Transportation Asset Management Council

Fall 2023 Conference

Inventory and MIRE FDE

From the Michigan Department of Transportation
Data Inventory and Integration Division
Within the
Bureau of Transportation Planning

Presented by Mike Toth and Heather Hoeve

Asset Management

- Question: What could be a fundamental base needed for asset management?

A base for Asset Management

- One possible answer: An accessible roadway inventory that is maintained and can integrate data spatially.

A base for Asset Management is a GIS roadway file

- Michigan Geographic Framework (MGF) and Center for Shared Solutions (CSS)
- MDOT and Roads and Highways

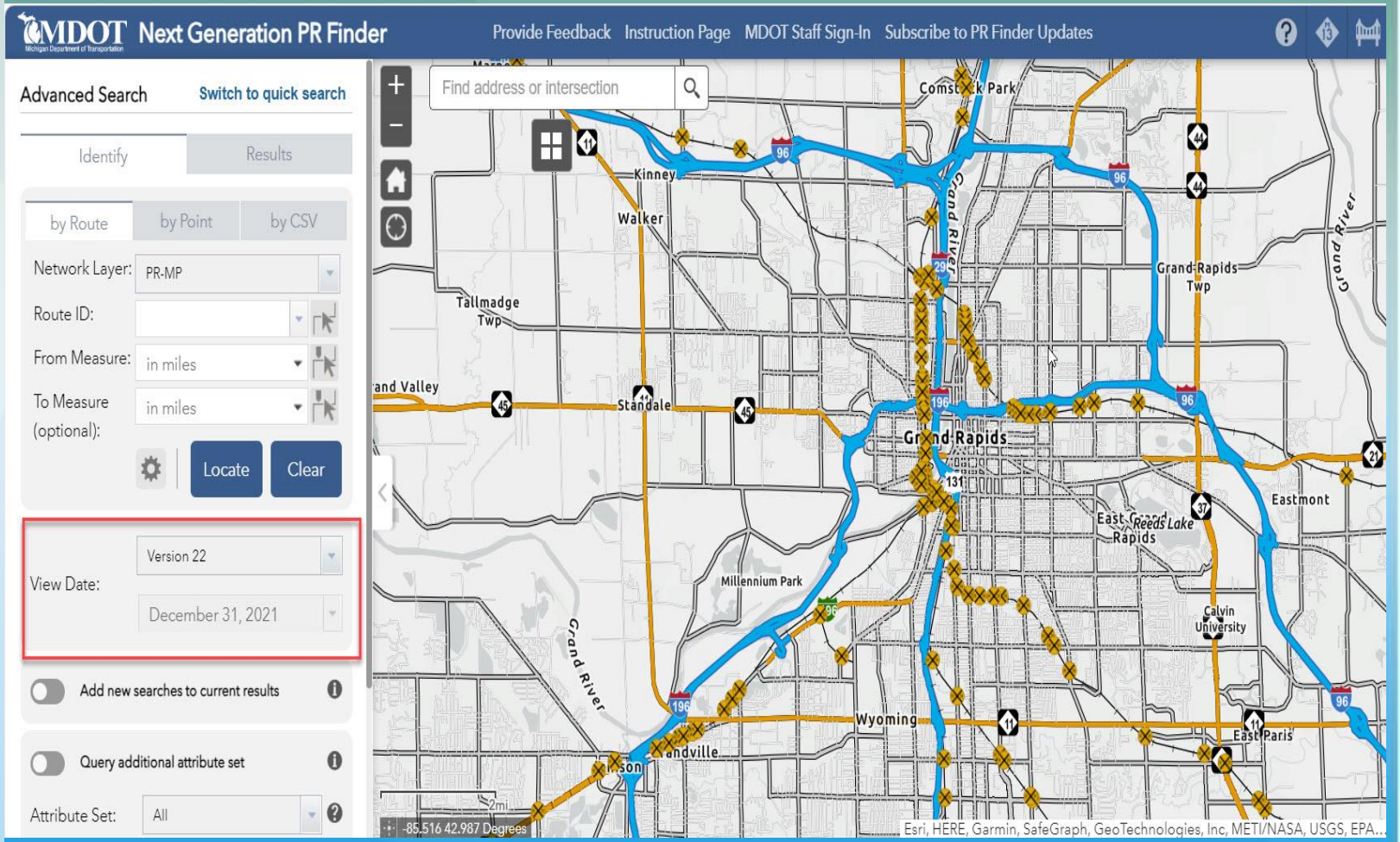
MDOT and Roads and Highways (RH)

