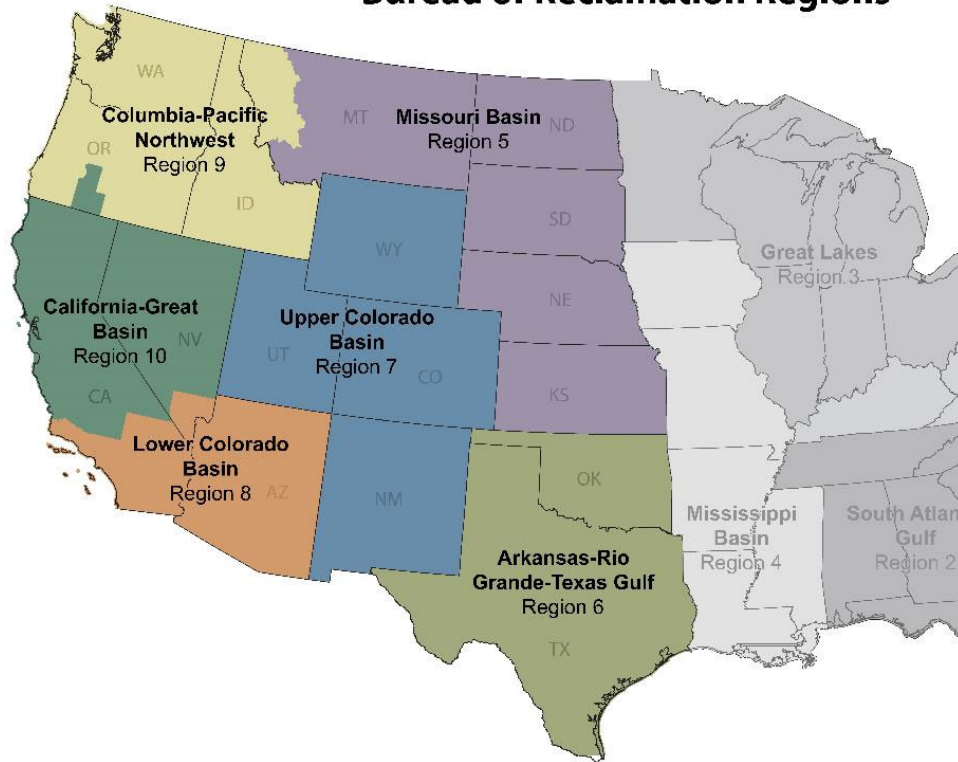


**Jackson Lake Dam and Reservoir**



# Organization

**Bureau of Reclamation Regions**



- Missouri Basin and Arkansas-Rio Grande-Texas Gulf
- Upper Colorado Basin
- Lower Colorado Basin
- Columbia-Pacific Northwest
- California-Great Basin





# Water Delivery

- Largest wholesaler of water in the United States, serving 31M people
- Provides irrigation water to 20% of U.S. Western farmers (10M acres)
- Reclamation Projects enable farmers to produce 60% of the nation's vegetables and 25% of the nation's fruit and nut crops



Grand Valley Project, Colorado



# Power Generation

- Second largest producer of hydroelectric power in the United States
- 53 powerplants provide more than 40 billion kilowatt hours and a \$1B in power revenues
- Electricity produced is enough to serve 3.5 million homes



Glen Canyon Dam Generators





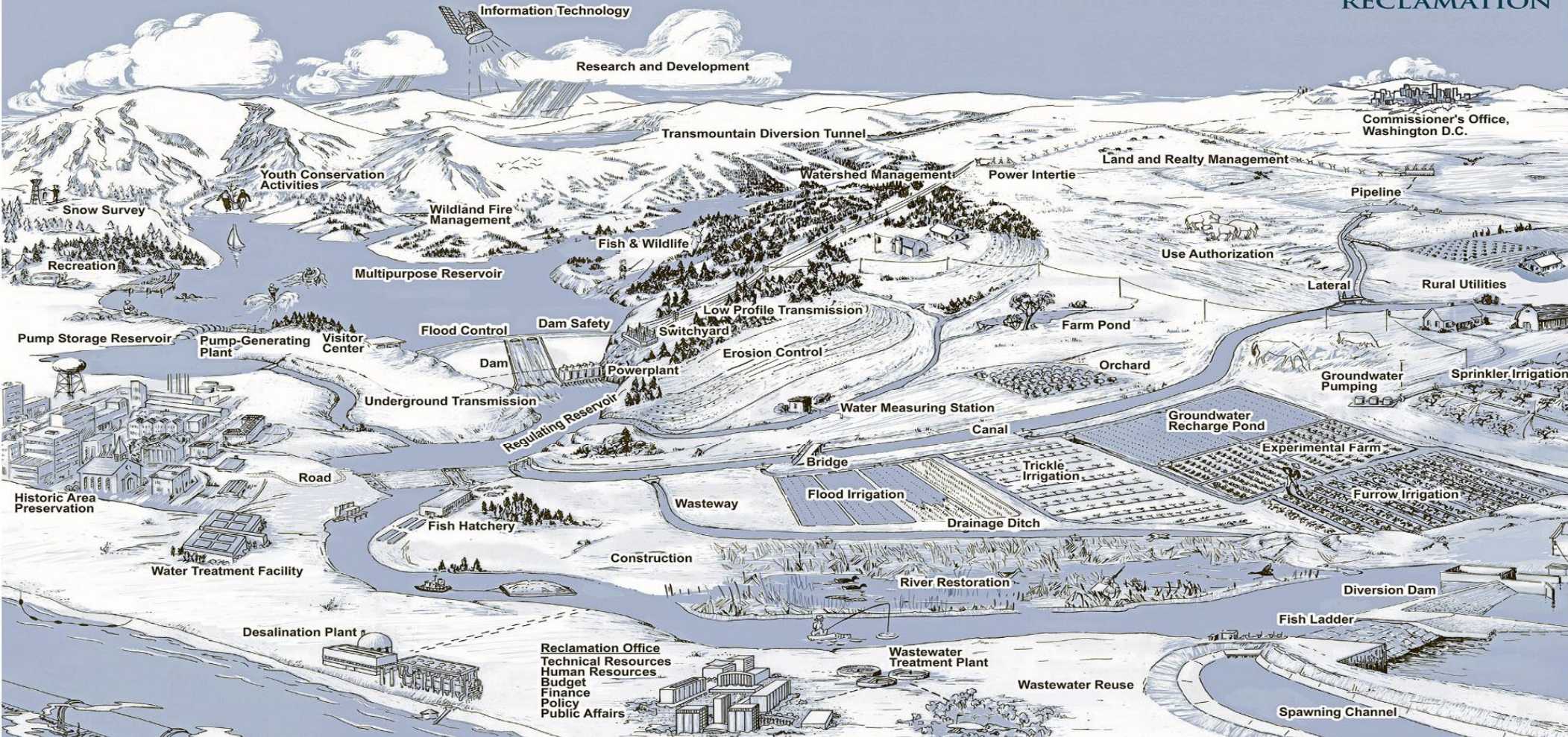
# Bureau of Reclamation Asset Management

The coordinated activity of an organization to realize value from assets.

