Introduction to the speaker

- Working in state government since 2004
- Started with MnDOT Bridge Office in 2009
  - NSTM Inspections
  - NBIS Compliance
  - Inventory Management
  - Asset Management
- Bachelor's in Civil Engineering, Master's in Software Engineering
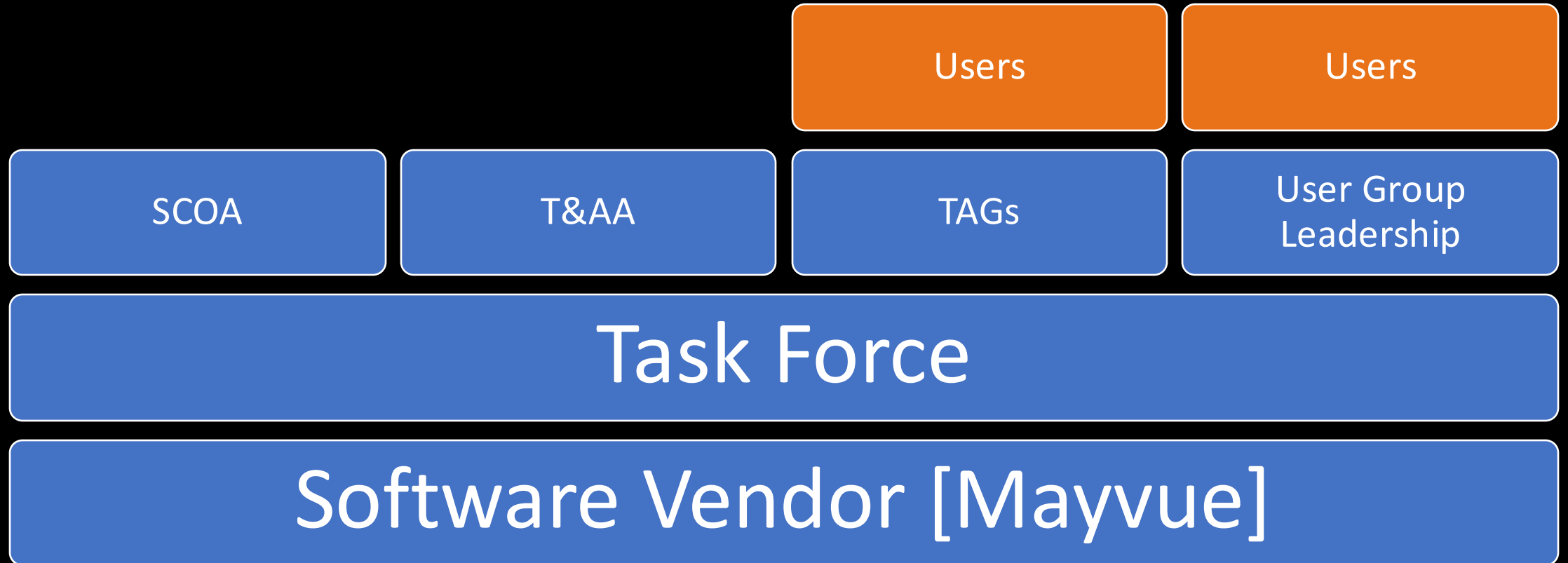- BrM Task Force since 2019, "Chair" since 2023
- 3 kids, 1 dog and 1 wife

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Who is the Bridge Management Task Force

- Minnesota
- Nebraska
- Rhode Island
- Michigan
- South Carolina
- California
- Kentucky

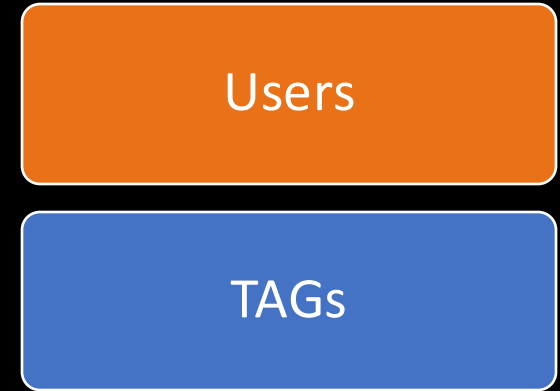# Collaborative Software Development

Users	Users

SCOA	T&AA	TAGs	User Group Leadership

Task Force

Software Vendor [Mayvue]

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Technical Advisory Groups (TAGs)

- Testing - Jacob Armour
- Database - Craig Nazareth
- Optimizer - Ryan Cram
- Reports/Dashboard - Emily Bickley

Users

TAGs

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Technical Advisory Groups (TAGs)

- **Testing - Jacob Armour**   Test new versions of BrM
- *Database - Craig Nazareth*   Prioritize enhancements
- *Optimizer - Ryan Cram*   Explore dusty corners of BrM
- *Reports/Dashboard - Emily Bickley*

Technical Advisory Groups (TAGs)

- *Testing - Jacob Armour*   Provide feedback on database design

- Database - Craig Nazareth   View early versions of ERDs

- *Optimizer - Ryan Cram*   Advanced topics on how to leverage DB

- *Reports/Dashboard - Emily Bickley*

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Technical Advisory Groups (TAGs)

