Michigan Geographic Framework
Geospatial Data Hub

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IMAGIN Conference - June 10, 2019

DTMB

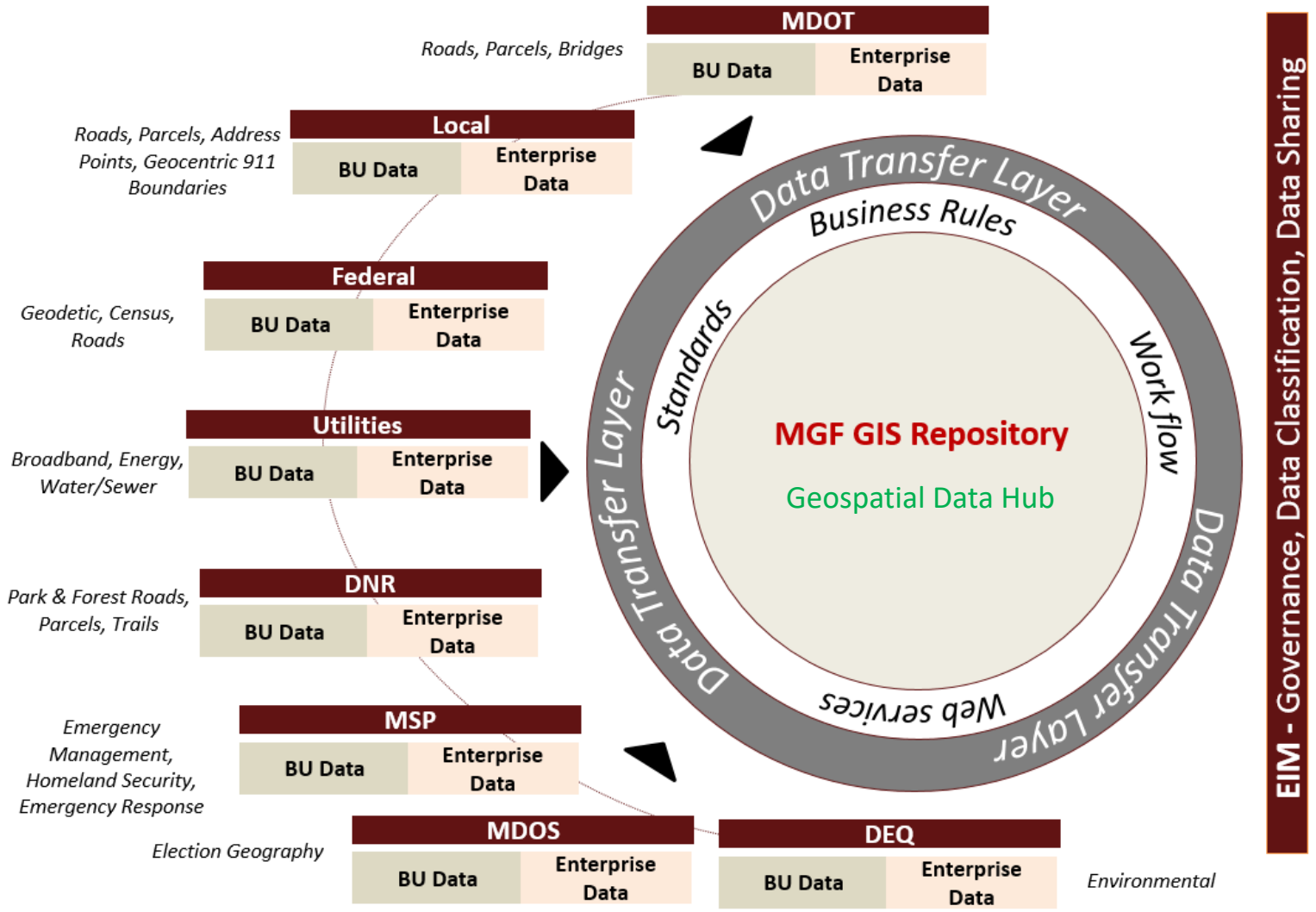
Presentation Agenda

- Project Status
- MGF as Geospatial Data Hub for Michigan
- Example of Data Contributor – Roads and Culverts – MDOT
- Demo of MGF Technology

Project Timeline

- RFP Published in Fall 2016
- Contract Awarded Spring 2017 – ESRI and 1Spatial
- June-October 2017 – Phase 1 - Planning
  - Deliverables Completed
    - Geodatabase Design
    - Data Upload Workflows
    - Business Rules Design
    - Architecture Design
- January 2018-Present – Phase 2 - System Configuration and Implementation
- October 2018-Present – Testing
- June – ESRI Roads and Highways Integration Re-Design, Testing Summer
- June/July – Test Additional Data Layers (Boundaries, Hydrography, Parcels, Address Pts) – Go Live
- Next MGF version release – late summer 2019