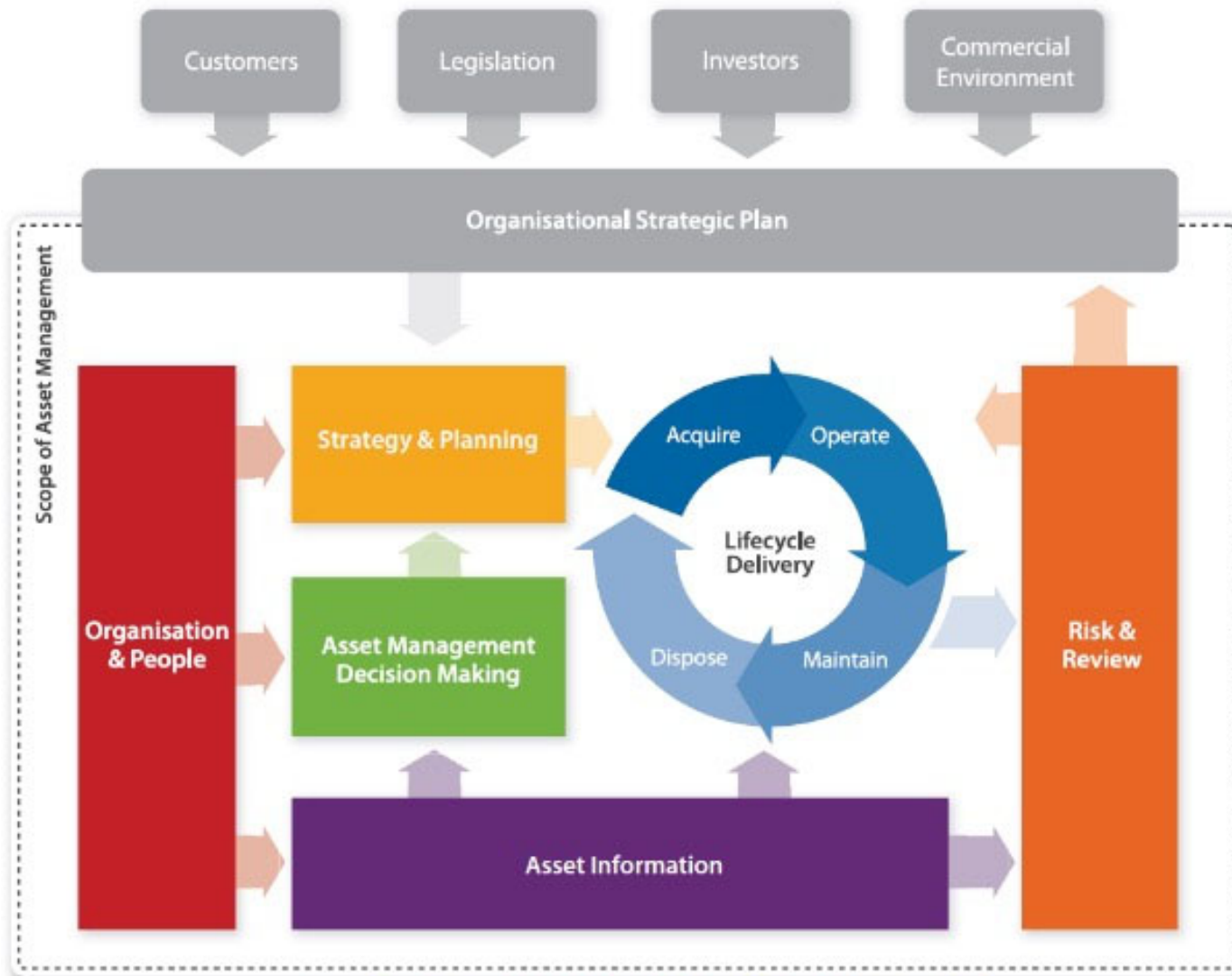
(International Organization for Standardization ISO 55000 Asset Management, (Clause 3.3.1))



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# Reclamation's Maximo History

**CARMA** (Capital Asset Resource Management Application) is Reclamation's implementation of IBM Maximo®'s core functionality.



**IBM Maximo®** is the world-leading maintenance management software solution with numerous applications and capabilities.

It is considered by many in the industry to be the **'best of breed'** option.



# Capital Asset & Resource Management Application (CARMA)

CARMA is Reclamation's customized deployment of:

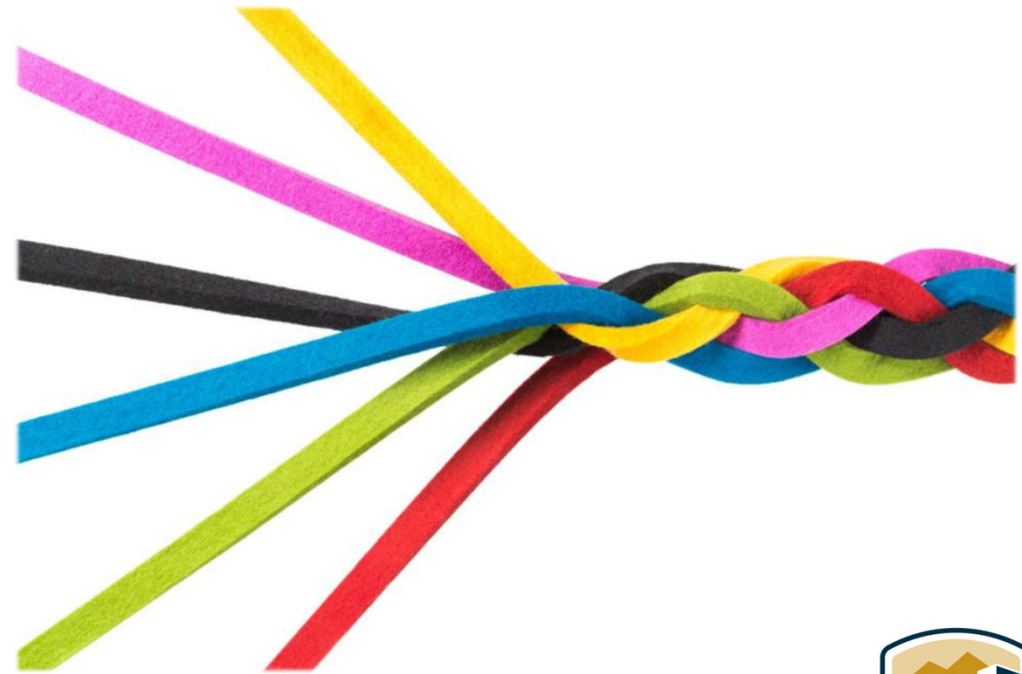
1. IBM® Maximo® Enterprise Asset Management software system;
2. DOI FBMS financial system built on SAP technology;
3. DOI Quicktime timekeeping application;
4. DataSplice – third-party inventory management tool for mobile devices (work orders and assets now available too);
5. CiM – third-party Planning and Scheduling tool; and
6. RulesManager – third-party business rules validation software.



