Choose-Your-Own-Conference Adventure: Track 3

Data Management

2022
Conference on Performance-Based Management, Planning, and Data
AASHTO

Lou Anne Daugherty, Moderator

CATCH intelligence
lead by knowing

Track Sponsor

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Track Agenda

- **Session 1: Managing Data Collected with Mobile Devices**
  - Greg Ciparelli, Connecticut DOT
- **Session 2: Joint Subcommittee on Data Standards—What's Going On?**
  - Mike Bousliman, Montana DOT
- **Session 3: Data Management Strategy for the Enterprise**
  - Mark Floersch, CATCH Intelligence

Session 1:
Managing Data Collected with Mobile Devices

Greg Ciparelli, Connecticut DOT

Managing Data Collected With Mobile Devices

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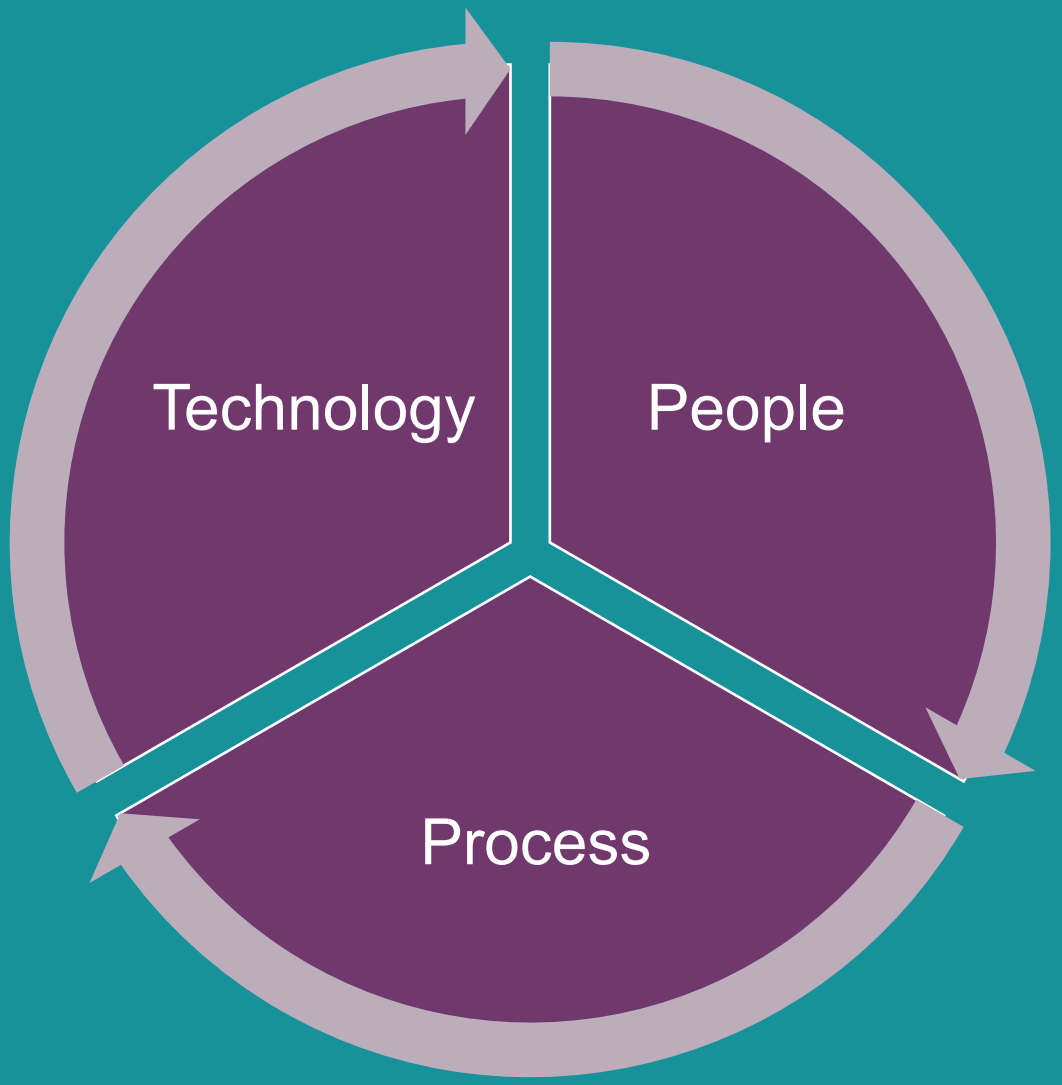
Gregory Ciparelli

Many applications allow users to collect field data via mobile devices (phone/tablets). Learn how DOTs are managing the collection and editing of this data.