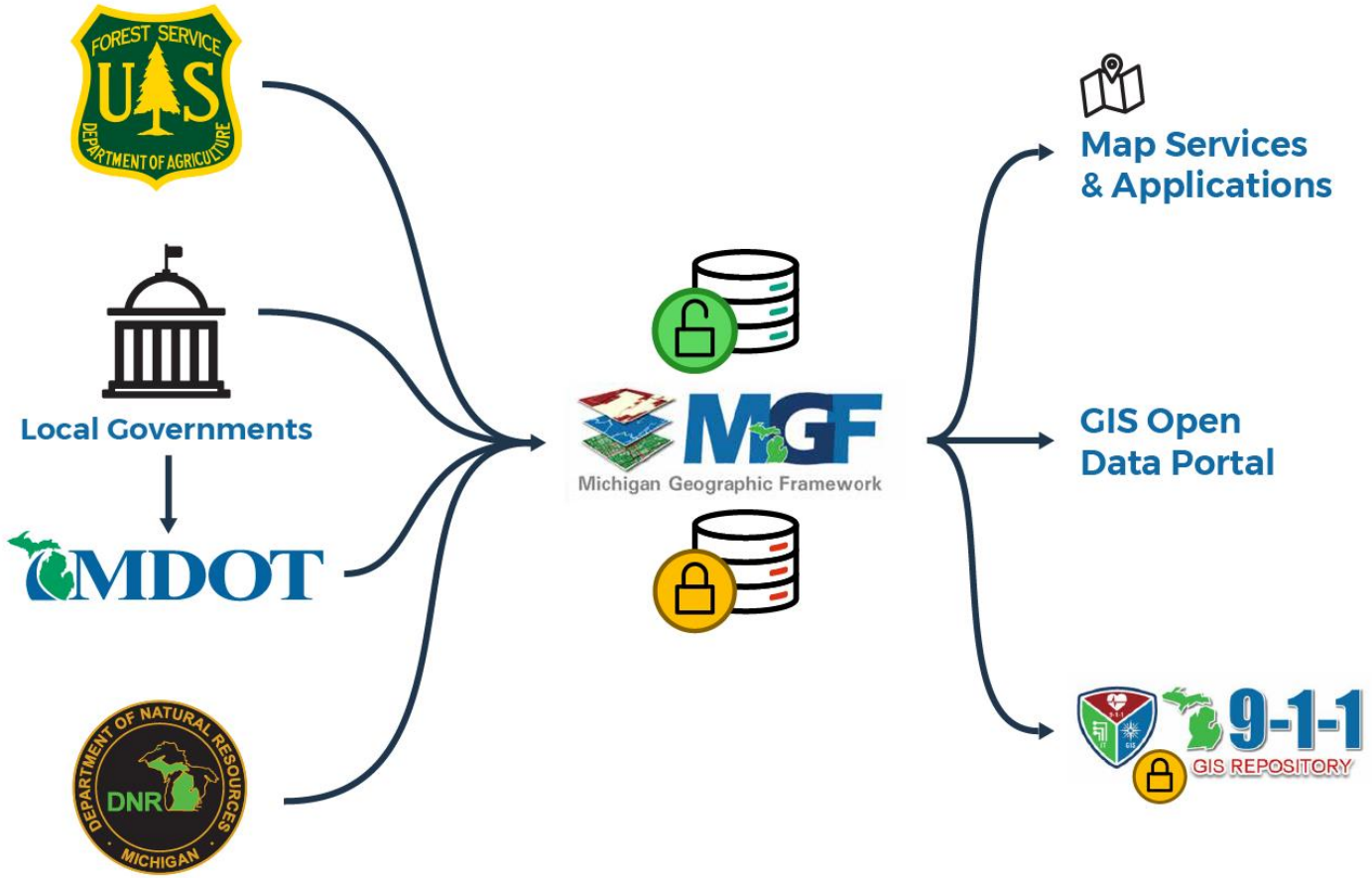
MGF Distributed Editing



Guiding Principles to MGF Geospatial Data Hub

- Create data once, use many times
- Data from authoritative sources
- Data classification by data owners
- Regular data updates and maintenance
- Effective metadata
- Partnerships and data sharing agreements
- Consistent data for decision making
  - Local, state, federal, public

MGF Geospatial Data Hub Road Centerline Data Flow



MDOT - Roads & Highways

- What is Roads & Highways?
  - Developed by ESRI this is an Enterprise Linear Referencing System
  - A database where we store, maintain, and edit our three LRNs
  - The database contains over 100 registered events
    - Each consists of one normalized data item
    - An event is registered to the network based on the PR and Mile Point
    - Common events include Legal System, Lane, and Traffic Segment
  - The GIS Unit maintains the “shells”, while the business area maintains the data through an editing workflow

MDOT - Roads & Highways

LRS Networks contain polylines used for measurement called "routes"

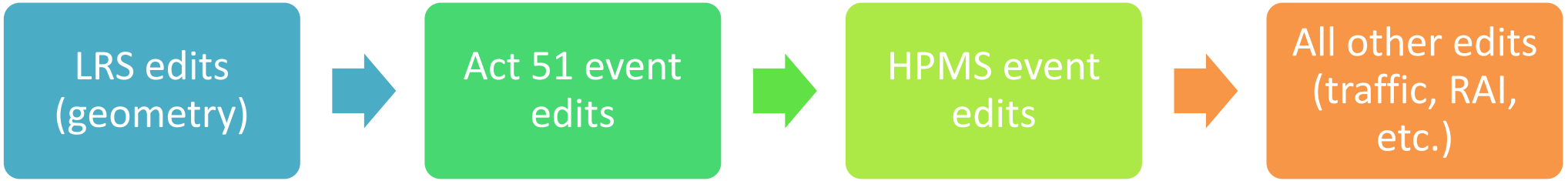
LRS Events are point locations or linear extents that are referenced against a route

Event ID	Route	From Measure	To Measure	Business Data
1	1001	2	8	55 mph

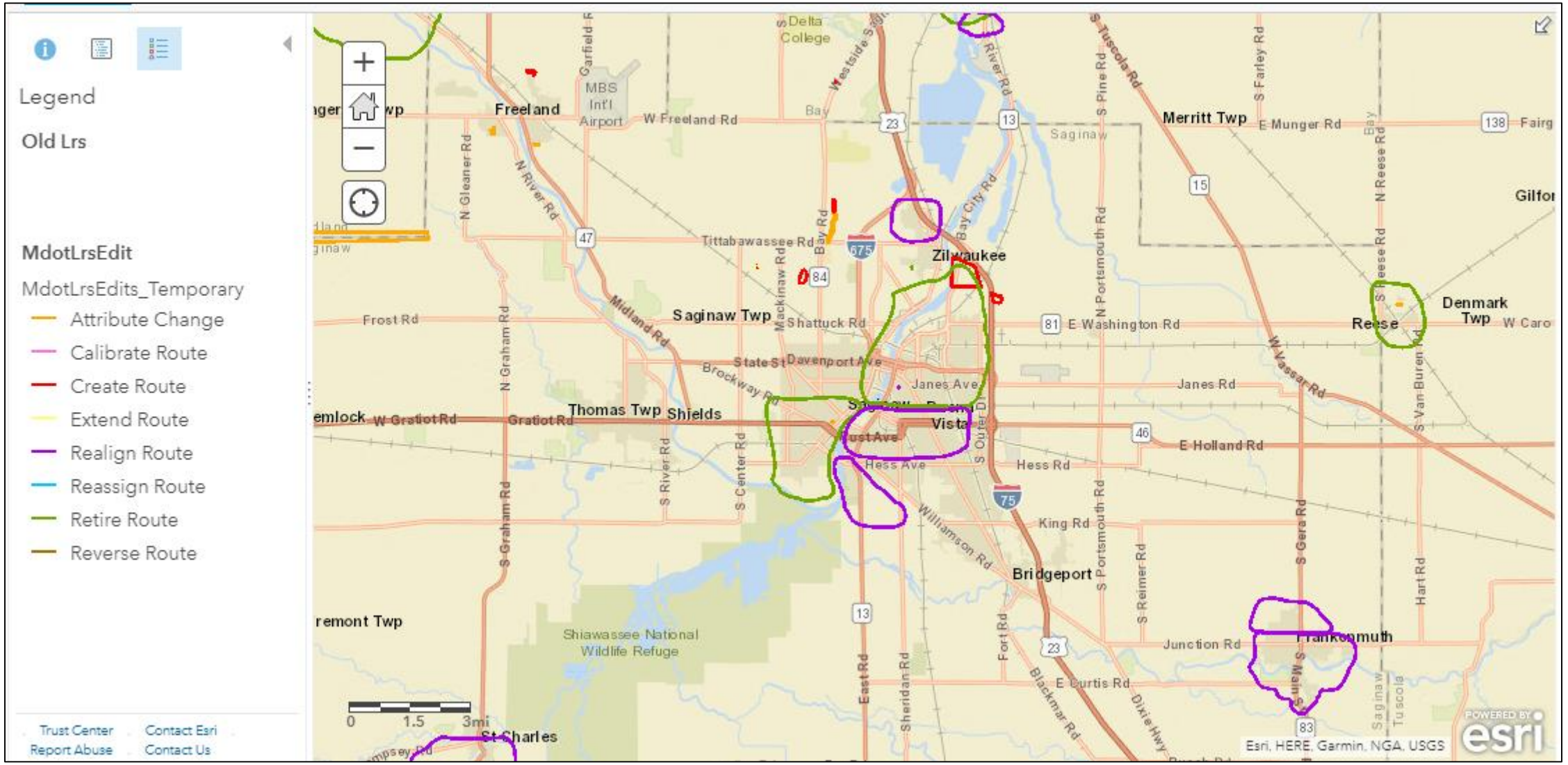
Event ID	Route	Measure	Business Data
1	1001	4	Crash