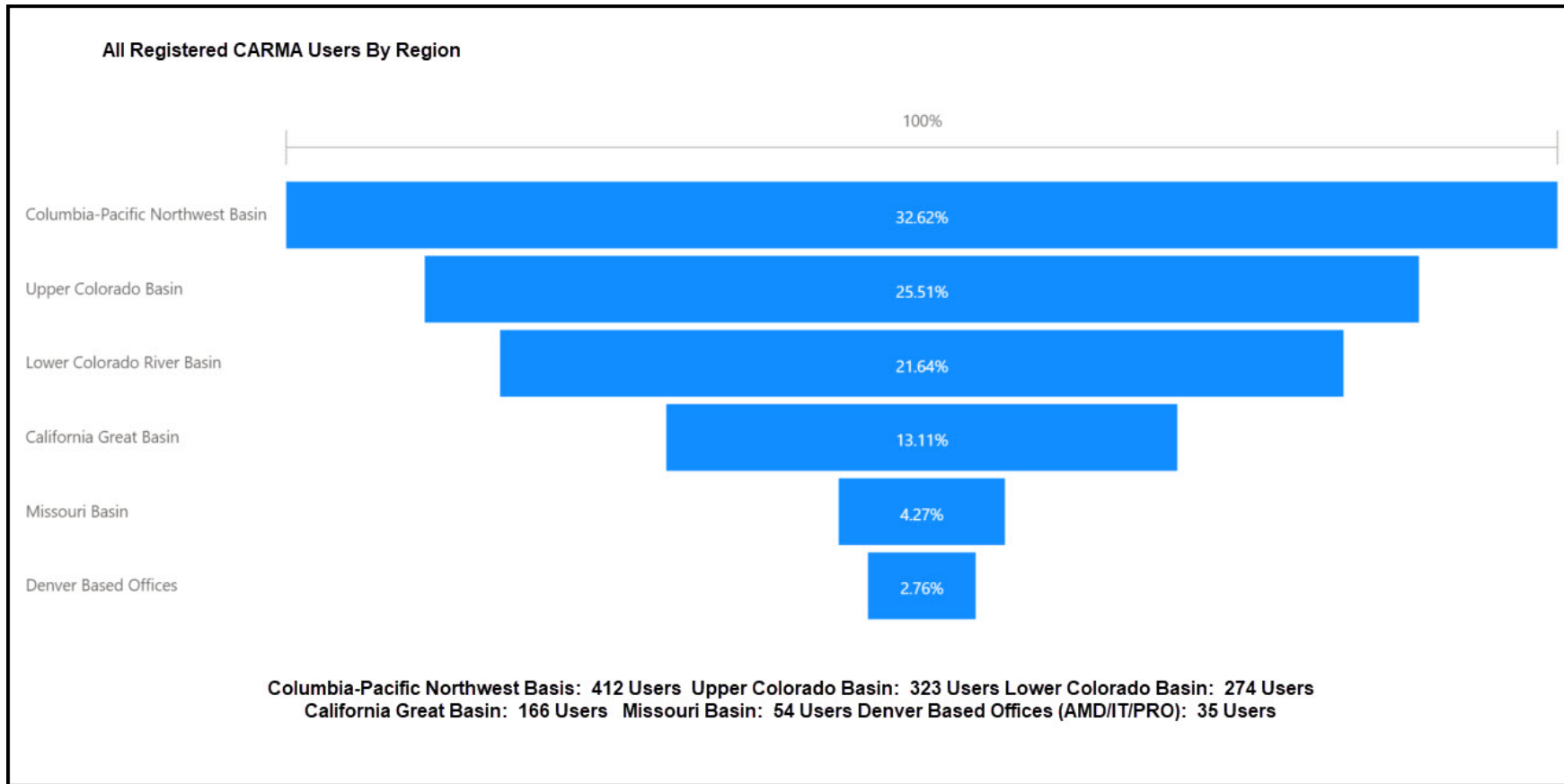


# 18 Instances Consolidated into 1 “Enterprise”

- Predicated on end of support for Maximo v4 in December 2005
- Departmental effort to transition Single Platform Maximo in Fiscal Year 2007
- Migration to single server to support CARMA 1.0
- Since 2008, has grown organically to 26 Maximo sites