- *Testing - Jacob Armour*
- *Database - Craig Nazareth*
- Optimizer - Ryan Cram
- *Reports/Dashboard - Emily Bickley*

Lobbying for Optimizer enhancements

Adopting latest research into software

Identifying best practices from States

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Technical Advisory Groups (TAGs)

- *Testing - Jacob Armour*
- *Database - Craig Nazareth*
- *Optimizer - Ryan Cram*
- Reports/Dashboard - Emily Bickley

Understand needs from users

Explore emerging technologies

Advocate for COTs implementation

Technical Advisory Groups (TAGs)

- Testing - Jacob Armour
- Database - Craig Nazareth
- Optimizer - Ryan Cram
- Reports/Dashboard - Emily Bickley

Grow BrM proficiency

Connect with experts across the nation

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User Group Leadership

- ## President: *vacant*
  - ### Formerly Ryan Cram, Kentucky DOT

- ## Vice President (Modeling): *vacant*
  - ### Formerly Jacob Armour, Michigan DOT

- ## Vice President (Structure Inspection): *vacant*
  - ### Formerly Emily Bickley, South Carolina DOT

- ## Vice President (Project Management): Corey Cowden, Caltrans

- ## Secretary: *vacant*
  - ### Formerly Patty Fish, Idaho DOT

Users

User Group Leadership

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User Group Conclave

- Avenue for input from users based on results of BrMUG

- Vote on enhancement ideas or product direction

- Voting has been resumed for this year, hasn't been done since 2019

- Weighted results will be included into future releases
  - Enhancement Champion
  - Budget
  - Competing priorities
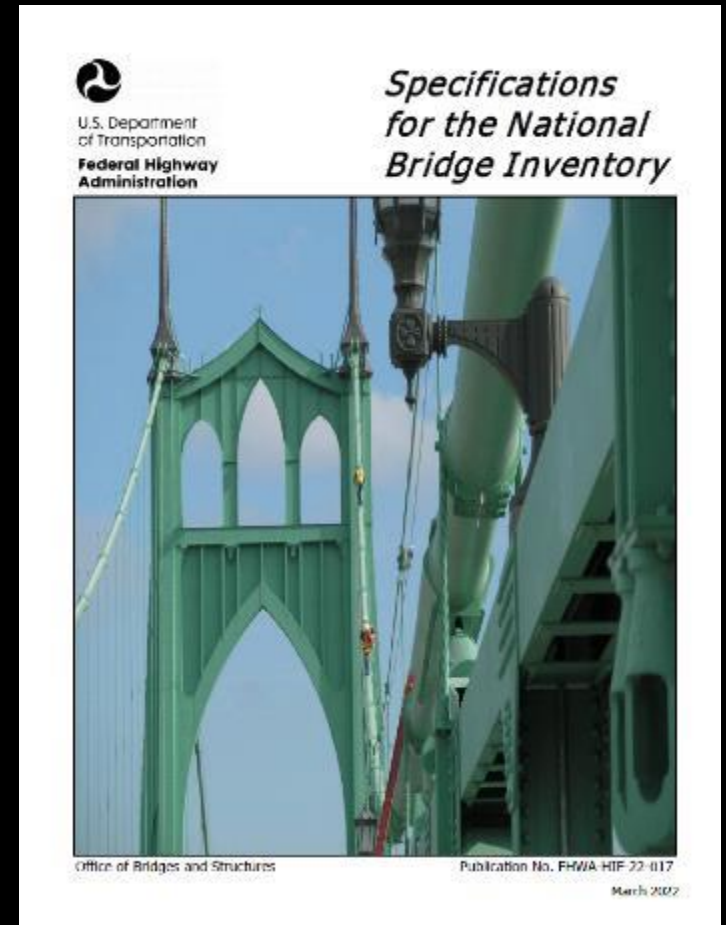
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Task Force Panel Discussion