Due to the additional complexities of mobile data collection, these 3 components really need to work together towards building a sustainable solution.

The Basics

- Know Your Systems & Architecture
- Know Your Resources
- Understand Your Existing Processes
- Understand & Appreciate the User Environment
- Have a Clear Goal
- Demonstrate Value

Know Your Systems & Architecture

- Is this application standalone or dependent upon accessing other systems' data?
- Does this application need to write back or otherwise communicate with a different system or database?
- How does your architecture handle edits?
  - Versioned ArcSDE?
  - Relationships?
  - Maintaining history?
- Limitations of the platform?
  - Survey123 & Versioned Environments
  - Workforce with inflexible schema

Know Your Resources

- Technology
  - What types of devices does the agency support?
  - Do the right people have access to the right devices?
  - Is there the ability to enable location services? Do you need it?
  - Is the software compatible?
- Personnel
  - Is there a confirmed list of expected users/roles?
  - Does this fit within their job description?
- Licensing
  - How is security/access/login credentials handled?
  - Are all the components licensed at an appropriate level?

Understand Your Existing Processes

- Is this a complete rebuild of a process with opportunities to improve?
- Is the process mature and the steward is primarily looking to upgrade the technology/accessibility?
- Are there gaps in the process that can be addressed?
- Can you create communication pipelines through utilization of the application?
- What are the pain points in the existing process?

Understand & Appreciate the User Environment

- Mobile data collection presents safety challenges
- Infrastructure/Connectivity can create issues
- Be weary of adding responsibilities
  - The goal is to make it easier to do their job, adding even small components will be perceived as potentially making it more complicated/cumbersome
  - Need to directly correlate new components with value to user
- Training, Training, Training
- Listen to the users, it won't succeed without their buy-in
- Identify advocates & change agents

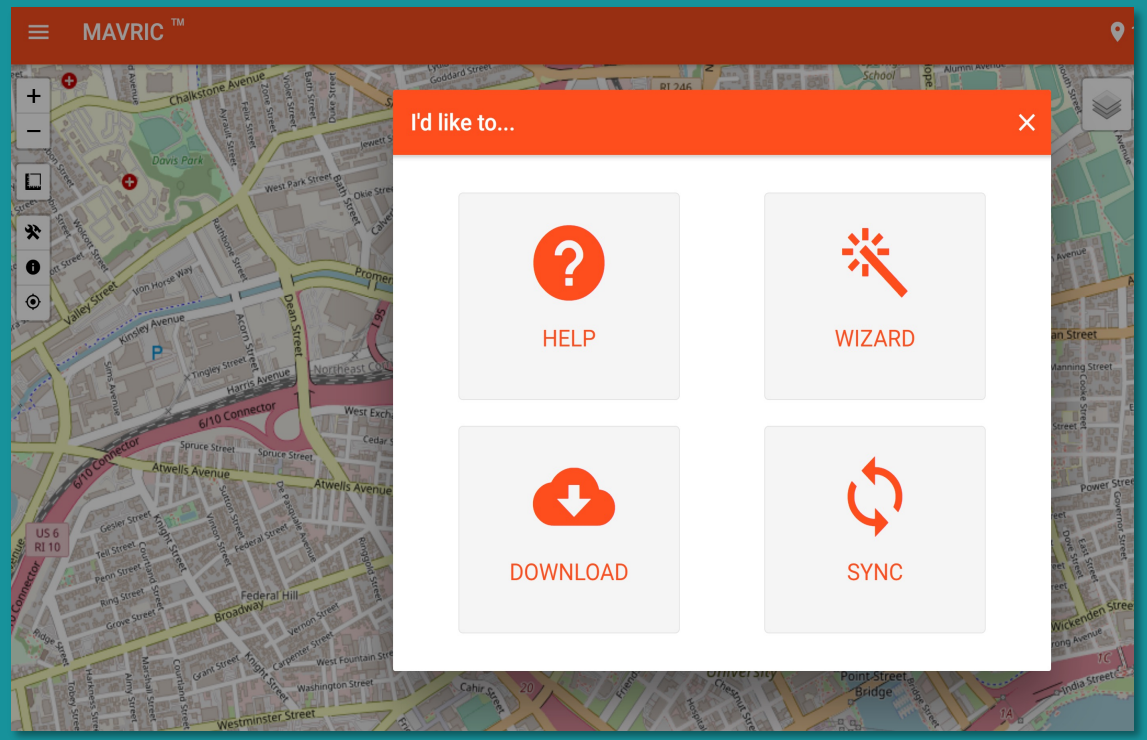
Have a Clear Goal

- Document clear business requirements of the application
  - Identify all involved parties
  - Separate out essential components from enhancement requests
  - Identify a process for reconciling requests
- Set target dates for stages of deployment
- Obtain buy-in from Management
  - Without direction that this is now “the way” there’s risk of holdouts/workarounds
- Agile approach, but avoid scope creep
  - Treat the personnel as a “customer”