MDOT - Linear Referencing and Event Maintenance

- Making edits to the road network
  - Typically occur for road additions, retires, and alignment corrections
- What does an editing workflow look like?
  - Any edits made to a road segment migrate through different business areas that have events registered to that segment
  - Notifications are received from upstream business areas



MDOT - Linear Referencing and Event Registration



MDOT Michigan Department of Transportation

GIS UNIT Michigan Department of Transportation

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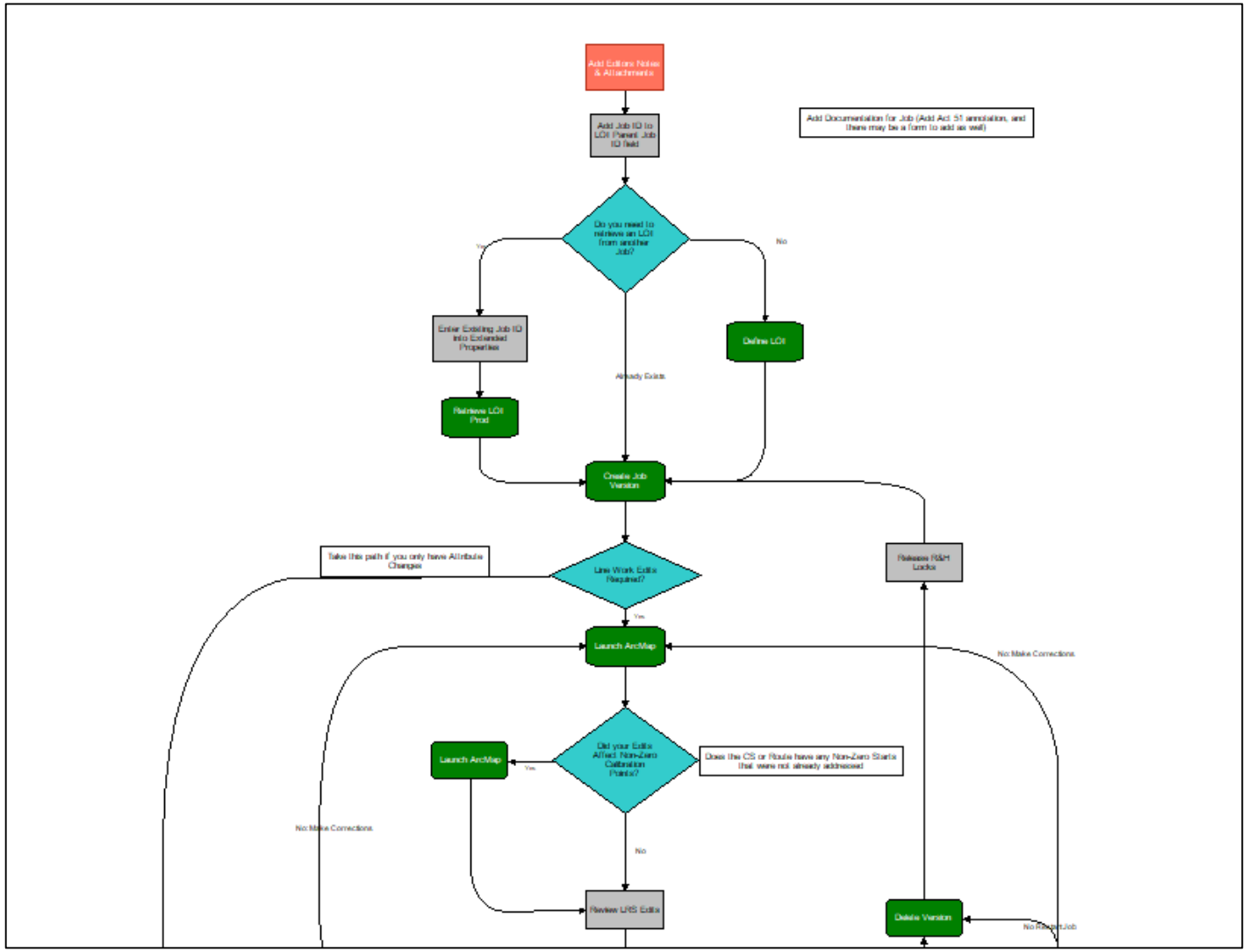