- Advanced Linear Referencing System (ALRS)
  - MDOT GIS Unit
- RH event attributes and classifications
  - Act 51 of 1951 as amended
  - Statewide 2020 Census Urban Review
  - Highway Performance Monitoring System (HPMS), an annual federal report.
  - Model Inventory of Roadway Elements Fundamental Data Elements (MIRE FDE)
- Partners!
  - Vendors - CSS, MTU, ESRI
  - Transportation Agencies – TAMC, planning agencies, counties, cities, and villages.
- Tools
  - Roadsoft MIRE FDE
  - Roadsoft correction tool

A base for Asset Management is a GIS roadway file.

Advanced Linear Referencing System (ALRS)

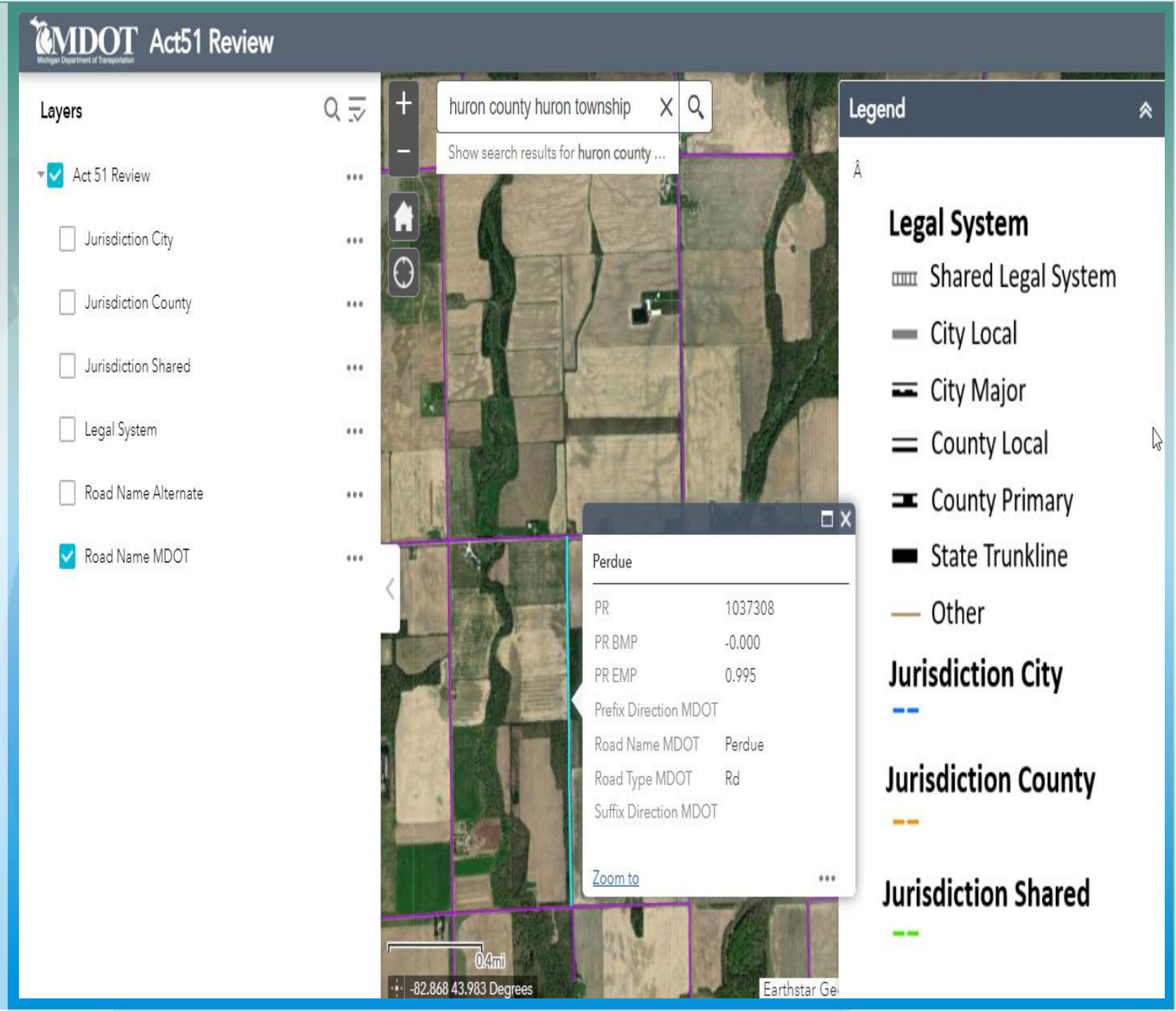
[Next Generation PR Finder (state.mi.us)]



A base for Asset Management is a GIS roadway file.