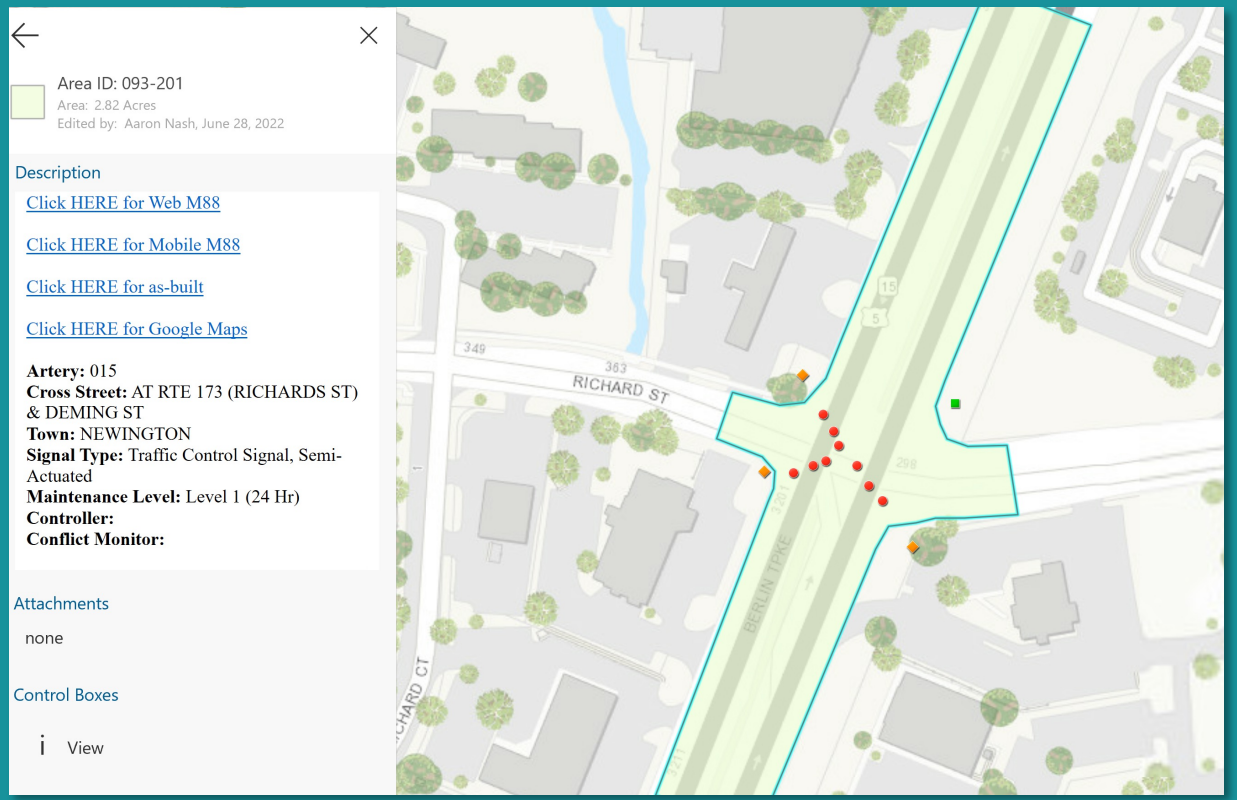
Demonstrate Value

- Value to the User vs Value to the Agency
  - Intuitive applications easier for new staff
  - Access of work to decision makers
- Collect once, make accessible, use many
  - Daily work reports?
  - Justification for more funding?
- Higher data quality and confidence
  - Linking data directly reduces research time or redundancy
- ***High visibility of the critical work they do everyday!***

Linear Referencing System Network & Asset Collection



Traffic Signals Maintenance Report Maintenance 88 Form



Road Network & LRS Asset Data Mobile Collection Tool

Mobile **A**sset **V**erification and **R**oadway **I**nventory **C**ollection (MAVRIC)