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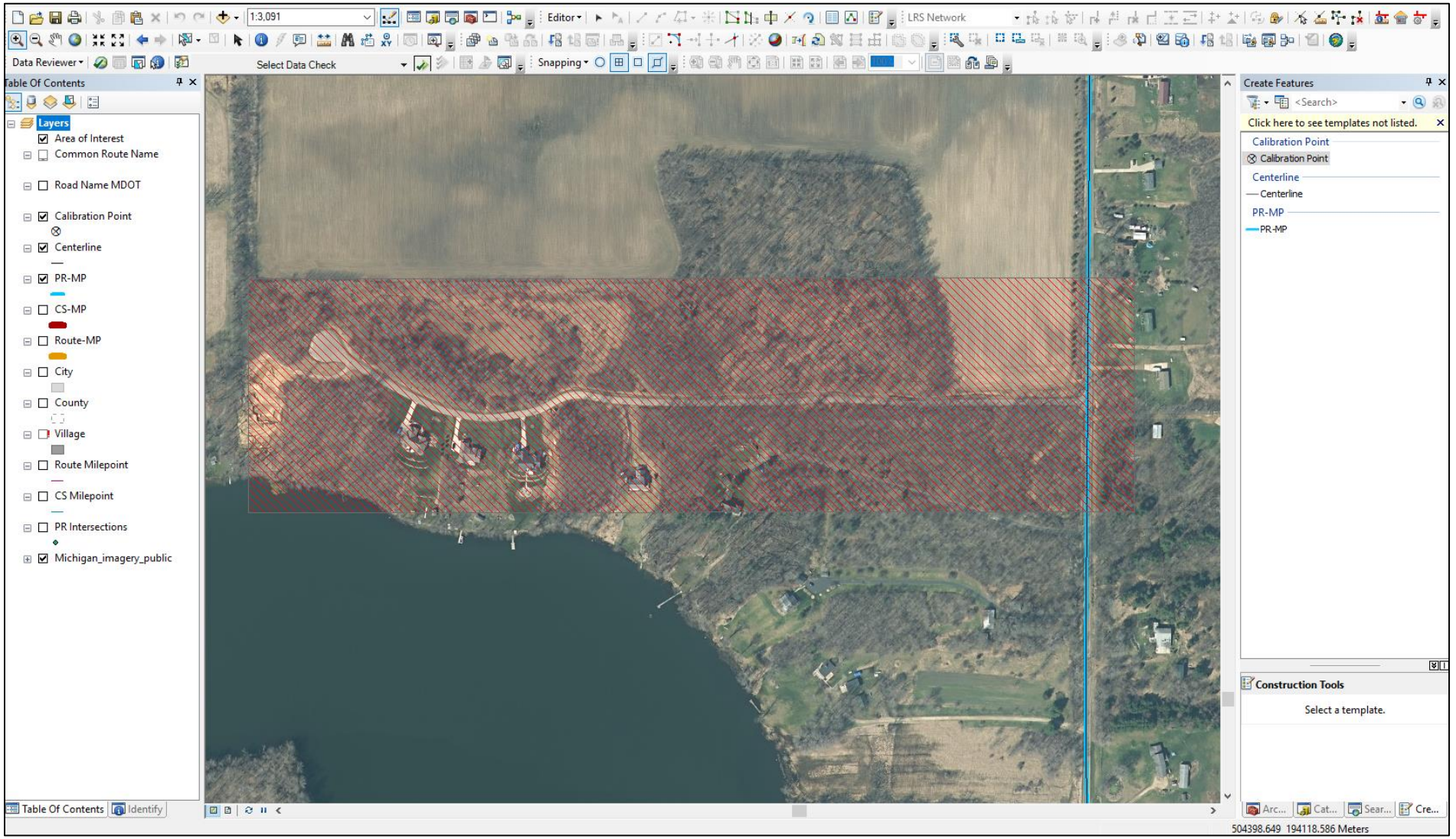

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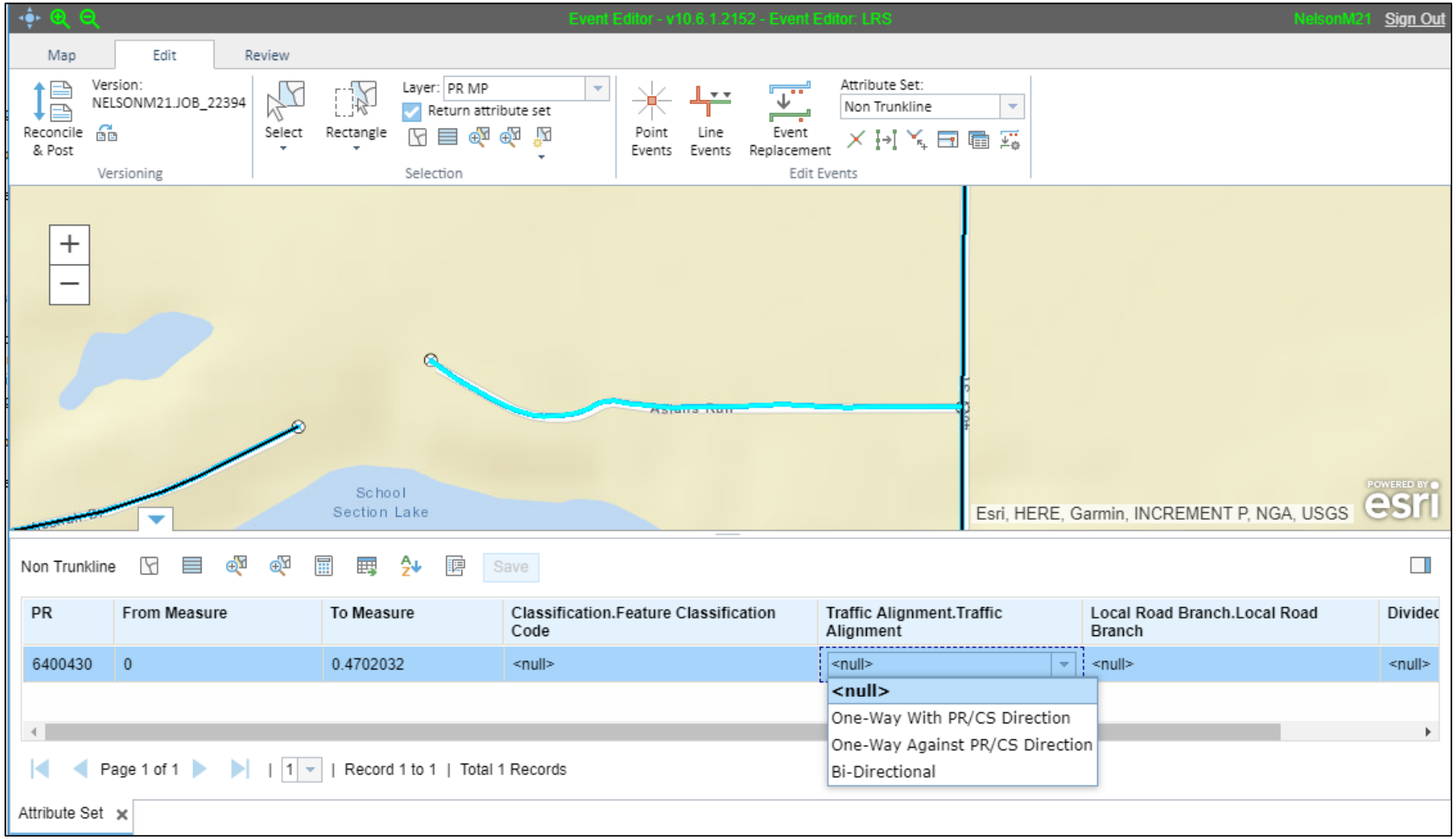