MDOT RH partners with

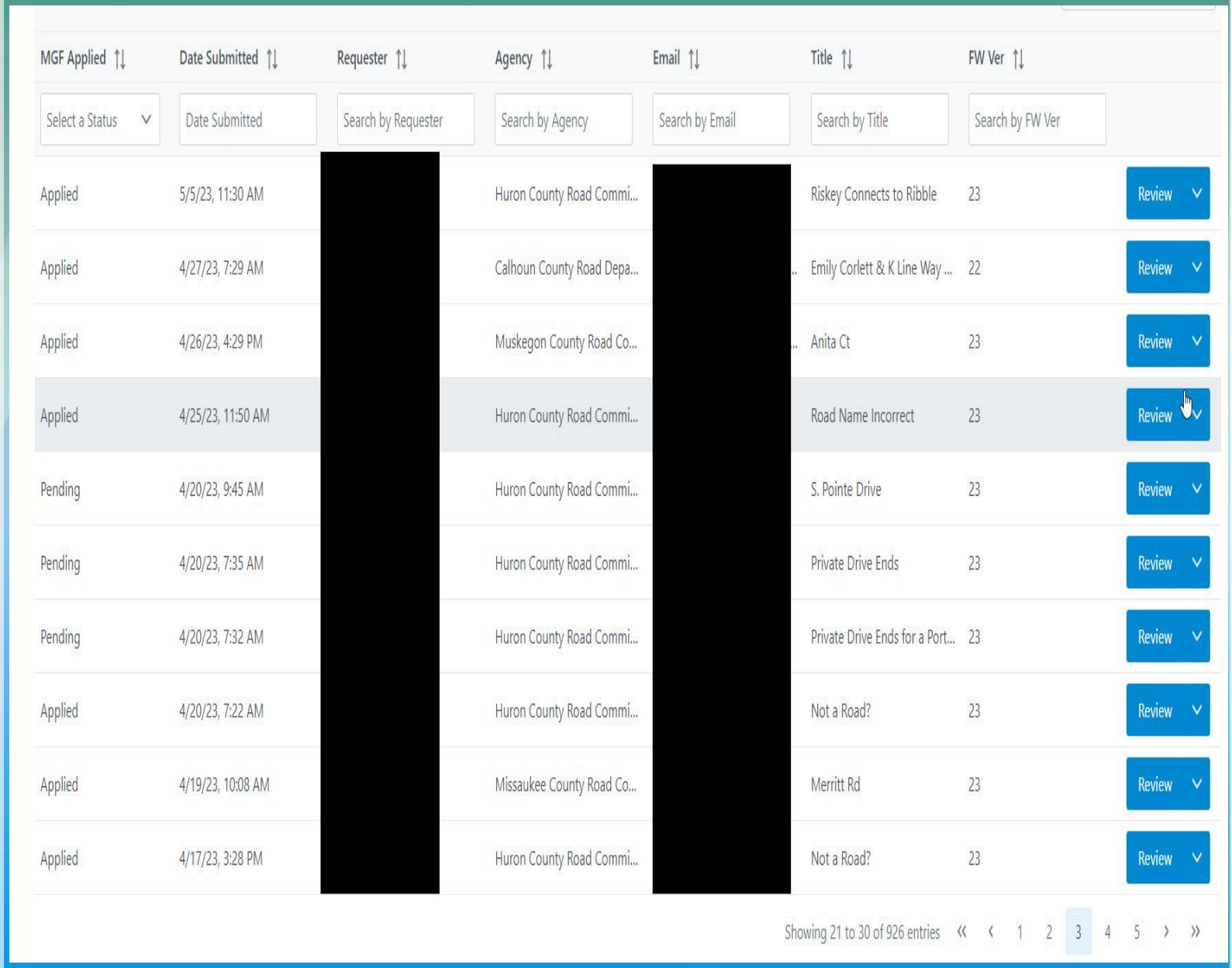
Act 51 of 1951 as Amended Annual Mileage Certifications



A base for Asset Management is a GIS roadway file.