Rebranded by Rizing Geospatial as *OmniSpatial*

Roadway Data Mobile Collection - History

No geospatial component to Access application – strictly driven LRS based

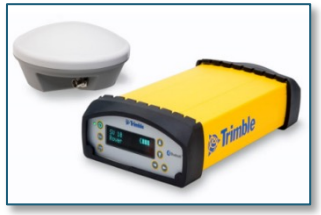
Limited attribution – character limits

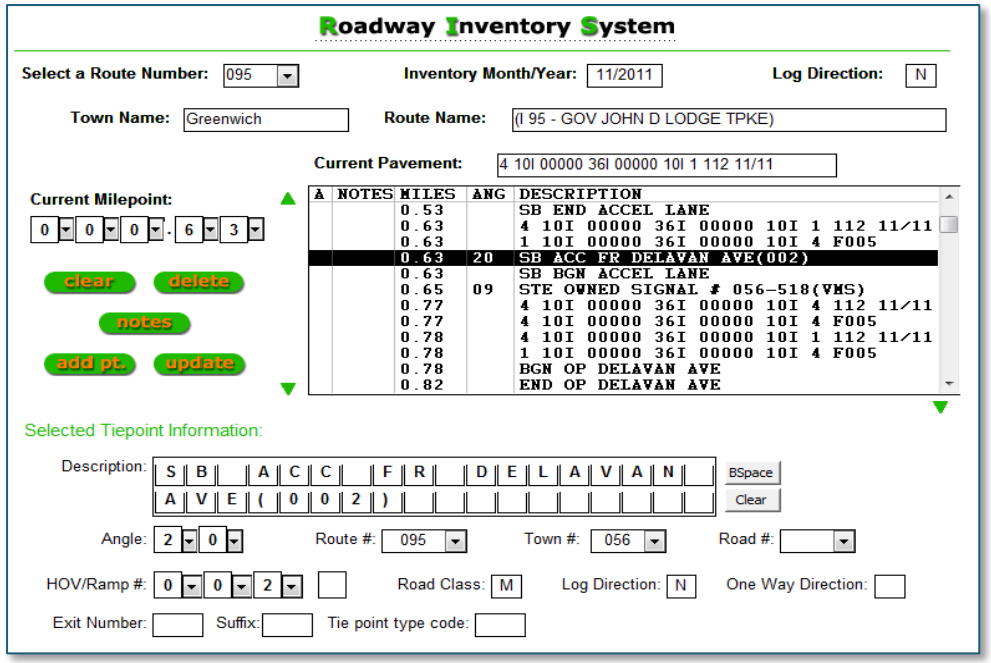
Wouldn't support expanded asset attribution

Limited access – Whole route & all assets locked

Roadway Inventory Personnel were only editors

Disconnected systems - all integration of data required time consuming post processing