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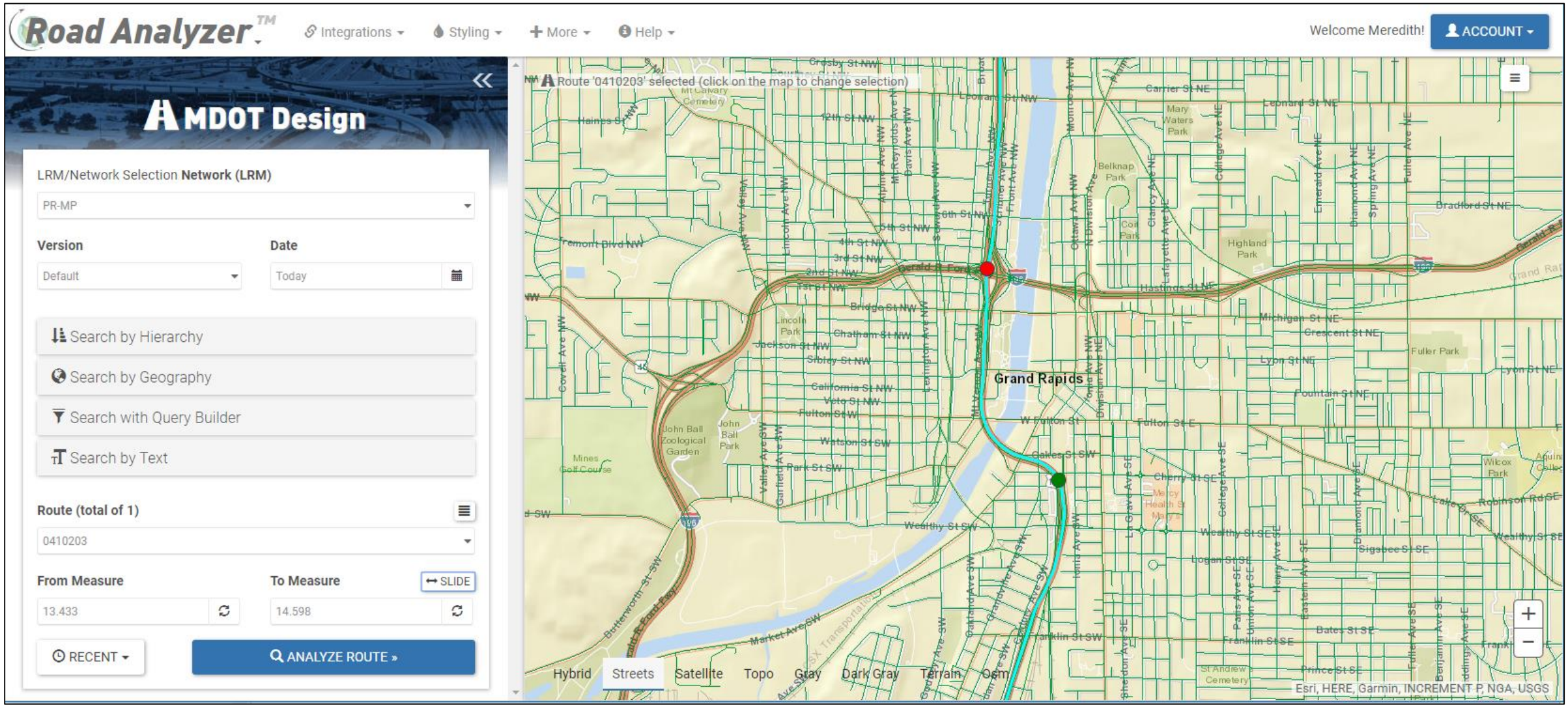

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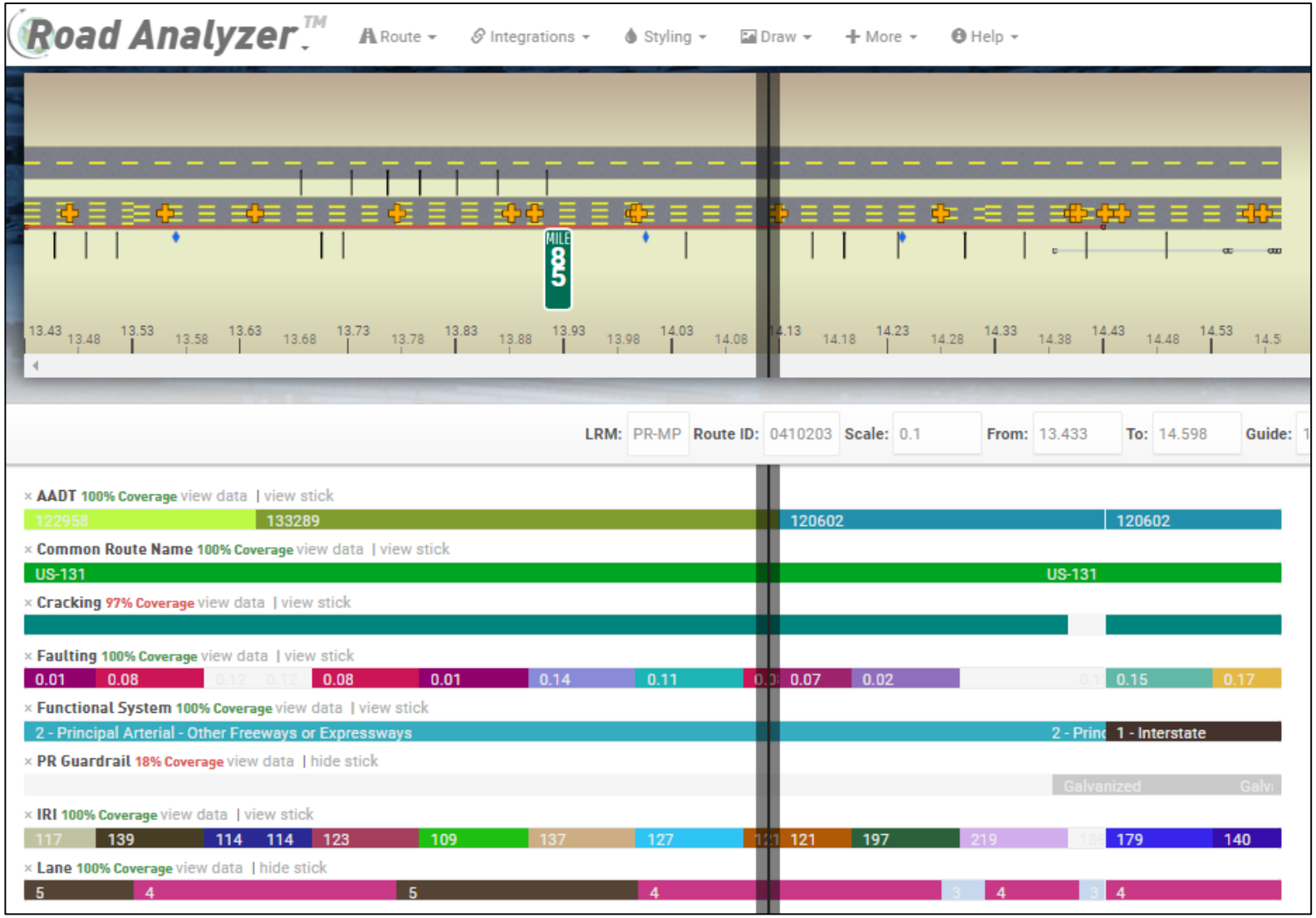