MDOT RH partners with

Roadway Correction Request Tool in Roadsoft



MGF Applied	Date Submitted	Requester	Agency	Email	Title	FW Ver	
Select a Status	Date Submitted	Search by Requester	Search by Agency	Search by Email	Search by Title	Search by FW Ver	
Applied	5/5/23, 11:30 AM	[redacted]	Huron County Road Commi...	[redacted]	Riskey Connects to Ribble	23	Review
Applied	4/27/23, 7:29 AM		Calhoun County Road Depa...		Emily Corlett & K Line Way ...	22	Review
Applied	4/26/23, 4:29 PM		Muskegon County Road Co...		Anita Ct	23	Review
Applied	4/25/23, 11:50 AM		Huron County Road Commi...		Road Name Incorrect	23	Review
Pending	4/20/23, 9:45 AM		Huron County Road Commi...		S. Pointe Drive	23	Review
Pending	4/20/23, 7:35 AM		Huron County Road Commi...		Private Drive Ends	23	Review
Pending	4/20/23, 7:32 AM		Huron County Road Commi...		Private Drive Ends for a Port...	23	Review
Applied	4/20/23, 7:22 AM		Huron County Road Commi...		Not a Road?	23	Review
Applied	4/19/23, 10:08 AM		Missaukee County Road Co...		Merritt Rd	23	Review
Applied	4/17/23, 3:28 PM		Huron County Road Commi...		Not a Road?	23	Review

Showing 21 to 30 of 926 entries « ‹ 1 2 3 4 5 › »

Partners

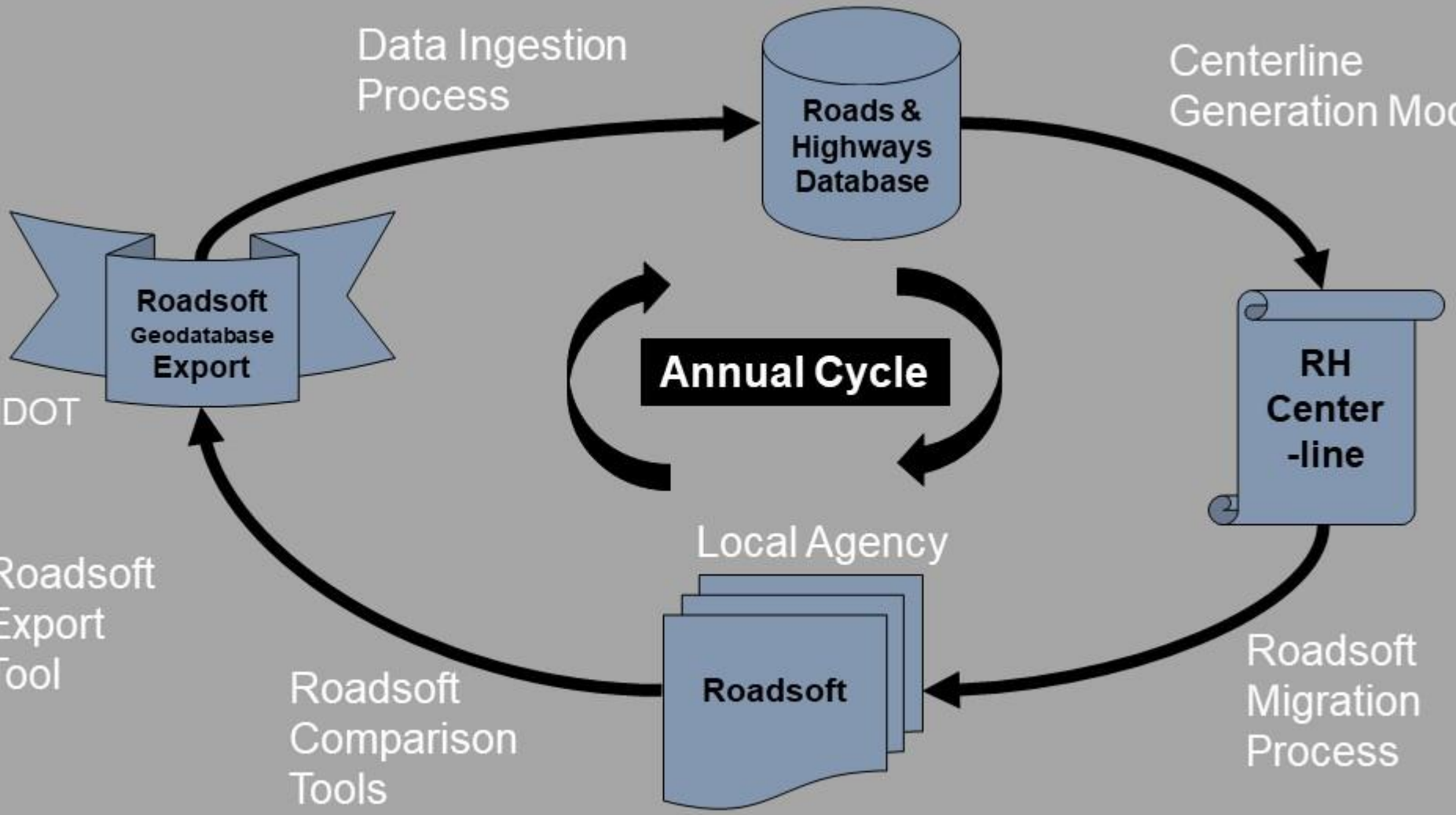
Listened and applied what we have heard from our partners and FHWA.