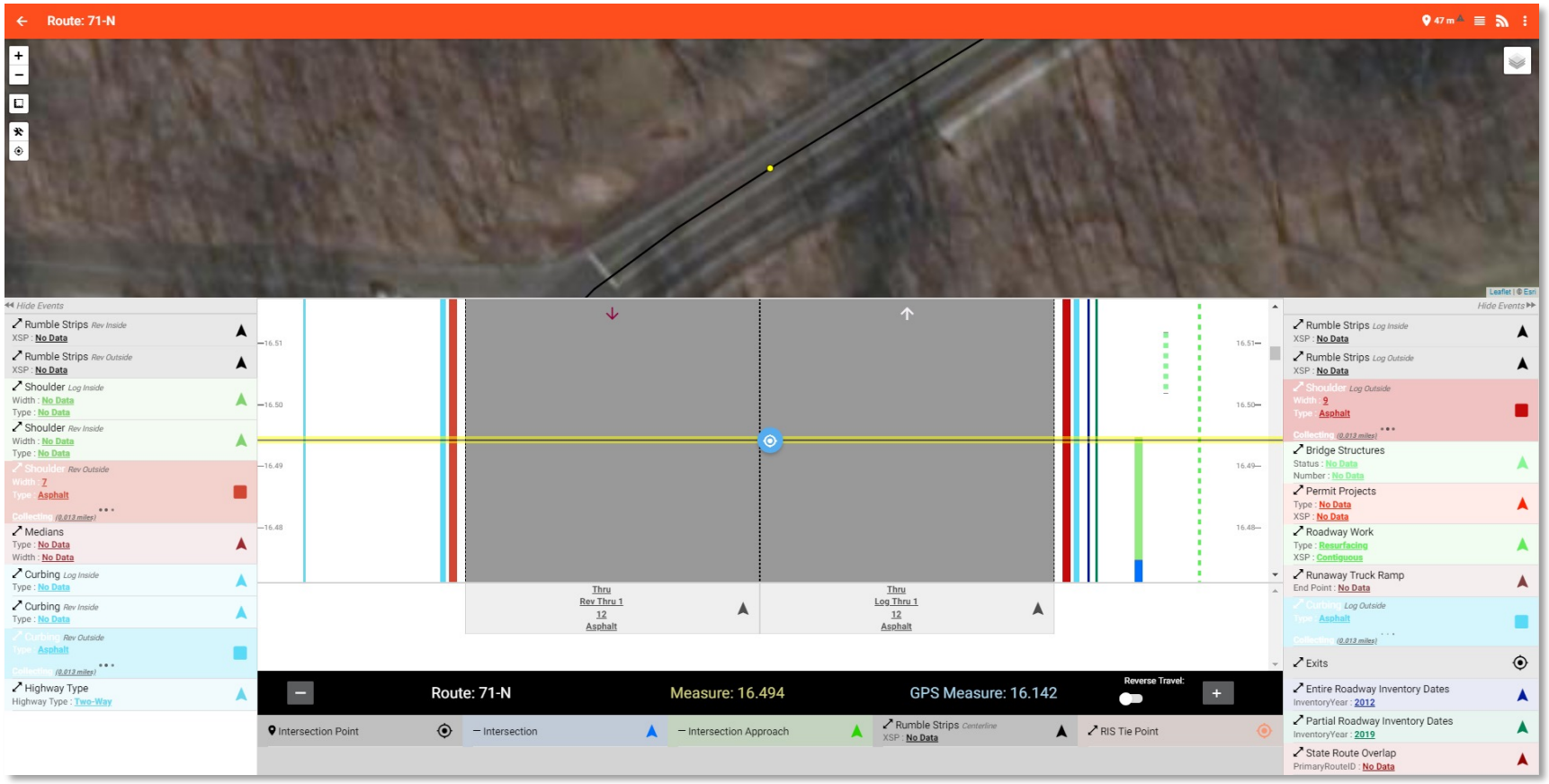


Aspects of the methodology were sound, but the technology was extremely limiting.

Keep the methods

Upgrade the technology

High Level Concept



A browser-based roadway and asset data field collection web application that works in connected or disconnected environment, caches data locally within the browser, is GPS tracking enabled, and supports parallel (e.g. multiple asset simultaneous) data collection efforts for creating or modifying road network and asset data in a simple interactive user interface

Business Requirements – Features & Functionality

Utilize the Geospatial LRS of Record

- Ability to load current LRS roadway geometry for asset and attribute referencing
- Snap attribution and/or assets to appropriate route – use GPS tracking for location purposes
- Ensures continuity in data collection and location referencing
- QA/QC process before integration back to system of record

Review/Collect Multiple Assets Concurrently (Parallel Collection)