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GIS UNIT Michigan Department of Transportation

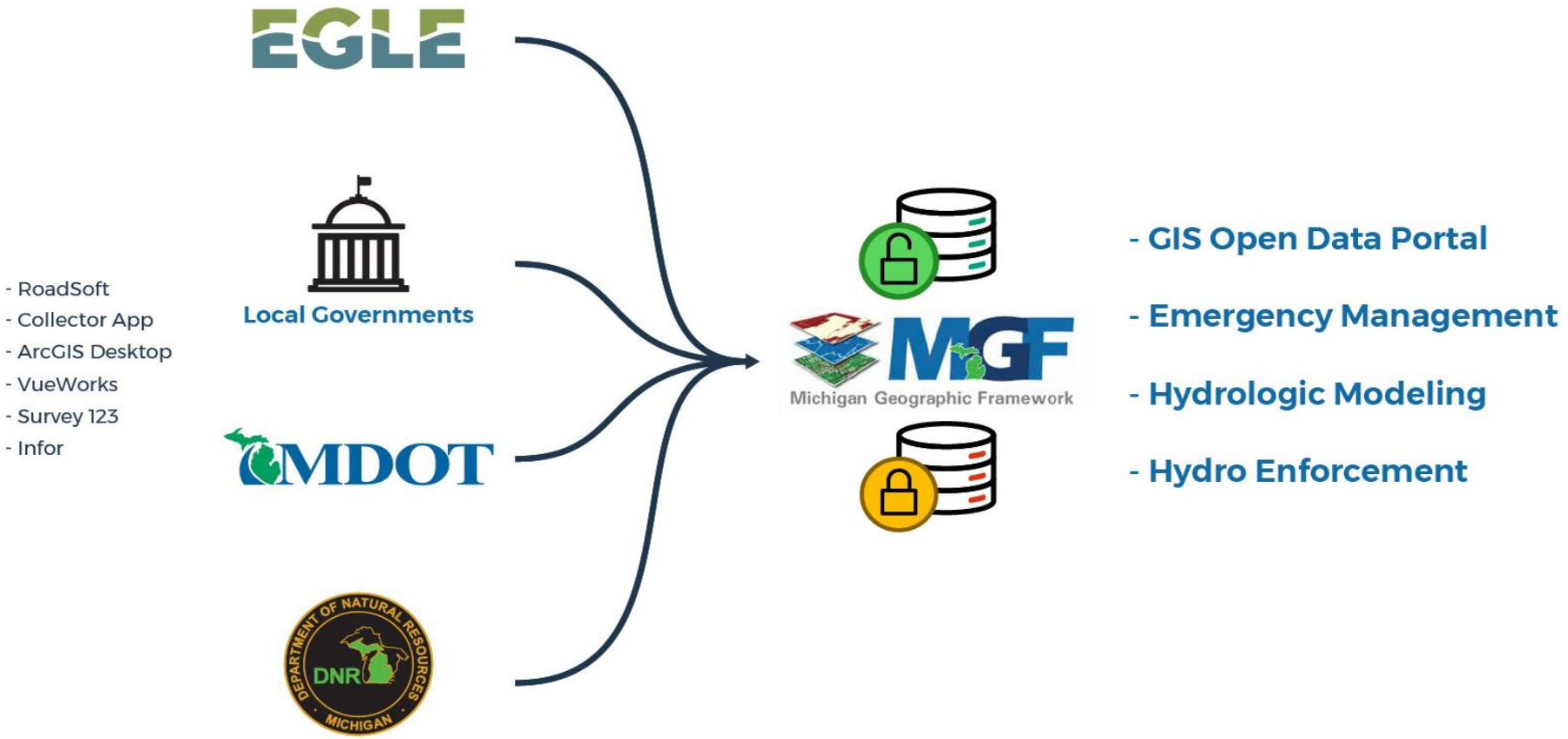
MDOT - Transportation Asset Management System (TAMS)

- Life cycle management of MDOT assets by combining location information with business intelligence
- Enterprise geodatabase infrastructure for business areas to store and manage data
  - Planning – Design – Construction – Operations – Maintenance
- Data published for stakeholders to perform analysis and make better informed decisions through suite of user-friendly web-based applications
  - Road Analyzer – Road Video Viewer – Validation Assistant – Segment Analyzer – Report Engine – Roadway Reporter
- Maintenance Management System (MMS) integration allowing real-time service and work order requests be communicated efficiently for staff and management to most effectively resolve
  - VueWorks