- Ask open ended questions to Task Force Members

- Goal is to provide transparency & emphasize collaboration

- Hasn't been done in more than 10 years
  - Be nice


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In 2022, the FHWA

- Overhauled the Recording and Coding Guide for the National Bridge Inventory

- Made major revisions to the National Bridge Inspection Standards

- Major changes for the entire industry

- Set March 2026 to start submitting in new format

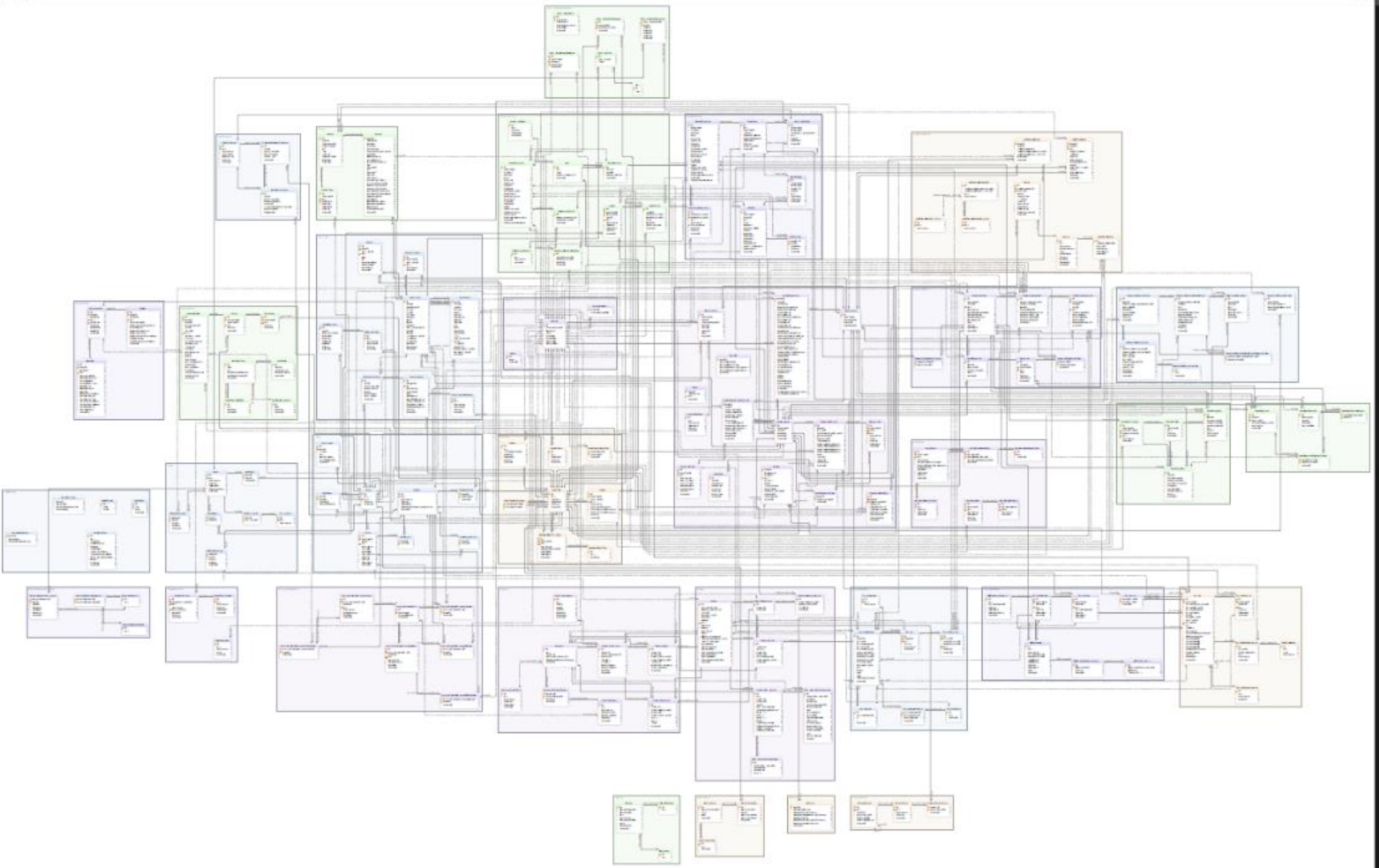- Set March 2028 for full compliance

U.S. Department of Transportation
Federal Highway Administration