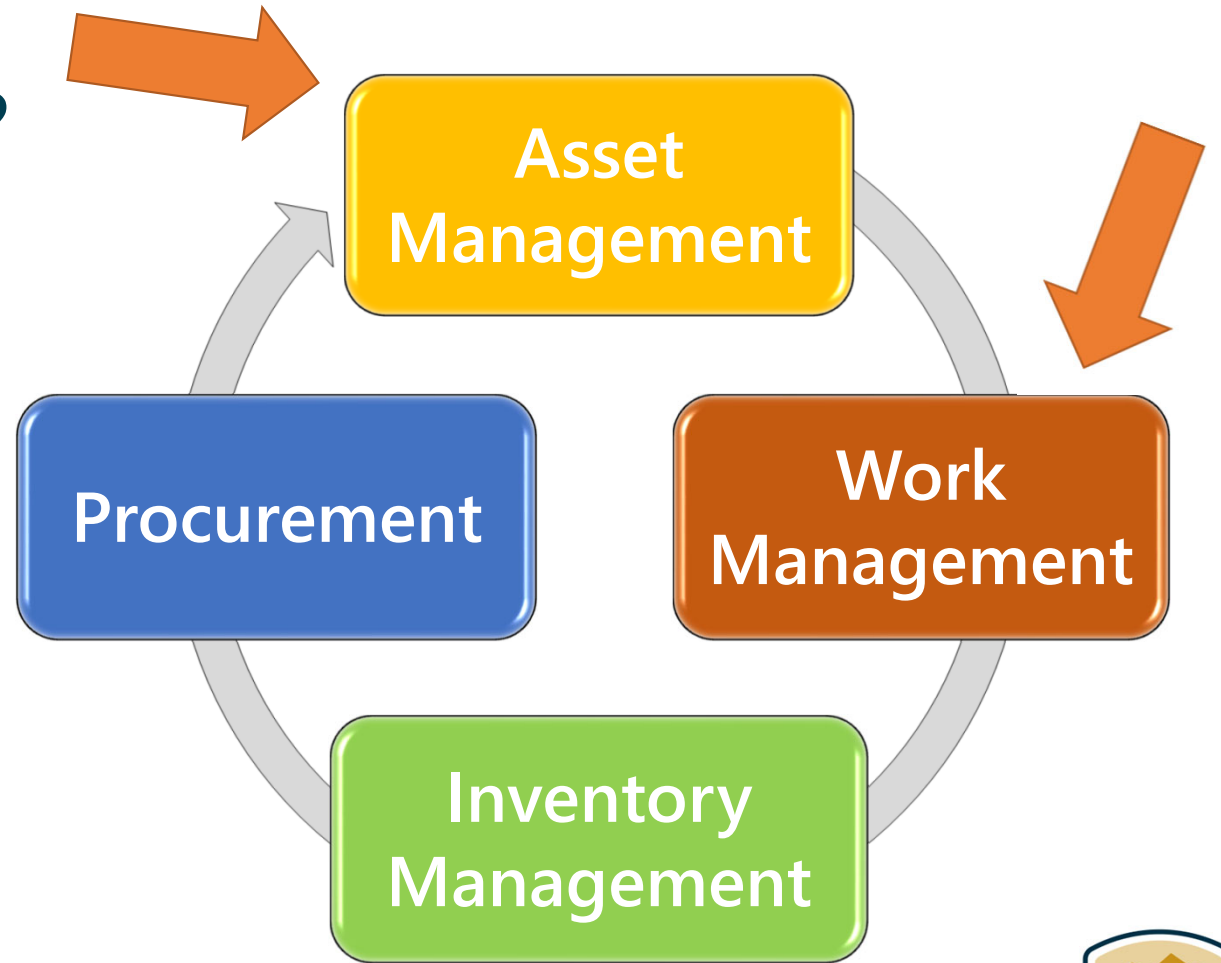
# CARMA Users by Region





# How do we use it?

1. Asset Management
2. Work Management
3. Inventory Management
4. Procurement (FBMS and CARMA)



## IBM Maximo Features Available

- **Locations, Assets**, Asset Templates, Asset Meter data, Asset Condition Monitoring, Asset Failure Codes, Inspections, Location & Asset Hierarchy for financial, failure, and usage data roll-ups; AI asset data collection
- Purchasing Requests, **Orders**, Request for Quotes, **Receiving**, Invoicing, **Vendor list**, financial approval process for purchasing
- Organization wide shared vendor contracts; Purchase (assets, spare parts, services), Lease/Rental, Labor, Asset Warranty
- Organization wide shared **Inventory (equipment spare parts** and repairable assets), Inside and Outside Services, Tools (calibrated, heavy equipment, charge-backs)
- **Maintenance planning** and scheduling, **Routes**, Safety Plans, Preventive & Predictive Maintenance, and **Work completion, Labor, Materials**, Services, and Tools tracking, Resource Management
- Service Desk ticketing for maintenance work, internal IT support (like Heat tickets), purchasing
- Mobile Device Usage – live and off-line
- Barcoding and QR coding
- Bi-directional interfacing with multiple other database driven systems; Financial, HR, Time Reporting, Asset meter data
- Robust Reporting – end user developed, standard by IBM, custom built
- Dashboards with KPIs, Reports, Asset statuses, etc.
- GIS Mapping interface for locations, work scheduling, etc.
- **Labor crafts**, crews, certifications/qualifications
- Business process workflow review and approval processes capable
- IBM Created add-ons: Health, Safety & Environment; Transportation; Utilities; Linear Assets; Spatial (GIS)

## CARMA Features Currently Being Used

- **Locations & Assets tracking**
- Double entry of **Purchase Orders between CARMA and financial system, Receiving, Vendor list**
- Some sites **Inventory (equipment spare parts)**
- **Maintenance Planning, Routes, Preventive Maintenance, Work Completion with Labor and some materials**
- Single direction **interface between financial system and between time reporting system**
- Some **reporting**, most still Excel data dumps
- **Labor crafts**





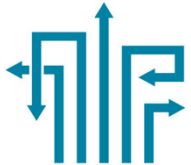
# Current Challenges



Lack of singular, approved enterprise vision for future CARMA use



Inconsistent enterprise data, data organization, and enterprise CARMA business processes



Decentralized and competing needs



Independent and duplicative data silos



Resourcing, support, communication, and training issues



# CARMA Strategic Plan

- Fall 2020 Reclamation Leadership Team Meeting Action Item – Develop plan to improve CARMA data
- Cross directorate team developed scope of work for a Strategic Plan for the future of CARMA
- Contractor hired to facilitate Strategic Plan development
  - Conducted in four phases
    - Phase 1: Document Current use and Assess Internal Reclamation Feedback
    - Phase 2: Peer Benchmarking
    - Phase 3: Improvement Alternatives
    - Phase 4: Develop Strategic Plan and Recommendation for Selected Alternative



# Phase 1 (Current CARMA Usage)

- Reviewed existing CARMA documentation and business practices
- Over 100 employees (field to HQ) offered interviews (69 accepted)

## Findings from interviews:

- CARMA business objectives and IT management practices are not organized for optimal value
- Desire for additional Maximo features
- Lack of technical support and training
- Absence of leadership engagement/championship





# Phase 2 – Peer Benchmarking

- Ten Utilities participated in a survey and interviews
- Findings from Benchmarking:
  - **Reclamation's challenges are not unique**
  - Reclamation uses less of IBM Maximo's capabilities than most peers
  - Reclamation invests much less in its system than all peers interviewed

ONTARIO POWER  
GENERATION

Manitoba  
Hydro

NEW YORK  
STATE OF  
OPPORTUNITY  
NY Power  
Authority

US Army Corps  
of Engineers®

SRP  
SALT RIVER PROJECT

CHELAN COUNTY  
P.U.D.