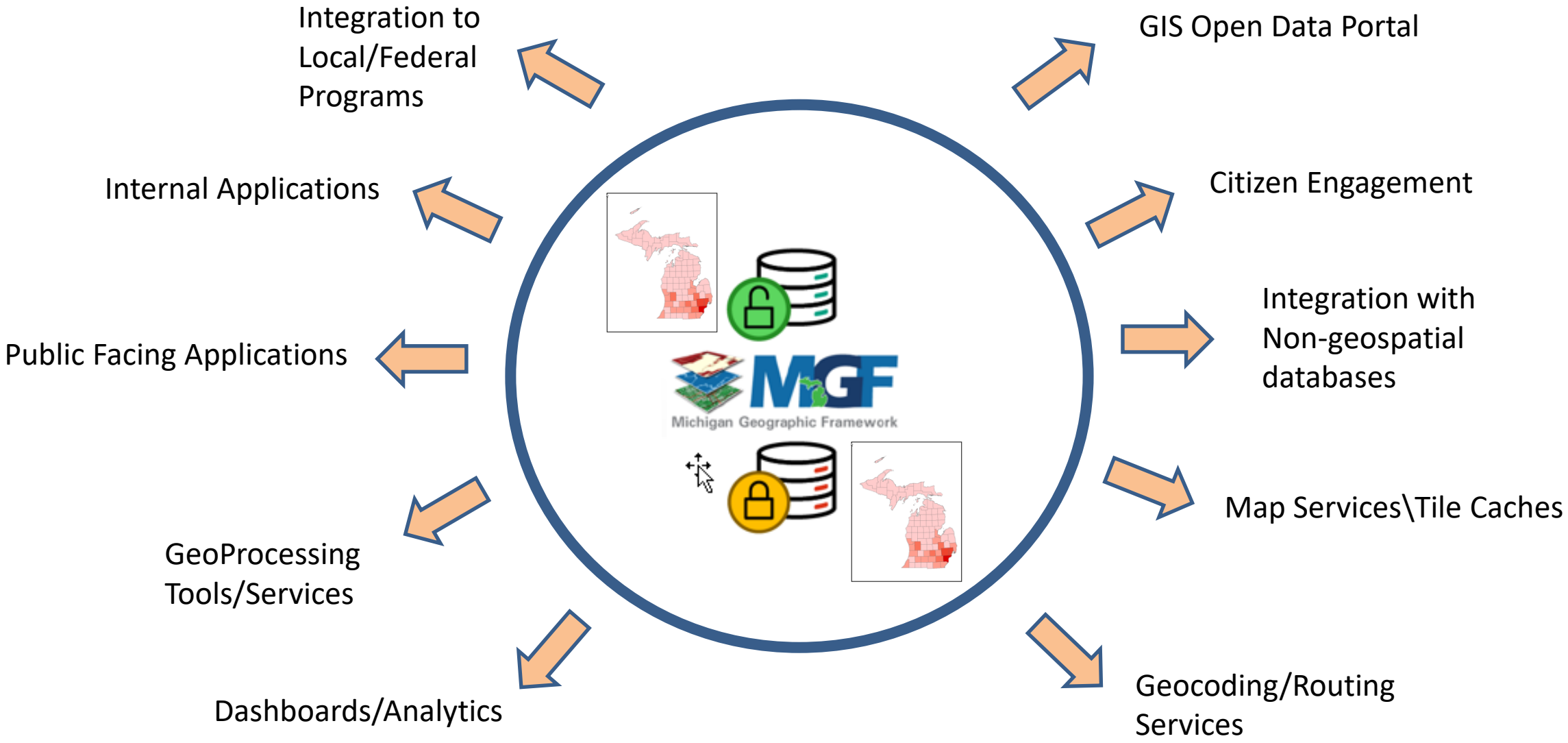
MDOT - Transportation Asset Management System (TAMS)

- Statewide Asset Collections
  - Culverts (2017-2019)
    - 2017-2018: ~35,000 collected in 69 counties
    - 2019: Grand Traverse, Leelanau, Wexford, Wayne, and 10 U.P. counties
    - ArcGIS Collector used with high-accuracy GPS
  - Guardrail and Cable Barriers (2017)
    - ~30,000 Guardrails & 680 Cable Barriers collected statewide
    - Photography with field identification spot checks
  - Future Assets
    - Bridge Mounted Signs & Structures
    - Cantilevers
    - Pump Stations
    - Signs
    - Trusses

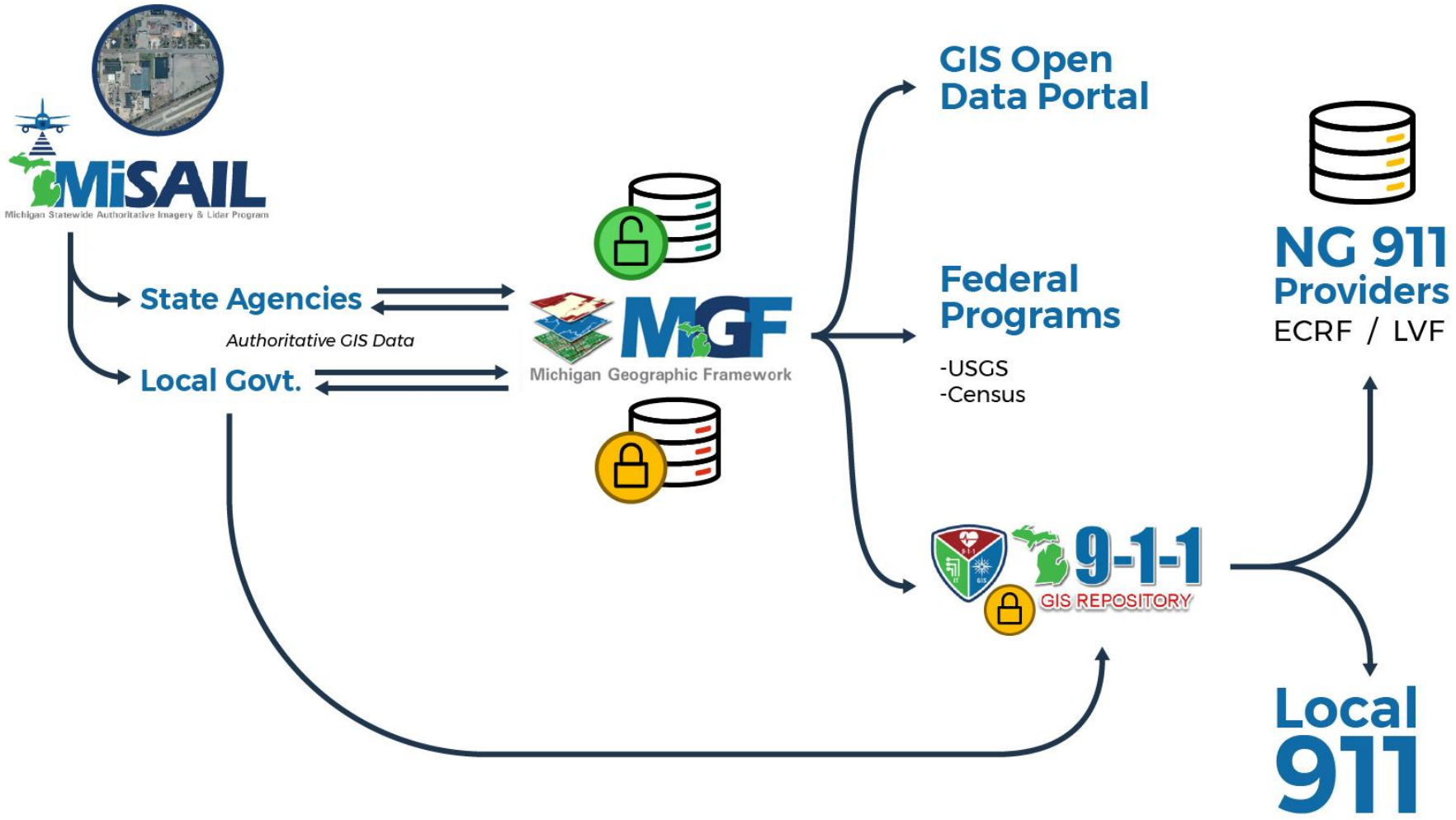
MGF Geospatial Data Hub Culverts Data Flow and Use Cases