Specifications for the National Bridge Inventory

Office of Bridges and Structures

Publication No. FHWA-HIF-22-017

March 2022

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Where we've been –
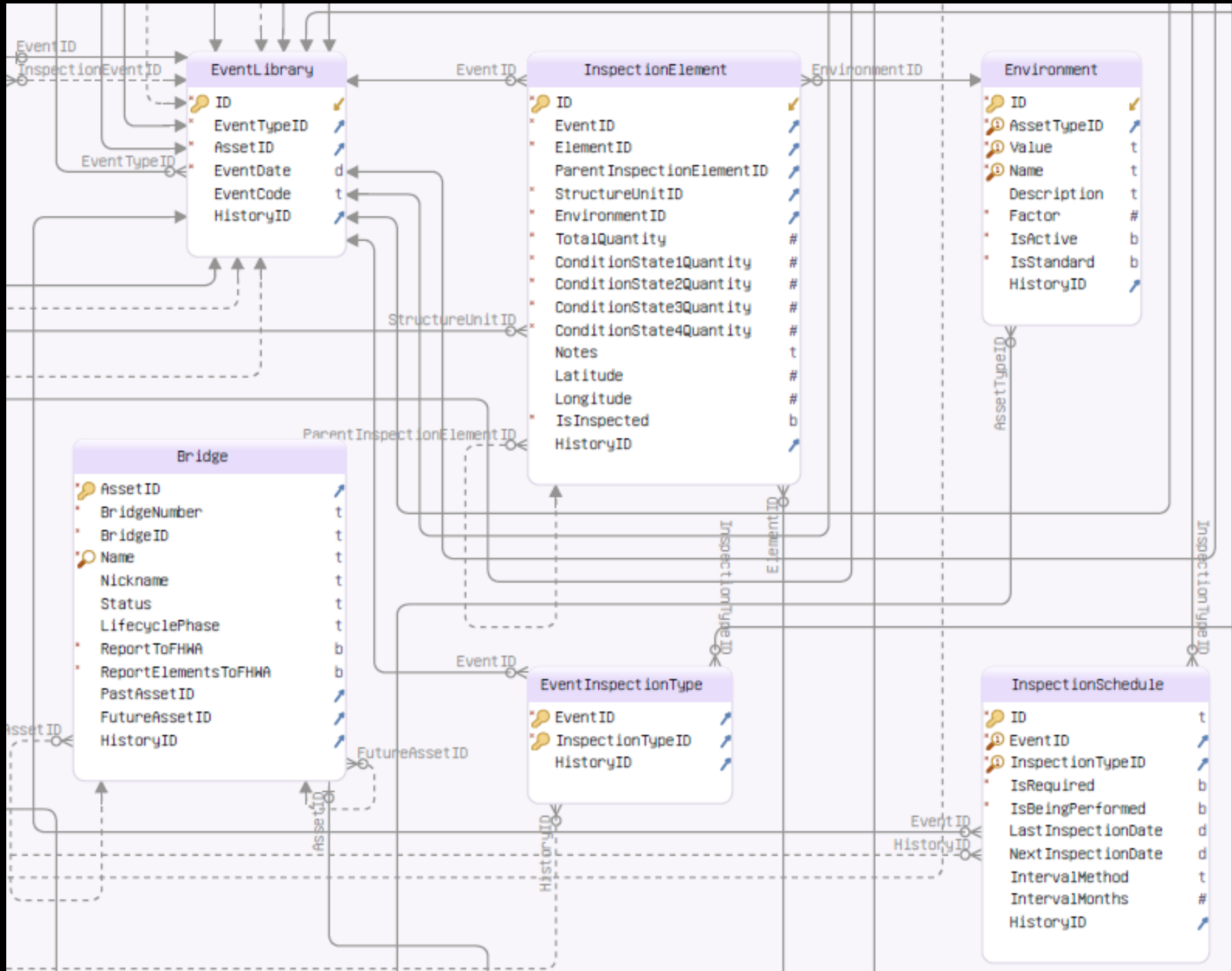# SNBI Collector: Powered by Mayvue (June 2023)

- SNBI-compatible version of mobile collector.

- No App Store required

- Device agnostic

- Seamless transition of the data into BrM 7.0

- Add-on to the enterprise version of BrM.

- 8 states currently license

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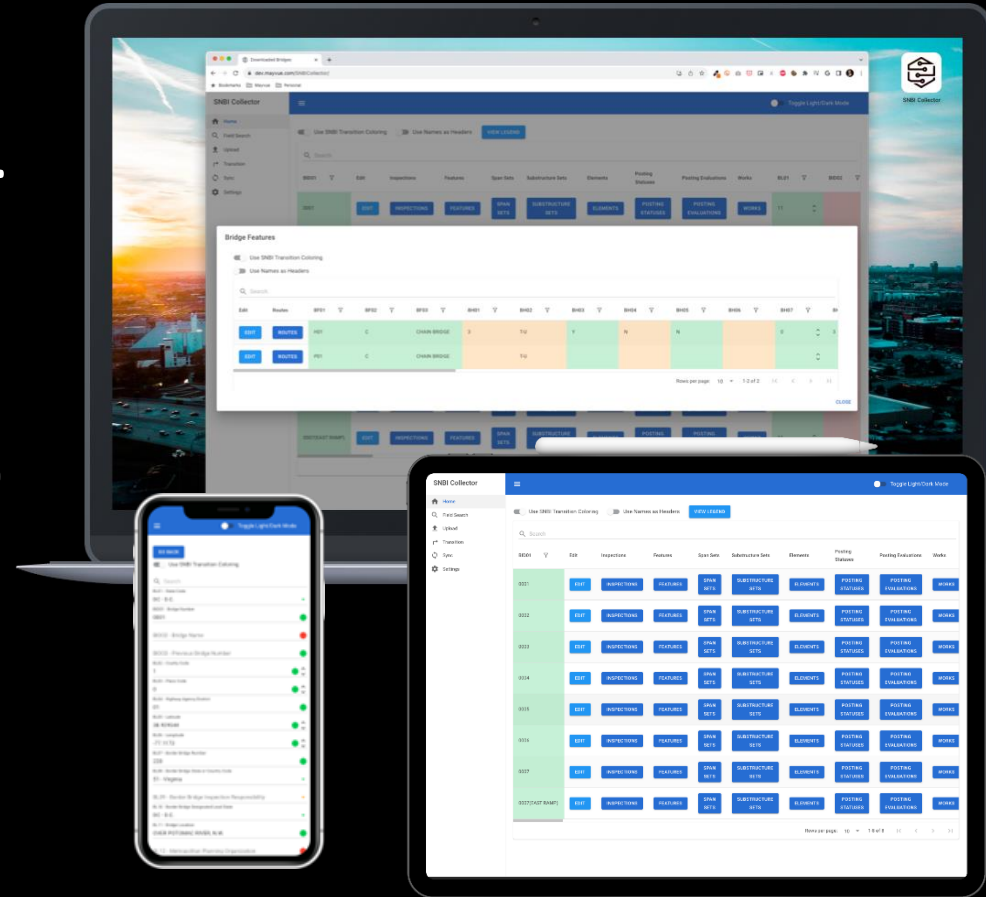
Where we're going – The Next Generation of BrM: 7.0