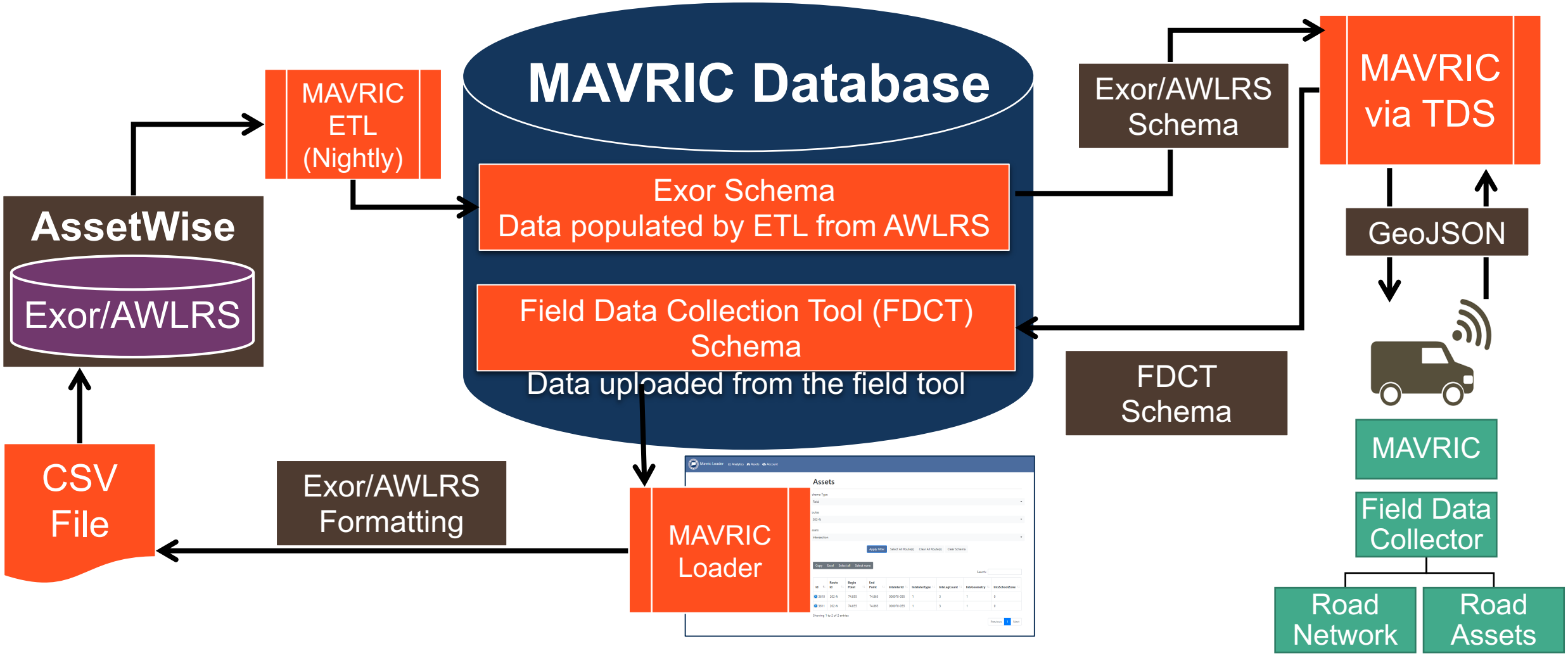
- Singular Asset/Attribute collection requires time consuming repeat reviews
- Planning data has expanded with MIRE to cover a wide variety roadway characteristics
- Need for possible expansion of collectable data elements – build for asset type (e.g. point, line, polygon) as opposed to specific assets

Integrated Visual Display of Data Elements & Attributes

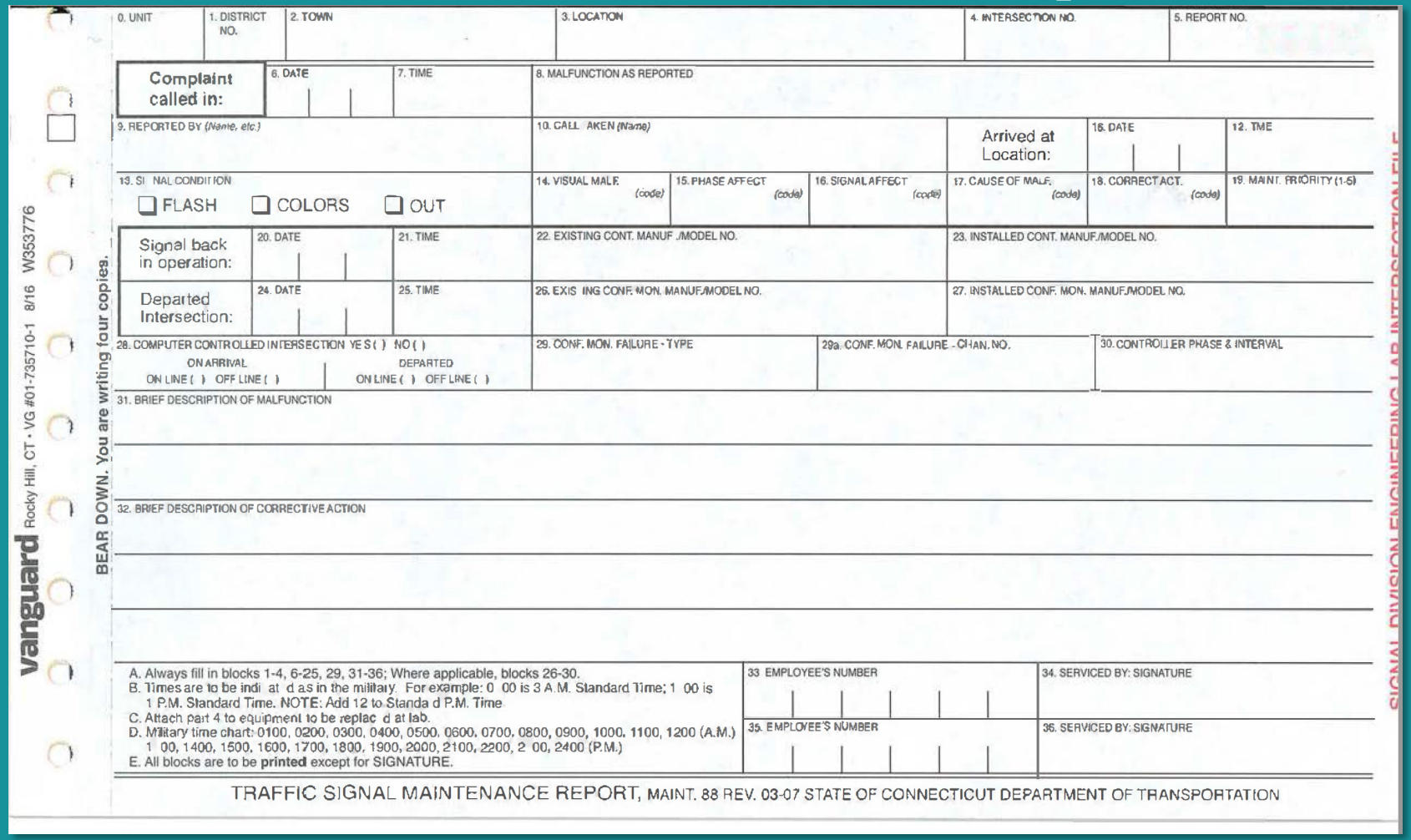
- Real time visual interaction with collected/modified assets and attribution
- Simplified heads up, asset-based, visual display that is touch screen enabled
- Multiple views of data depending on collection type (e.g. Map View, Road View, SLD View)