TVA

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DUKE  
ENERGY®

Southern  
Company



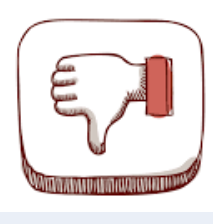



# Phase 2 – Peer Benchmarking

Maximo Add-on Usage									
	HSSE	Transportation	Utilities	Linear	Spatial	Mobile	Gaant Scheduling	Work Centers/ Inspections	KPIs & Dashboards
RECLAMATION	N	N	N	N	N	N	N	N	N
	Y	N	Y	N	Y	Y	Y	N	Y
	N	N	Y	N	N	Y	Y	Y	Y
	Y	N	N	N	Y	Y	Y	N	Y
	N	Y	N	N	Y	Y	Y	N	Y
	Y	Y	N	N	N	Y	Y	Y	Y
	N	Y	N	N	N	Y	Y	N	N
	N	N	N	N	N	Y	Y	N	N
	Y	N	Y	Y	Y	Y	Y	N	N

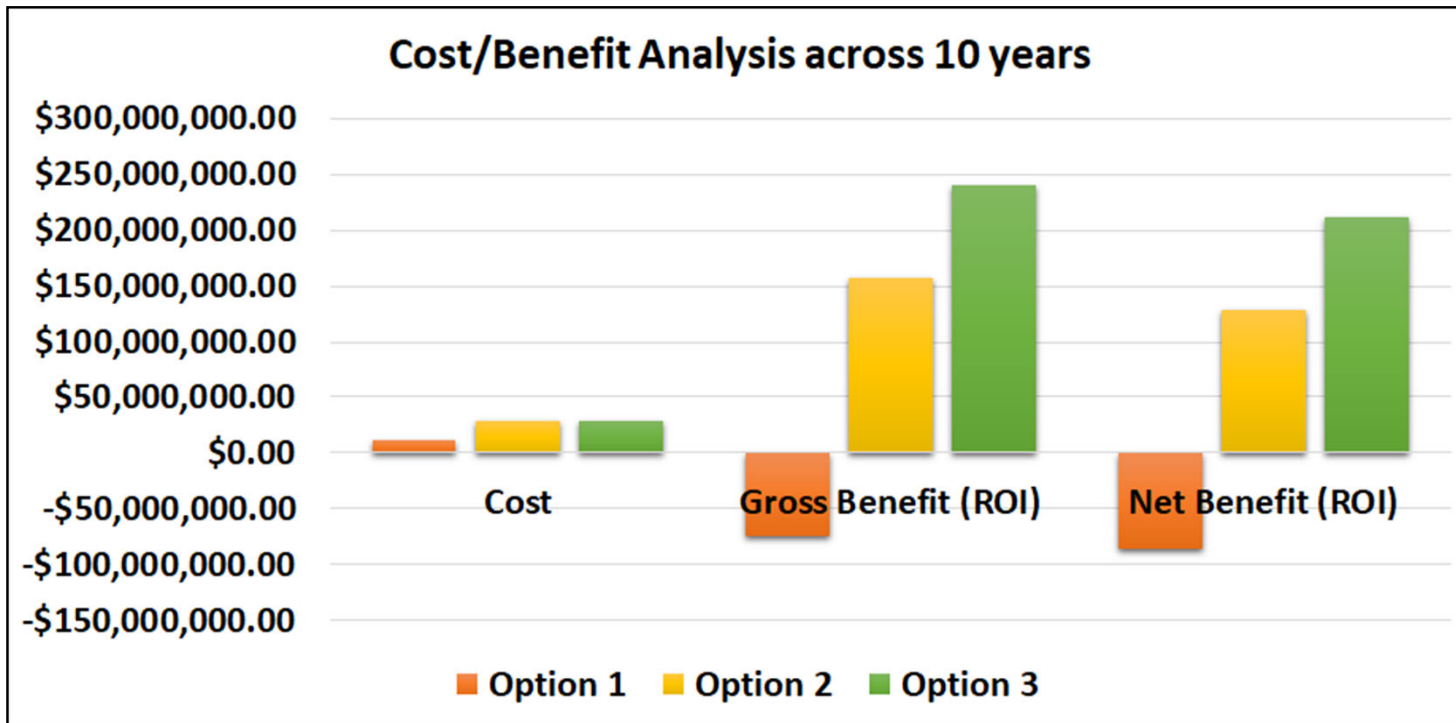


# Phase 3 – Proposed Alternatives

	Option 1: Status Quo	Option 2: Patch Things	Option 3: Improve with CARMA 2.0
<p><b>Advantages</b></p> 	<p>Minimal disruption to users</p>	<p>Remedies some current issues and limitations</p> <p>Provides some of what current users need</p>	<p>Potential to remedy <b>ALL</b> current issues and limitations</p> <p>Manageable with offline disruption – all changes implemented at one time</p> <p>Potential to meet <b>ALL</b> current business needs</p>
<p><b>Disadvantages</b></p> 	<p>Continues current issues and limitations</p> <p>Does not provide what current users need</p>	<p>Significant and ongoing disruption to users</p> <p>Does <b>NOT</b> meet all current business needs</p>	<p>Significant organizational change for users, but it is a 1-time event.</p> 



# Cost vs Benefit of Proposed Options



	Option 1	Option 2	Option 3
Cost	\$11 M	\$29 M	\$29 M
Gross Benefit (ROI)	-\$75 M	\$157 M	\$241 M
Net Benefit (ROI)	-\$86 M	\$128 M	\$212 M



## Option 3 Recommended: Reimplement CARMA 2.0 (Maximo Application Suite 9.x) in Reclamation Cloud (Microsoft Azure)

- Less effort for field staff (mobile solutions, common maintenance)
- Better data for improved risk informed decision making
- Ability to perform trending analyses on equipment
- Visibility on condition and total cost of ownership of all assets across Reclamation
- Lower long-term costs for Reclamation (more efficiencies)
- Less work for developers and trainers
- Absorb several aging IT applications (DSIS/PRIS, Mechanical Database, etc.)
- Cost savings of ~\$200M over 10 years



# CARMA 2.0 Strategy

- Less effort for use
- Better data
- Visibility of assets
- Lower long-term costs
- Improved Asset Management Maturity Level
- Enter once, use everywhere





# CARMA 2.0 Project Schedule

Project Kickoff  
02/07/2024 -  
**COMPLETE**

90 Day Pilot complete  
Phase 2 Workshops  
begin

Phase 1 complete, Phase  
2 Pilot complete, Phase 3  
begins

Phase 2 complete  
Phase 3 Pilot  
complete

Project Complete  
Approximately  
1/31/2028

12 months

24 months

36 months

48 months

CARMA 2.0 Phase 1 - Foundations

CARMA 2.0 Phase 2 - Enterprise

CARMA 2.0 Phase 3 - Optimization

CARMA 2.0 Project



## Trusted Experience

- 25+ Years Maximo Experience
- Elite Maximo Skills – Avg Consultant Exp 12+ years
- More than 3,000 successful Maximo implementations and integrations projects