- Fully SNBI compliant
- Database and Application Overhaul
- Sustainability
  - Clear out old tech and bring in new
- Visual Forms Editor Overhaul (now called Page Builder)
  - Enhances configurability
  - Built in mind to improve the user experience

EventLibrary
- 🔑 ID ✓
- EventTypeID ↗
- AssetID ↗
- EventDate d
- EventCode t
- HistoryID ↗

InspectionElement
- 🔑 ID ✓
- EventID ↗
- ElementID ↗
- ParentInspectionElementID ↗
- StructureUnitID ↗
- EnvironmentID ↗
- TotalQuantity #
- ConditionState1Quantity #
- ConditionState2Quantity #
- ConditionState3Quantity #
- ConditionState4Quantity #
- Notes t
- Latitude #
- Longitude #
- IsInspected b
- HistoryID ↗

Environment
- 🔑 ID ✓
- 🔑 AssetTypeID ↗
- 🔑 Value t
- 🔑 Name t
- Description t
- Factor #
- IsActive b
- IsStandard b
- HistoryID ↗

Bridge
- 🔑 AssetID ↗
- BridgeNumber t
- BridgeID t
- 🔑 Name t
- Nickname t
- Status t
- LifecyclePhase t
- ReportToFHWA b
- ReportElementsToFHWA b
- PastAssetID ↗
- FutureAssetID ↗
- HistoryID ↗

EventInspectionType
- 🔑 EventID ↗
- 🔑 InspectionTypeID ↗
- HistoryID ↗

InspectionSchedule
- 🔑 ID t
- 🔑 EventID ↗
- 🔑 InspectionTypeID ↗
- IsRequired b
- IsBeingPerformed b
- LastInspectionDate d
- NextInspectionDate d
- IntervalMethod t
- IntervalMonths #
- HistoryID ↗

Home

Inspection

Load Ratings

Sketches

Procedures

Logistics

Load Posting Status

Condition

Identification

Design

Work Candidates

Equipment

Work Events

Inspection List

Home

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Welcome to the AASHTOWare™ Bridge Management version 7.0!

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Inspection List

Condition

Bridge *
01001

Bridge Name (B.ID.02)
01001_

Bridge Nickname

Inspection *
09/19/2017

Condition Ratings

Deck (B.C.01)
6 Satisfactory

Substructure (B.C.03)
6 Satisfactory

Bridge Condition Classification (B.C.12)
F Fair

Railing (B.C.05)
0 Failed

Bearing (B.C.07)

Superstructure (B.C.02)
5 Fair

N Not Applicable
9 Excellent
8 Very Good
7 Good
6 Satisfactory
5 Fair
4 Poor
3 Serious
2 Critical
1 Imminent Failure
0 Failed

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Bridge Management

Parameters

Options

Vehicles

Multimedia

Procedures

Sketch Templates

Page Builder

Inspection Types

Equipment

Layouts

Filters

Dashboard Chart Templates

Certifications

Copy Form

New Form

Bridge *

Bridge Name (B.ID.02)

Inspection *

Condition Ratings

Deck (B.C.01)

Superstructu

Substructure (B.C.03)

Culvert (B.C.

Bridge Condition Classification (B.C.12)

Lowest Cond

⊘ Cancel

Field Input Settings

Nickname

☑ Show Name

Column Width *

4

☑ Edit Security

Form Data

☑ Required

☐ Read Only

Data Field

Type *

Bridge

Field *

Nickname

Control Specific

Contributing States – THANK YOU!!