- MDOT and vendor collection of data.
- Share and have the MIRE FDE data accessible via Roadsoft
- NHTSA Grants administered through OHSP and approved by TRCC

Communication

- Unified Work Program
- Rural Transportation Planning Program
- Annual Cycle
- Local agency review, fill gaps and maintenance

MIRE FDE Data Cycle



Local Agencies should export and submit to MDOT by **November 1st**. The exports will be sent to MDOT through a cloud service directly within Roadsoft

Local Agencies will have access to the newest Roadsoft version and MIRE FDE Tools on **April 1st**

What is MIRE FDE?

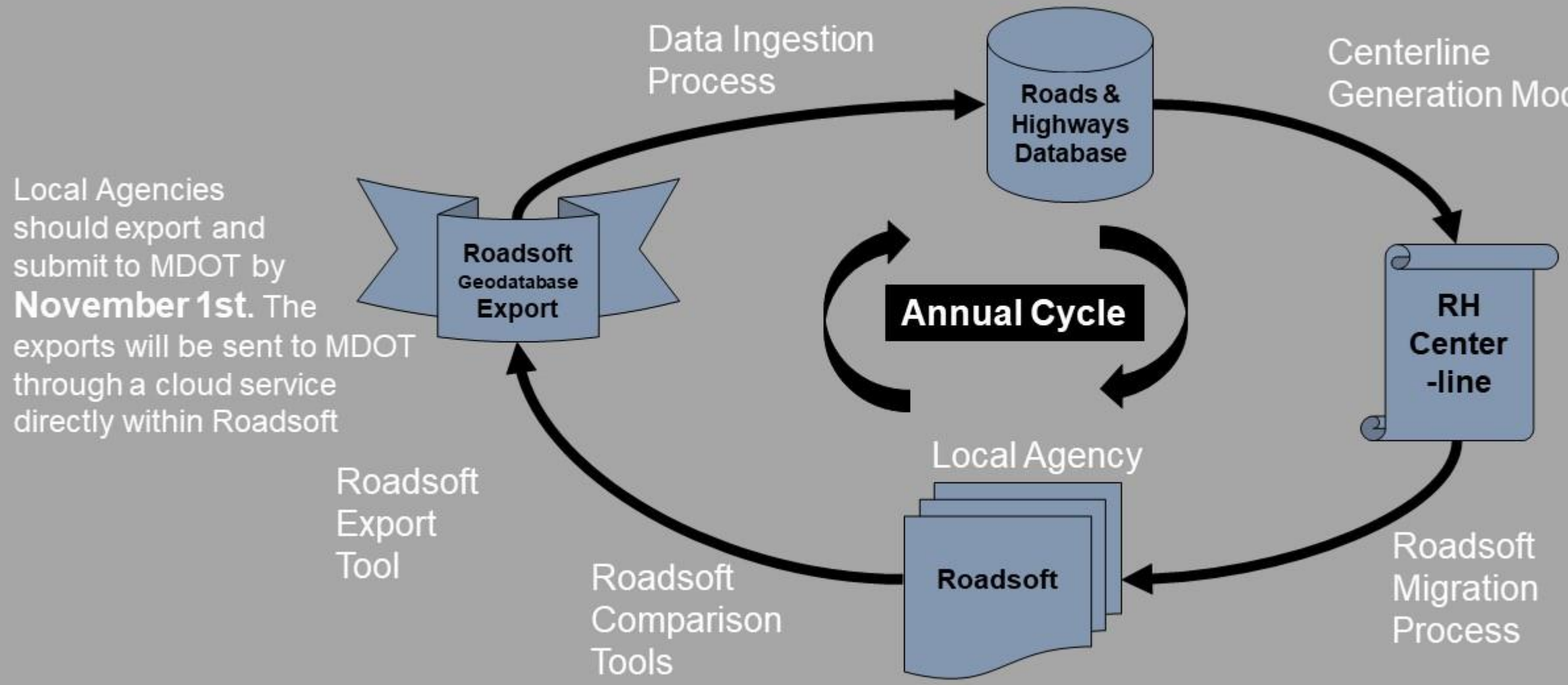
Heather Hoeve

MDOT Transportation Planner

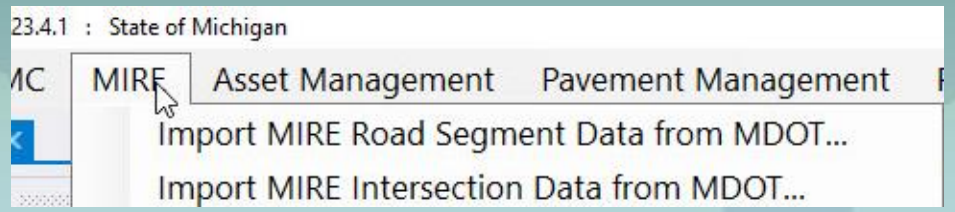
MIRE FDE Background