## Integrated Solution Provider

- Experienced at providing all aspects of the Maximo solution – Software, Hosting, Consulting

## Value Add Offerings – Improved Time to Value

- Advanced Asset Management (AAM), RulesManager Studio/MaxAssist, OMNI, RulesManager for Maximo Mobile

Welcome, Mike Wilson

Administration Report Admin

Quick Insert

New Person

New User

Security, Users and Groups

Users

Security Groups

People

Person Groups

Workflow Configuration

Workflow Designer

Validation Templates

Administration

Person Groups

Person Groups

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PM vs CM Work - All Work Orders (%)

Last Run: 6/1/2014 3:30 PM

PM Performance (%)

Status: KPI

Actual: 75

Target: 95

Variance: -20.27

PM Performance (%)

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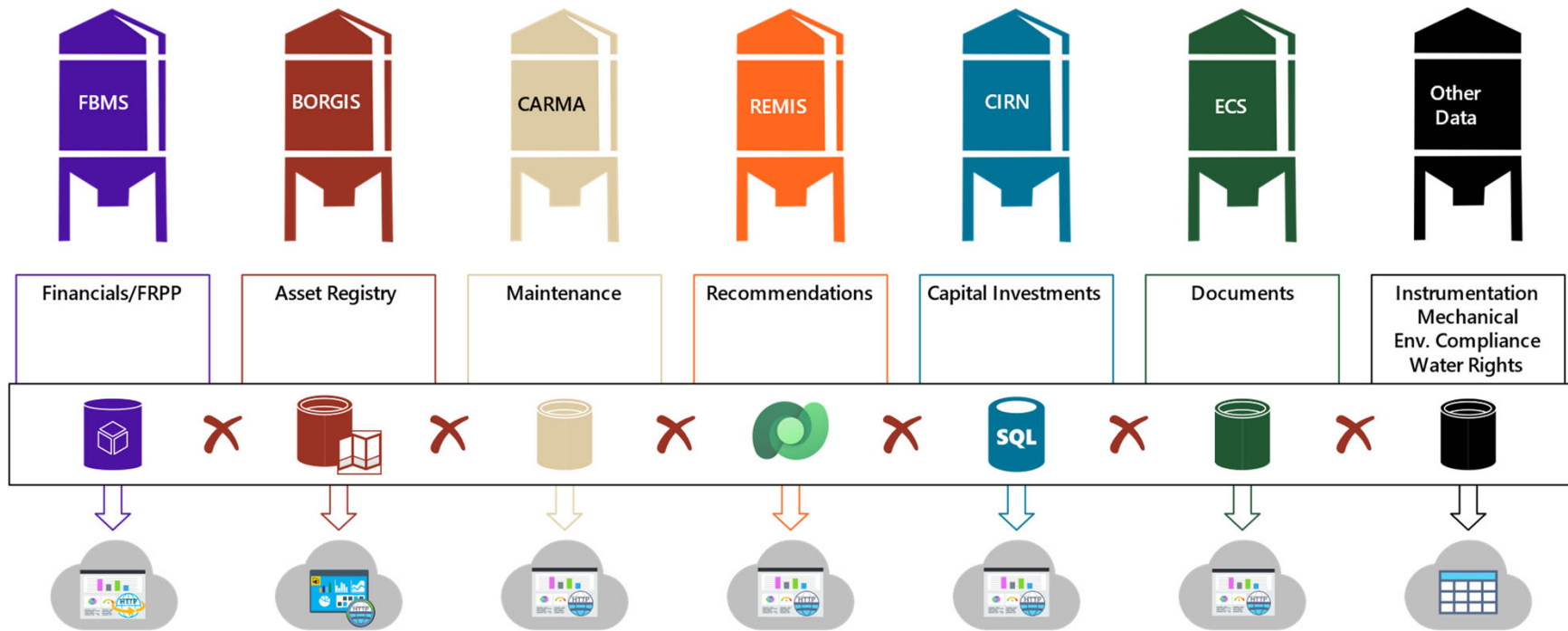
# Phase 1: Foundation Goals

- MAS 9 in the Reclamation Cloud
- Standardize data architecture and business processes across all regions and facilities
- Data quality improvements
- Explore GIS and other data integration capabilities
- Robust reporting and dashboards for summary data
- Improve integrations and processes with adjacent systems (financial, time and attendance, acquisitions)