Access to Geospatial Data Hub



GIS Coordination and Integration



Demo

Contributor Data Flow Conceptual Design

WMX Job Table

Job ID	Portal User ID	Created Date
1	user1	03/08/2018:12:00:00

Contribution Metadata Table

Contribution ID	Contributor ID	Source Layer ID	Job ID	Status	Source Location	Layer Path
1	100	2	1	New	\\MGF\Agency\user1\date\	\\..\Source location\centerline.shp

Operation Dashboard

Data Upload

Data Prep

Data Mapping

Data Validation

<25%

Change Detection

MGF Update

MGF Staging GDB

Replication

MGF Publication GDB

Options:
- No Attribute Mapping
- Attribute Mapping

1. FS

2. Zip

Accepted Upload

Errors

Errors

% of errors that determines the contribution is acceptable for further processes

Failure

Fail

Error free features will pass through and Errors will be rejected

The upload unacceptable and the workflow close and complete

Errors

Errors

MGF Validation

Successful Upload

Errored features will be available for CSS to edit and save in the MGF Staging GDB

Data REV

CSS Review

Manual

MGF Validation

Manual

Data REV

WMX Auto Execution

WMX Manual Execution

Mandatory Alert – Email Notification.

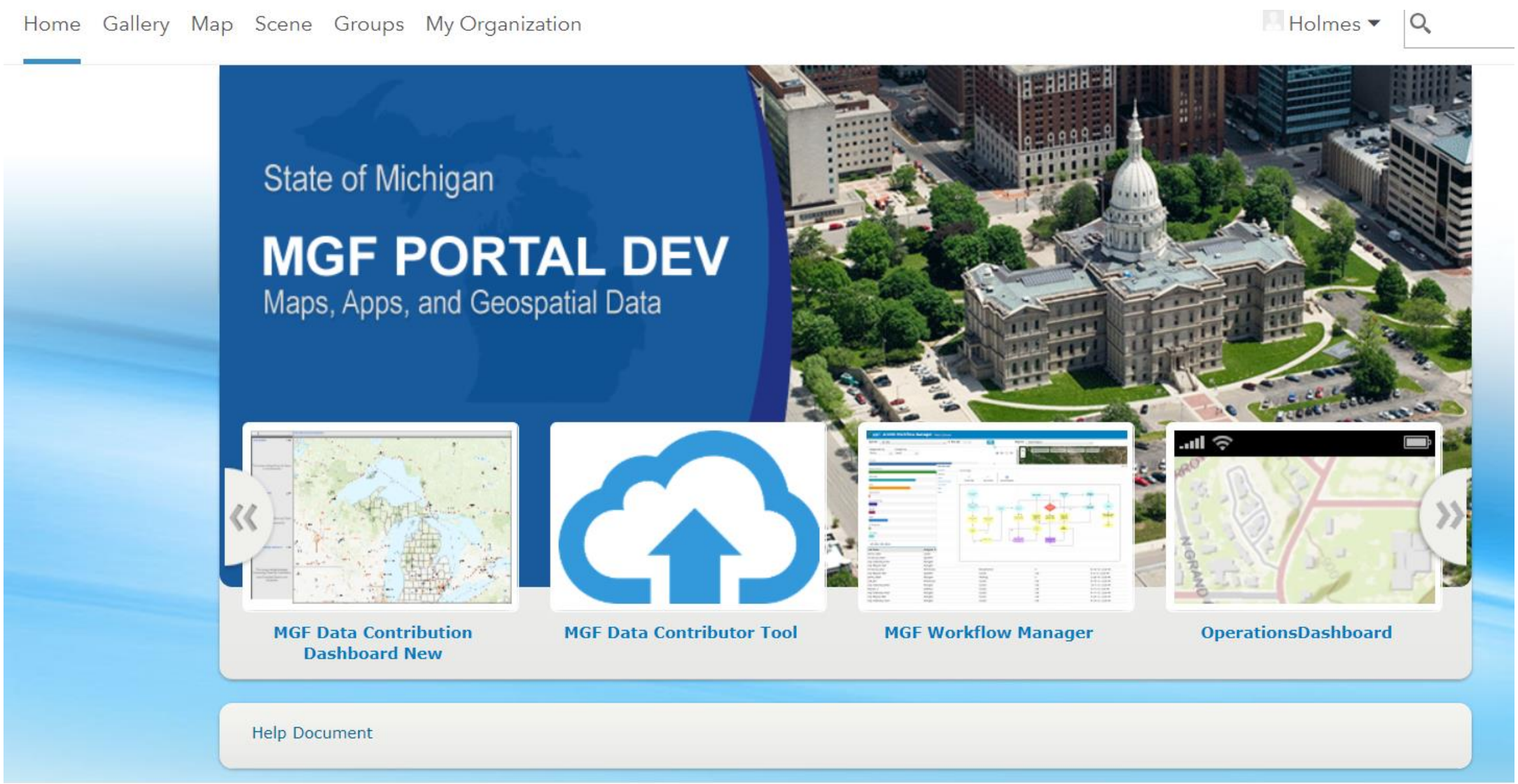
Notification Table

Notification ID	Contribution ID	Message text	Date
1	100	Received a new upload	03/08/2018: 12:00:00

esri

1spatial

MGF Portal Site



HELP. CONNECT. SOLVE.

MGF Contribution Dashboards