Data Flow Diagram

MAVRIC STG LINK



Maintenance-88 Form Replacement



vanguard Rocky Hill, CT • VG #01-735710-1 8/16 W353776

BEAR DOWN. You are writing four copies.

0. UNIT	1. DISTRICT NO.	2. TOWN	3. LOCATION	4. INTERSECTION NO.	5. REPORT NO.

Complaint called in:	6. DATE	7. TIME	8. MALFUNCTION AS REPORTED

9. REPORTED BY (Name, etc.)	10. CALL TAKEN (Name)	Arrived at Location:	11. DATE	12. TIME

13. SIGNAL CONDITION ☐ FLASH ☐ COLORS ☐ OUT	14. VISUAL MALF. (code)	15. PHASE AFFECT (code)	16. SIGNAL AFFECT (code)	17. CAUSE OF MALF. (code)	18. CORRECT ACT. (code)	19. MAINT. PRIORITY (1-5)

Signal back in operation:	20. DATE	21. TIME	22. EXISTING CONT. MANUF./MODEL NO.	23. INSTALLED CONT. MANUF./MODEL NO.
Departed Intersection:	24. DATE	25. TIME	26. EXISTING CONF. MON. MANUF./MODEL NO.	27. INSTALLED CONF. MON. MANUF./MODEL NO.

28. COMPUTER CONTROLLED INTERSECTION YES ( ) NO ( ) ON ARRIVAL ON LINE ( ) OFF LINE ( ) DEPARTED ON LINE ( ) OFF LINE ( )	29. CONF. MON. FAILURE - TYPE	29a. CONF. MON. FAILURE - CHAN. NO.	30. CONTROLLER PHASE & INTERVAL

31. BRIEF DESCRIPTION OF MALFUNCTION

32. BRIEF DESCRIPTION OF CORRECTIVE ACTION

A. Always fill in blocks 1-4, 6-25, 29, 31-36; Where applicable, blocks 26-30.
B. Times are to be indicated as in the military. For example: 0 00 is 3 A.M. Standard Time; 1 00 is 1 P.M. Standard Time. NOTE: Add 12 to Standard P.M. Time
C. Attach part 4 to equipment to be replaced at lab.
D. Military time chart: 0100, 0200, 0300, 0400, 0500, 0600, 0700, 0800, 0900, 1000, 1100, 1200 (A.M.) 1 00, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100, 2200, 2 00, 2400 (P.M.)
E. All blocks are to be **printed** except for SIGNATURE.