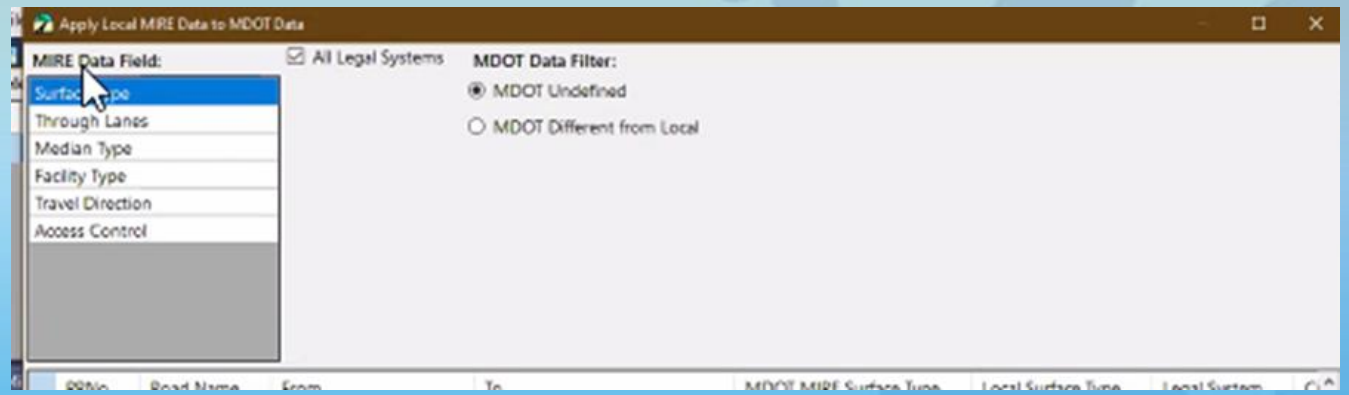
- Model Inventory Roadway Elements Fundamental Data Elements (MIRE FDE) establishes a collection of data which enhances agency's ability to make decisions on the safety performance of roadways.
  - Federal requirement for collection is in Title 23, Part 924
- Model Inventory of Roadway Elements (202)
- Fundamental Data Elements (38 of 202)
- MDOT will be initially populating all data items and is looking to the MPOs/RPAs/Act 51 Agencies to help maintain the data through the annual data cycle.
- Agencies are asked to review the following 6 data items within Roadsoft:
  - Intersection Traffic Control
  - Access Control
  - Through Lanes
  - Surface Type
  - Median Type
  - One/Two-Way Roads