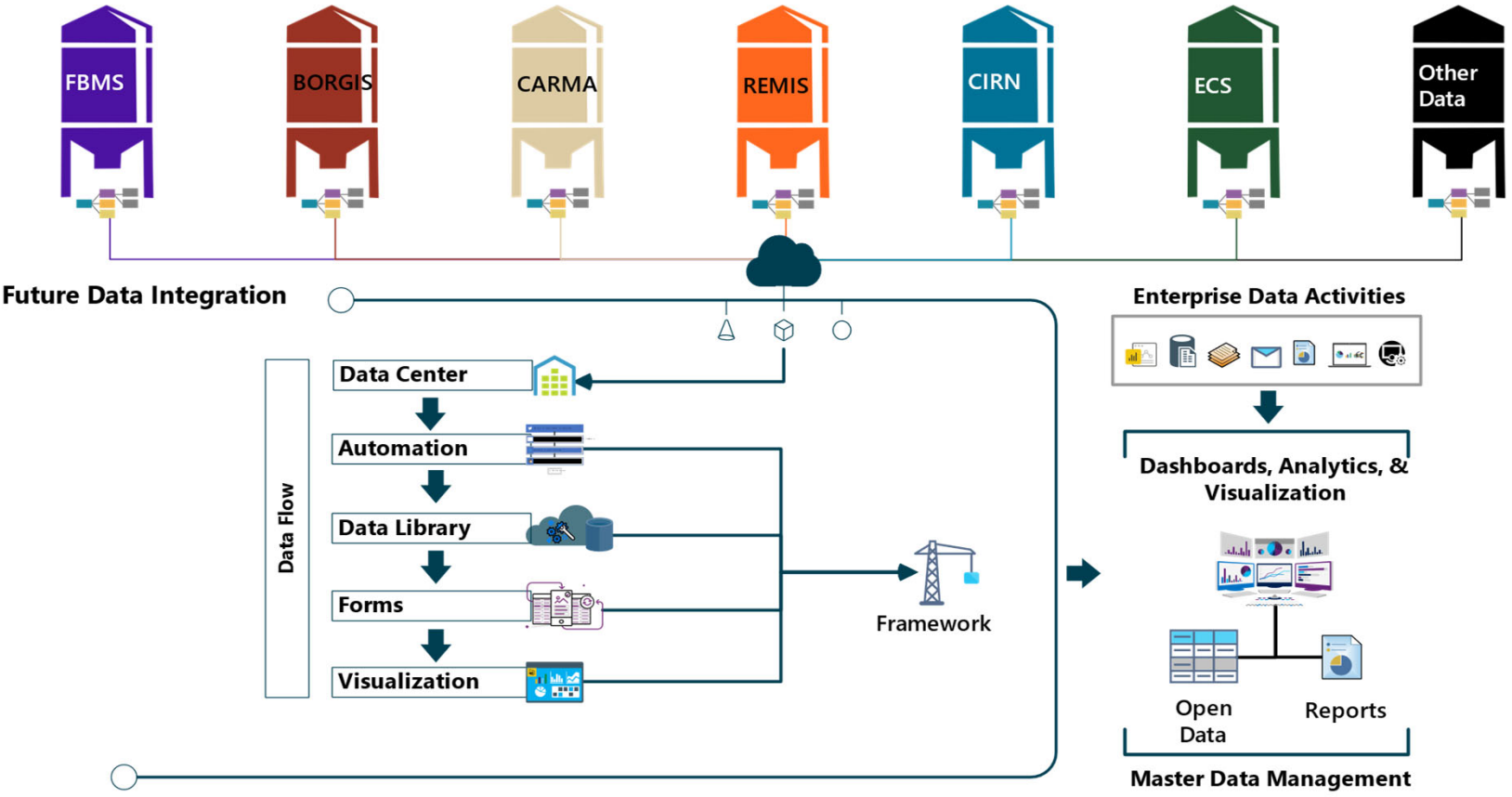




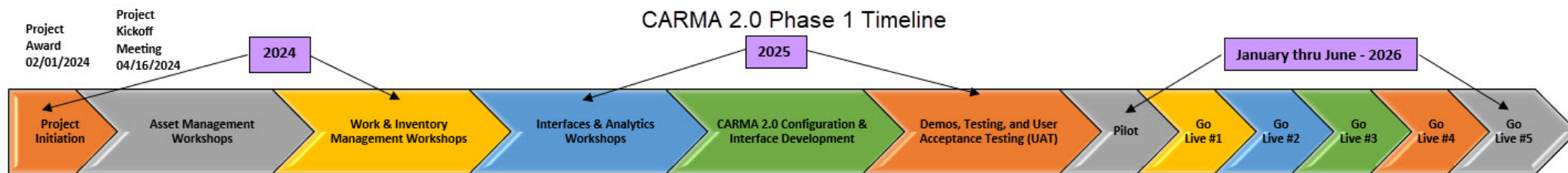
# Evaluating Enterprise Data Integration



# Where would we like to be?



# CARMA 2.0 Phase 1 Timeline and Challenges



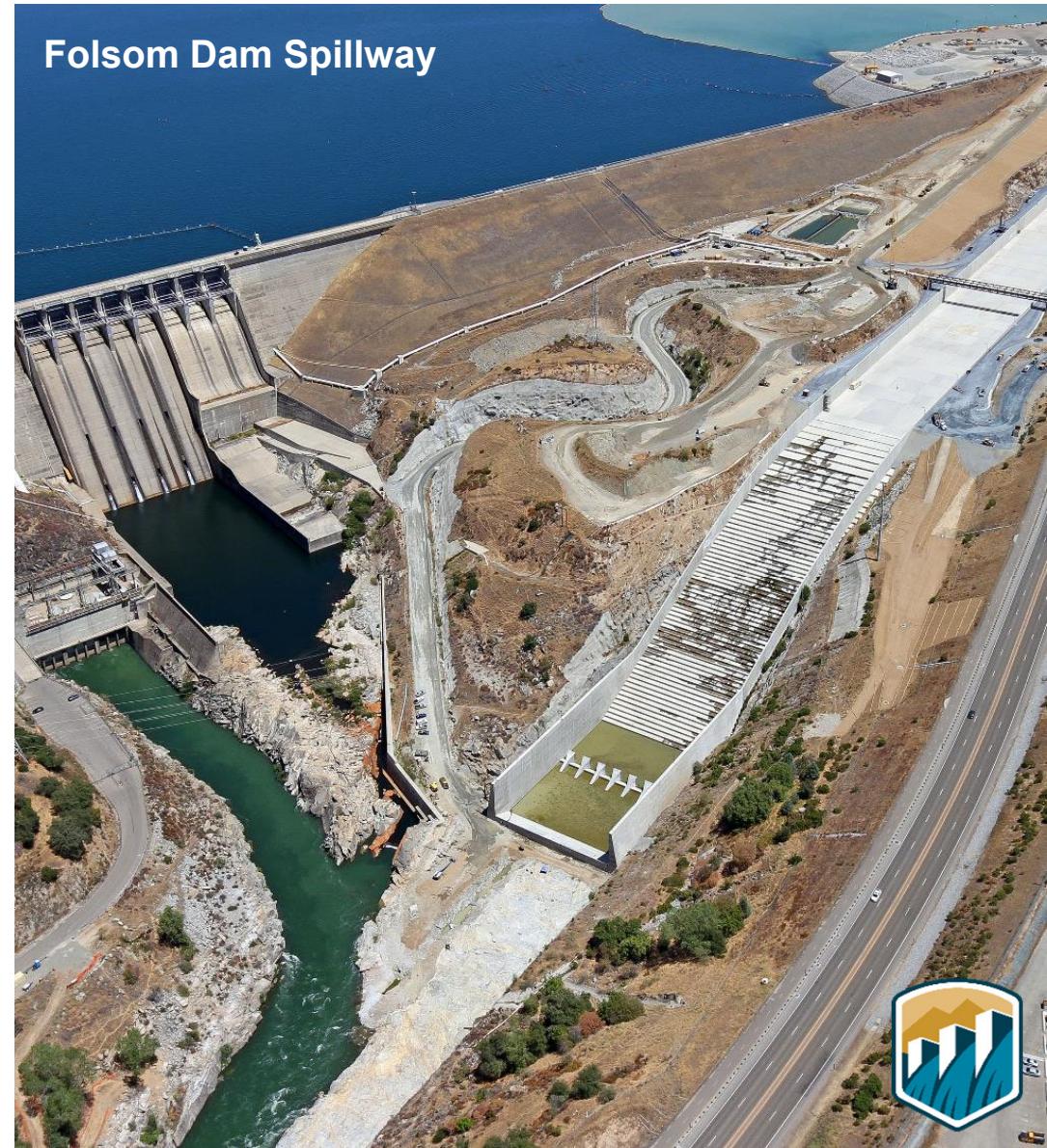
- Still working to stand up demo environment; have hit some snags along the way
- Several Phase 1 workshops remaining; working with TRM and Project core team to address/approve recommendations and action items
- Time and resources are precious.