- 22 States with Full Participation

- 2 Partial Contributions

- Alabama, Arizona, Caltrans, Delaware , Florida, Hawaii, Idaho, Kansas, Kentucky, Louisiana , Michigan , Minnesota, Mississippi, Montana, Nebraska, New Jersey , North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Utah, Virginia, Wyoming
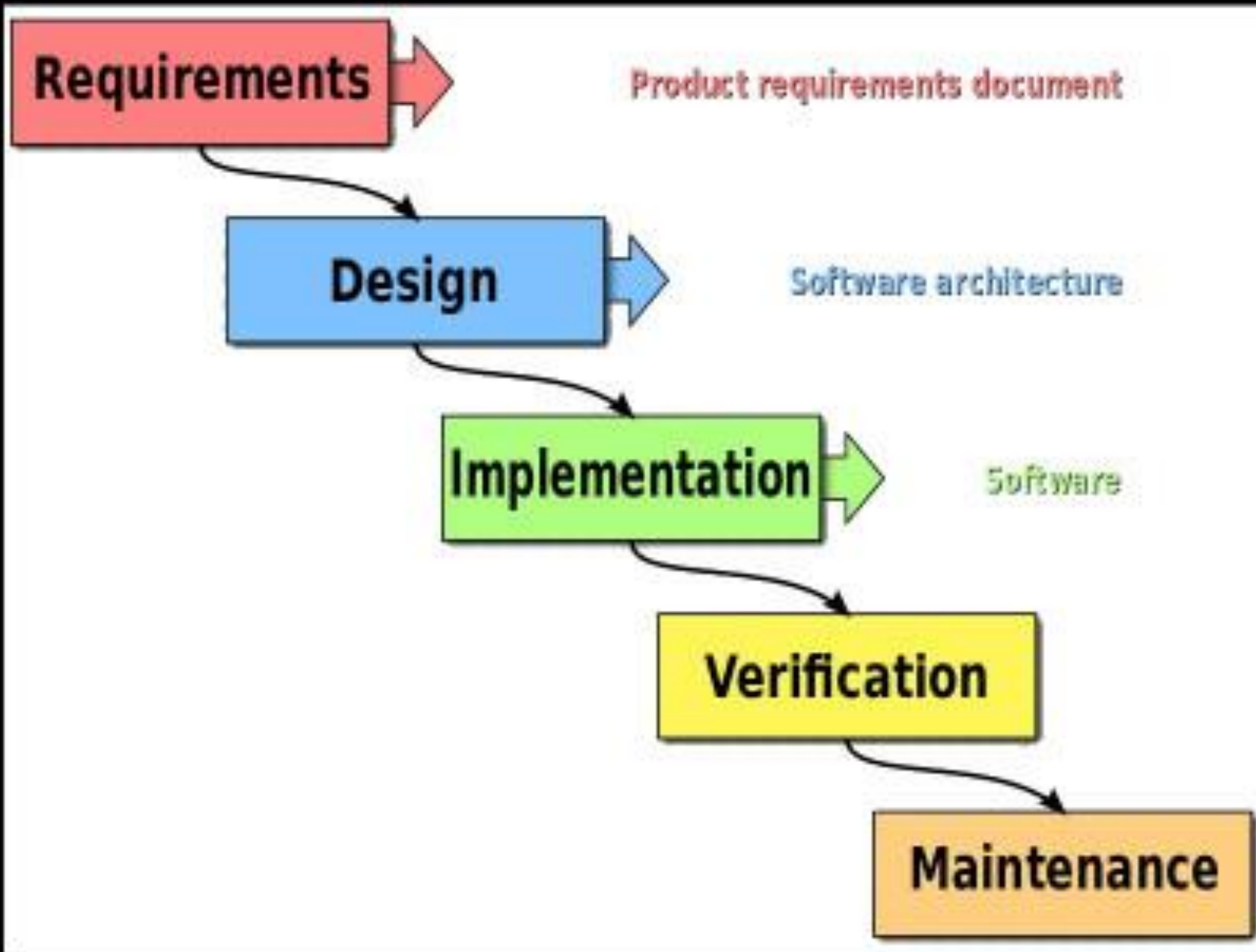

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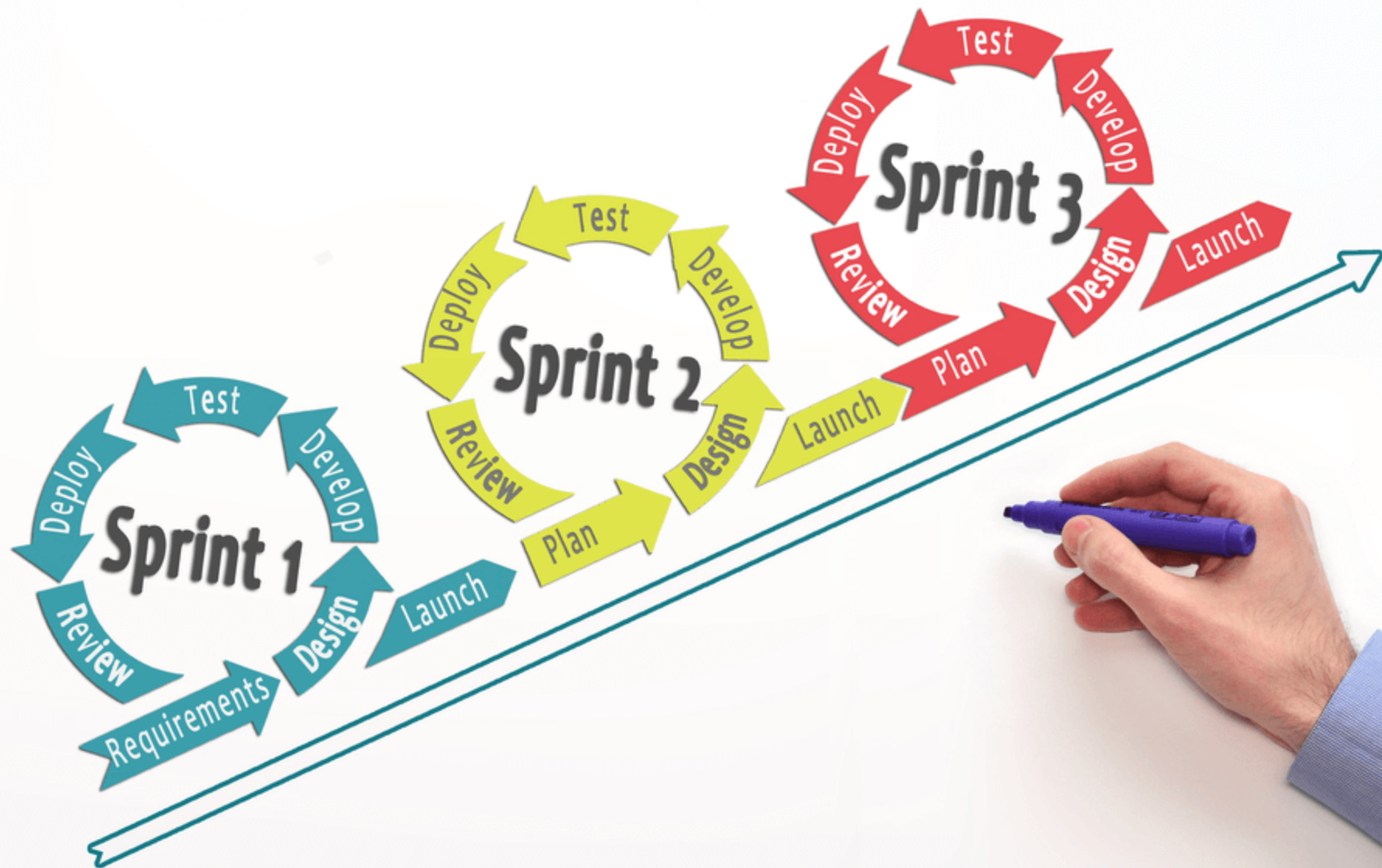MANAGEMENT