MIRE FDE Data Cycle



Roadsoft Comparison and Export Tools for Local Agency Review





- 6 Data Items Agencies are asked to review to fill gaps and annually maintain once initially populated:
  - Intersection Traffic Control
  - Access Control
  - Through Lanes
  - Surface Type
  - Median Type
  - One/Two-Way Roads

MDOT Data Collection Projects

- **Median Type (All Non-Local Roads):** Center for Shared Solutions (CSS) is reviewing using imagery
- **Intersection Traffic Control (All intersections on Non-Local Roads):** For Trunkline roads we are mining data from other MDOT databases. We also have staff collecting using Google Streetview. For non-trunkline CSS is collecting using Google Streetview. We are also exploring the option of using AI and field collection for areas of trunkline and non-trunkline where Google Streetview is unavailable.
- **Surface Type (All Roads):** MTU is using AI and aerial imagery to derive data on all roads.
- **Access Control (All Non-Local Roads)**

Non-Local Roads refers to National Functional Classification roads 1-6

All Roads refers to all roads owned by a public agency.

Access Control

- A decision was made with MDOT Traffic and Safety that the partial access control definition requires a partial access control policy or program that defines partial access control.
  - While roads may exhibit characteristics of partial access control there must be a policy or program in place that defines and implements partial access control on that road.

22. Access Control

Definition: The degree of access control.

Attributes:

- Full access control – Preference given to through traffic movements by providing interchanges with selected public roads, and by prohibiting crossing at-grade and direct driveway connections (i.e., limited access to the facility).
- Partial access control - Preference given to through traffic movement. In addition to interchanges, there may be some crossings at-grade with public roads, but, direct private driveway connections have been minimized through the use of frontage roads or other local access restrictions. Control of curb cuts is not access control.
- No access control - No degree of access control exists (i.e., full access to the facility is permitted).

Local Outreach

- MDOT MIRE team has met with all MPOs and RPAs to discuss local agency involvement in the annual data cycle.
- In 2024 the MDOT MIRE team will be meeting with planning and Act 51 agencies.

MDOT MIRE Dashboard Experience Builder

Homepage | Data Item Dashboards | Local Agency Data Viewer | Data Item Guide

Model Inventory of Roadway Elements Fundamental Data Elements

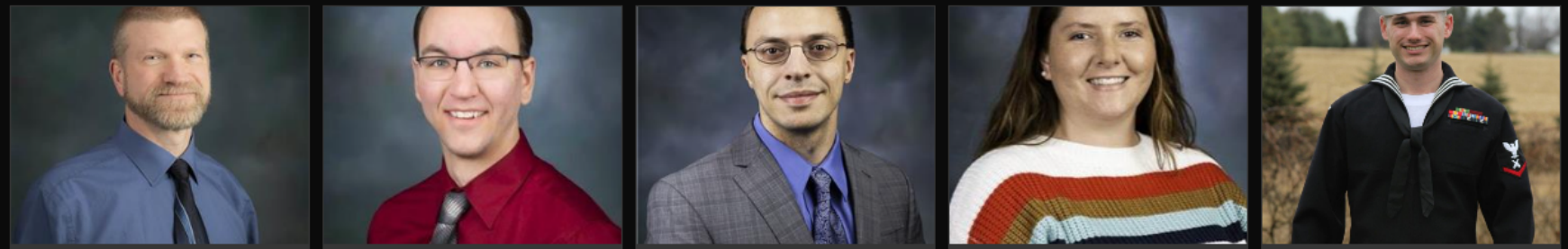
The federal FAST (Fixing America's Surface Transportation) Act established seven Transportation Performance Measures (TPM) for states to set targets and meet. Tied to the safety TPM, is Federal Register 13722. This register document lays out a safety data item collection requirement called the Model Inventory of Roadway Elements Fundamental Data Elements (MIRE FDE). The MIRE FDE is a set of data items that must be collected based upon the National Functional Classification (NFC) and surface type of all public roads in Michigan. This establishes a collection of data that supports Michigan's data-driven safety program.

There are 202 total MIRE data items, 38 of those are the required FDEs. The data item dashboards highlight each of the FDEs and the progress in collection. In addition to the data item specific dashboard there is a dashboard aimed at Metropolitan Planning Organizations (MPO), Regional Planning Agencies (RPA), and Local Agencies to help view and analyze data within their jurisdictional boundaries. This dashboard contains 6 data items, surface type, intersection traffic control, median type, access control, through lanes, and one/two-way roads. A Data Item Guide is available to assist regional and local agencies familiarize themselves with the 6 data items. The definitions and domains are provided as well as examples of the domain values.