# What have we accomplished (so far)?

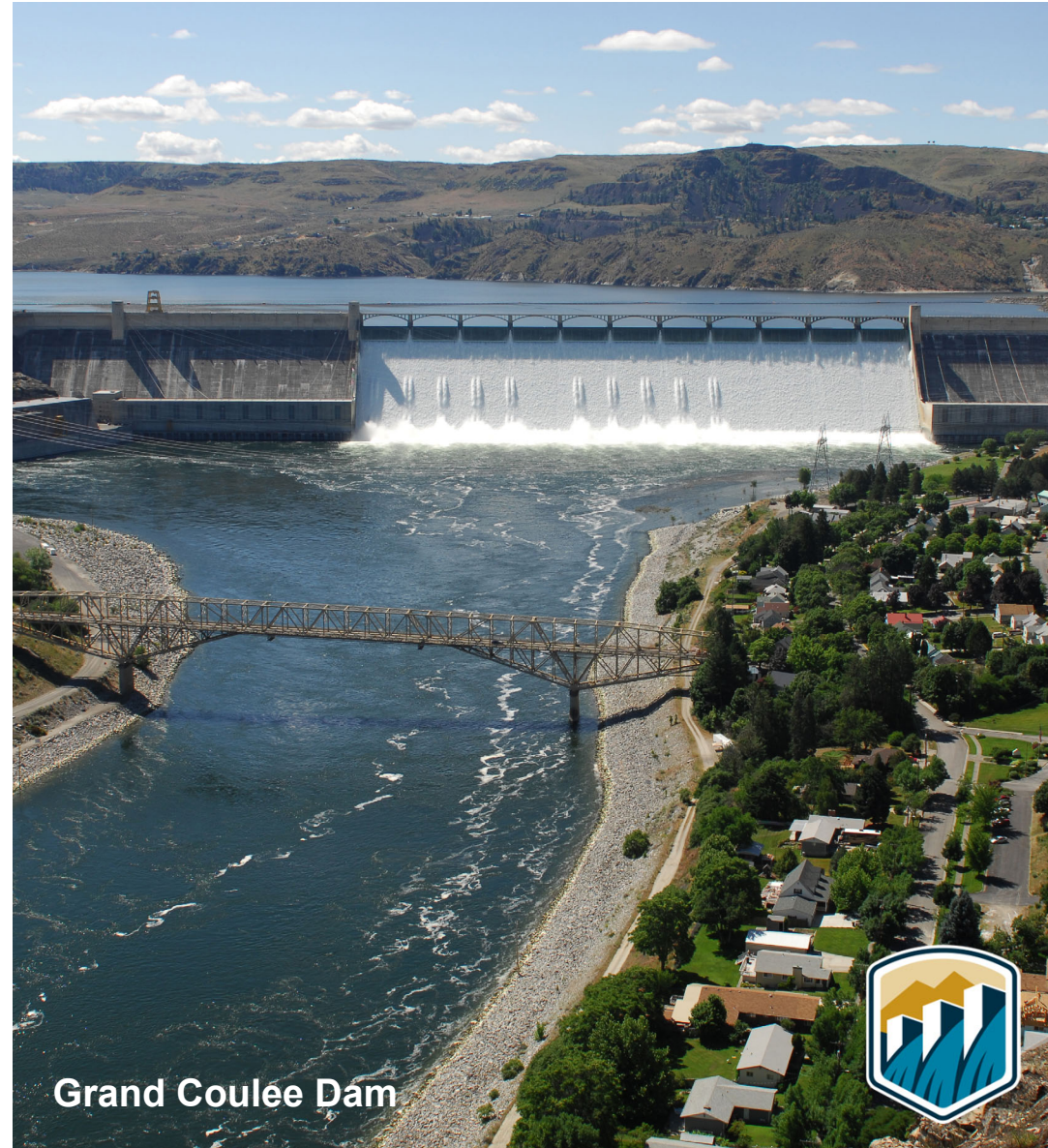
- Completed 14 workshops/requirements gathering sessions, engaging with a variety of SMEs across the organization
- Approved standardized Location and Asset hierarchies for Reclamation's critical infrastructure and asset types
- Business process standardization (priority/criticality, failure hierarchy, inventory/purchasing workflows, etc.)
- Agreement on key asset data required to effectively manage, track, and report on our assets
- Continued stakeholder engagement and OCM planning to ensure project visibility, engagement, and understanding





# Phase 2: Enterprise Goals

1. Builds upon the Phase 1 re-implementation data governance and architecture and emphasizes scaling across Reclamation
2. Demonstrate new capabilities that Reclamation personnel can use to support manual and paper-based processes:
  - a) Condition Assessments, Reviews, Inspections – electronic-based forms
  - b) Integrations (passing data back and forth) with Asset Registry (GIS), DSIS, PRIS, CIRN, etc. – limit double and triple entry of the same information into multiple places



Grand Coulee Dam

# Phase 2 Outcomes & Events

- **New Users in CARMA**
  - Dam Safety
  - Water O&M
  - Recreation/Lands
  - Regional offices
  - Area offices
  - Field offices
- **Data Integration**
  - Asset Registry (ArcGIS)
  - PRIS/DSIS (Recommendations)
  - CIRN (Investment Needs)
  - HydroAMP (Hydropower Condition)
  - POMTS (Power Operations Data)
- **Additional IBM Maximo Features**
  - Electronic inspection forms
  - Meter, Condition Monitoring, and Condition Assessment (Inspection) based Preventive Maintenance
- **Scoping Workshops for Phase 3**
  - Power BI Dashboards & Reporting
  - SCADA data tracking and Historian integration with CARMA
  - IBM Monitor, Prediction, and Health, Safety, and Environmental add-on applications







Why do we think we'll be successful?

## Our People

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- ✓ Buy-in
- ✓ Unified Vision
- ✓ Dedicated Teams and Staff
- ✓ Strong Partnerships
- ✓ The Will to Be Better





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