Retirement: Workstation

- Workstation was a version of BrM that allowed for standalone installation

- Intended to be used as a laptop version for field use

- Security concerns with how data was exchanged

- Modern way to collect field data is with mobile application
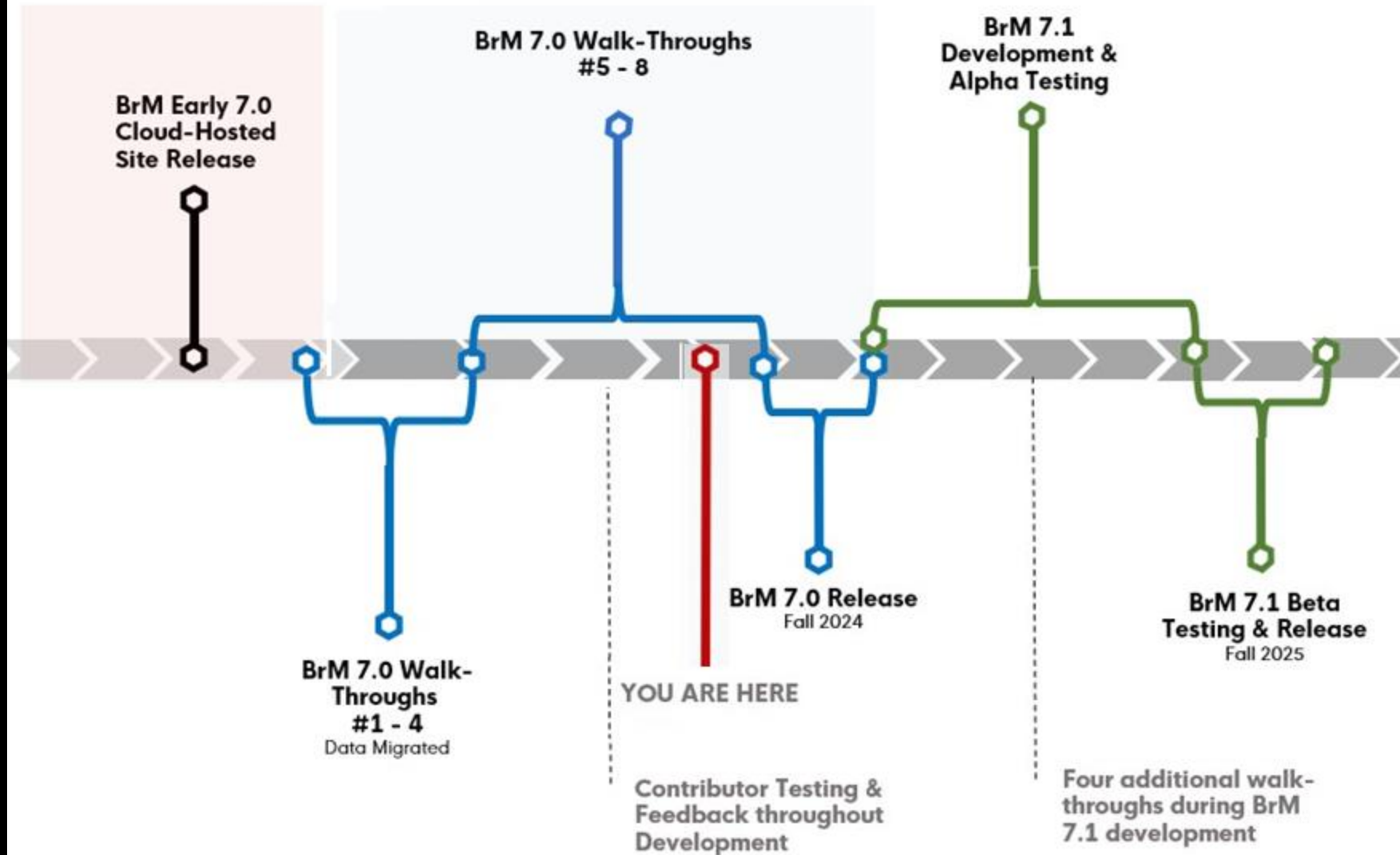