33 EMPLOYEE'S NUMBER	34. SERVICED BY: SIGNATURE
35. EMPLOYEE'S NUMBER	36. SERVICED BY: SIGNATURE

TRAFFIC SIGNAL MAINTENANCE REPORT, MAINT. 88 REV. 03-07 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION

SIGNAL DIVISION ENGINEERING LAB INTERSECTION FILE

Traffic Signals Maintenance Report

Business Requirements

Replace the Paper Driven Process

- Paper and carbon copy process; updates collected, distributed, and filed away at set intervals
- Legal documents subject to FOIA requests
- Legibility an issue
- Free form text and check boxes, many codes to reference on back
- Not searchable, accessibility limited

Create an Environment that Ensures Consistent & Timely Data

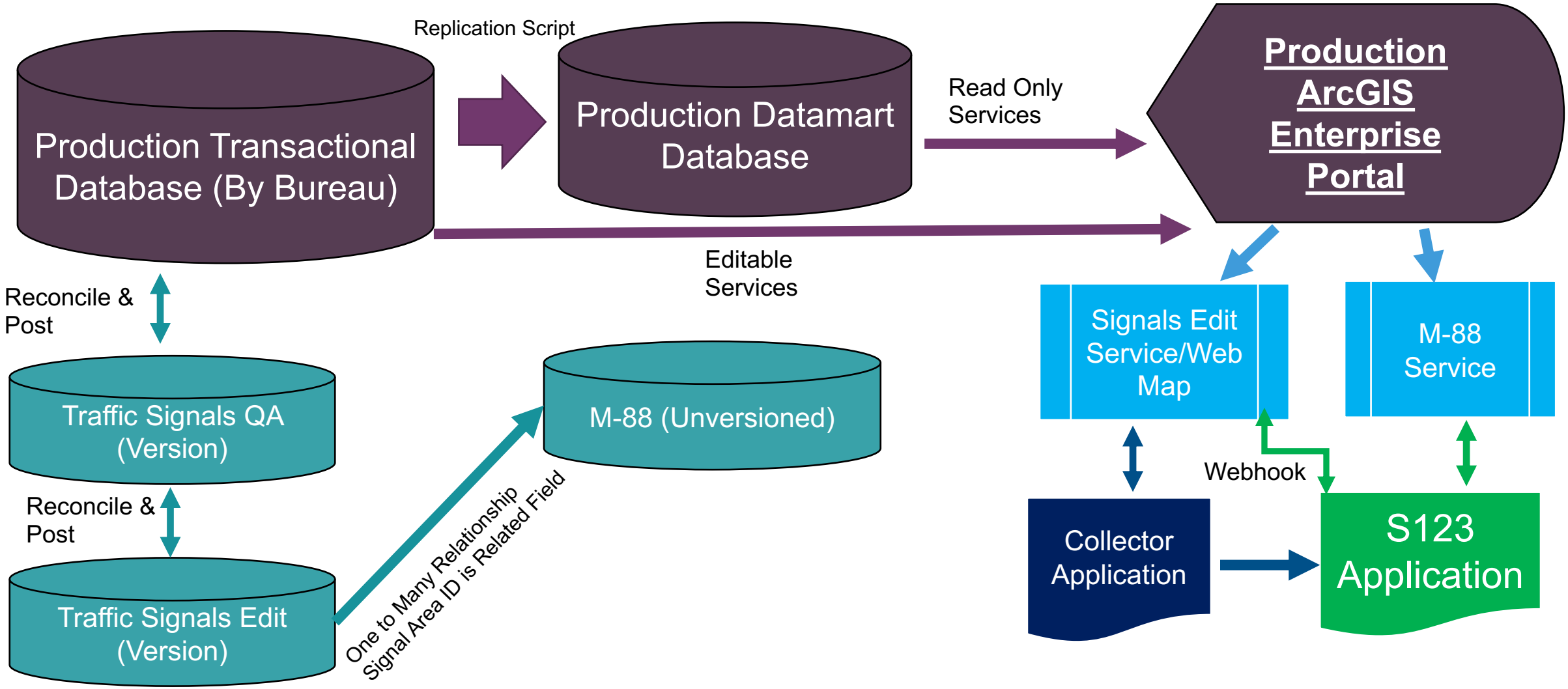
- Set domain values for appropriate fields
- Provide access to those not on CC list
- Timely updates in database ensure work isn't duplicated, creates accessible record of work done

Provide Efficiencies Where Possible

- Access to as-built information
- Provide accessible history of work at location
- Access records to ensure proper equipment is brought to site for repair
- Access data updates performed in Signals Management System

Data Flow Diagram

Hosted in Azure



Questions

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