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Retirement: Import/Export

- BrM 6.X allows import of flat files
- Wide open door, large security concern
- Task Force has decided to reduce import functionality:
  - According to new JSON standard
  - Work with Mayvue (covered under standard support)

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BrM 7.0 / 7.1 High-Level Schedule

BrM Early 7.0 Cloud-Hosted Site Release

BrM 7.0 Walk-Throughs #5 - 8

BrM 7.1 Development & Alpha Testing

BrM 7.0 Walk-Throughs #1 - 4
Data Migrated

YOU ARE HERE

BrM 7.0 Release
Fall 2024

BrM 7.1 Beta Testing & Release
Fall 2025

Contributor Testing & Feedback throughout Development

Four additional walk-throughs during BrM 7.1 development

Where we're going – BrM 7.1

- Update modeling and management modules to accommodate new fields & database updates.
- Modernize BrM with latest technologies to improve performance.
  - Life Cycle Cost Analysis
  - Projects Module
  - Optimizer
  - Network policies
  - Enhancements to the API

When we're going

BrM 6.7
March 2023

SNBI Collector
June 2023

BrM 7.0
November 2024

BrM 7.1
Fall 2025

Spring 2025
(Last 1995 Coding Guide Submittal)

Summer 2026
(TAMP Due)

Security Scans

Internal Process

- Every release, Mayvue performs a security scan
  - Penetration testing
  - Vulnerability scans
- AASHTOware (T&AA) has an IT security expert on contract to perform independent scans

External Process

- Will be triaged and addressed according to actual severity.
- Please be careful about posting scan results
- File a ticket in JIRA with high level concerns

API: Application Programming Interface

- Provides an intermediary between application and database
- Enlists several advantages:
  - Provides consistency through evolution of the database
  - Adds ability to add validation rules
  - Enhances security by reducing abstracting database
- **Please make all integrations moving forward use the API as opposed to direction database connections**

App → API → DB
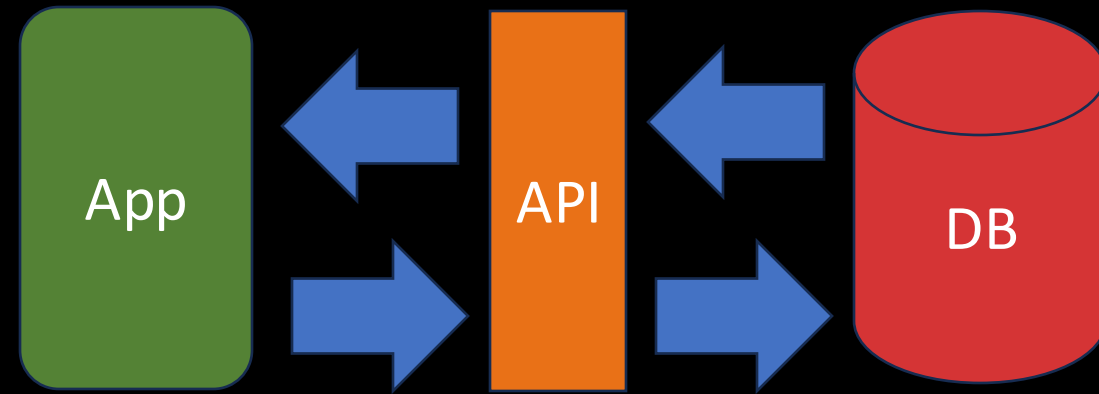
Strategic Vision - OpenAPI

- Increase product integrations through AASHTOware Alliance Program and OpenAPI
- Current API features:
  - OpenAPI compliance
  - API versioning
- Future API features:
  - Business validation /Data integrity verifications
  - API call logs/change history tracking
  - Field-level security enhancements

Strategic Vision – BrM Cloud Hosting

- BrM is looking to move away from on-premises installations.
- We expect following benefits:
  - Efficiency gains:
    - Upgrades
    - Ticket resolution
    - IT headaches
  - Top-Tier Security: Enlist industry standards for security and data protection
  - Comprehensive Hosting: DEV, TEST and PROD environments
  - System Audit Logging
  - Reduced Support Costs

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Strategic Vision – Short Term Priorities (~3 years)

- SNBI Implementation
- Configuration First
- AASHTOware Product Integrations
- Data Governance – SSOT
- Enhanced Mapping Integrations (ESRI)

Strategic Vision – Medium Term Priorities (3-6 years)

- BrR Model Viewing Native to BrM

- Expand Asset Optimization

- Cloud Hosting

- Public data risk analysis

- Spatial Awareness Optimization / Corridor Improvements

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Strategic Vision – Long Term Priorities (6+ years)

- Non-destructive Testing Data Integration
- Location based defect tracking (BIM)

Task Force Update

AASHTOware BrM User Group Meeting
Long Beach, CA
September 17-18, 2024

David Hedeen, P.E.
BrM Task Force Chair
Minnesota DOT | Bridge Office
david.hedeen@state.mn.us