MIRE FDE Resources

MIRE Roadsoft Training	MDOT MIRE Roadsoft Round-up	FHWA MIRE 2.0

MDOT MIRE FDE Staff



120,512 miles
of Ownership
on 120,512 miles of public roads.

100%

Total Ownership Coverage

111,286 miles
of AADT
on 111,419 miles of paved roads

Total Average Annual Daily Traffic (AADT) coverage

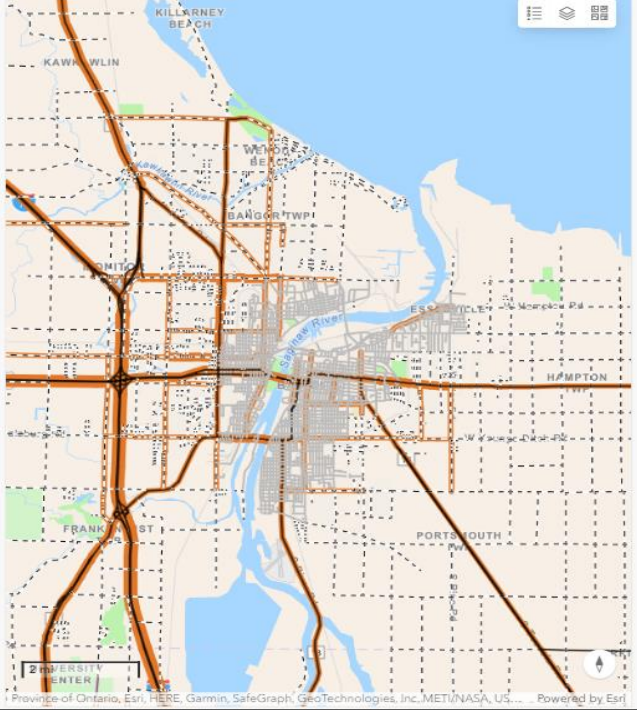
99.88%

Non Local AADT Coverage

99.74%

Local Road AADT Coverage

99.96%



38,404 miles
of Access Control
on 38,404 miles of non Local paved roads

100%

State Owned Non Local Access Control Coverage

Total Access Control Coverage

100%

Non State Owned Non Local Access Control Coverage

100%

6,560 miles
of Median Type
on 38,404 miles of non Local paved roads

State Owned Non Local Median Type Coverage

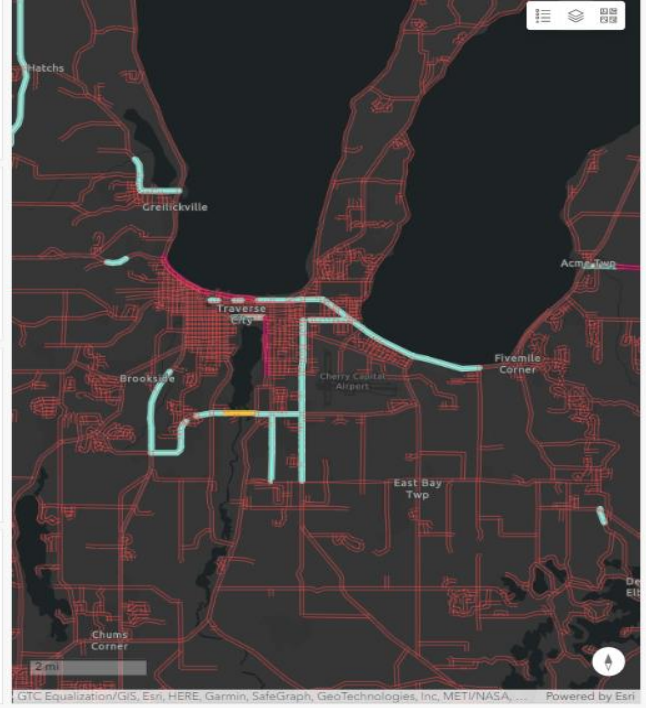
39.96%

Total Median Type Coverage

17.08%

Non State Owned Non Local Median Type Coverage

9.46%



120,512 miles
of Functional System
on 120,512 miles of public roads.

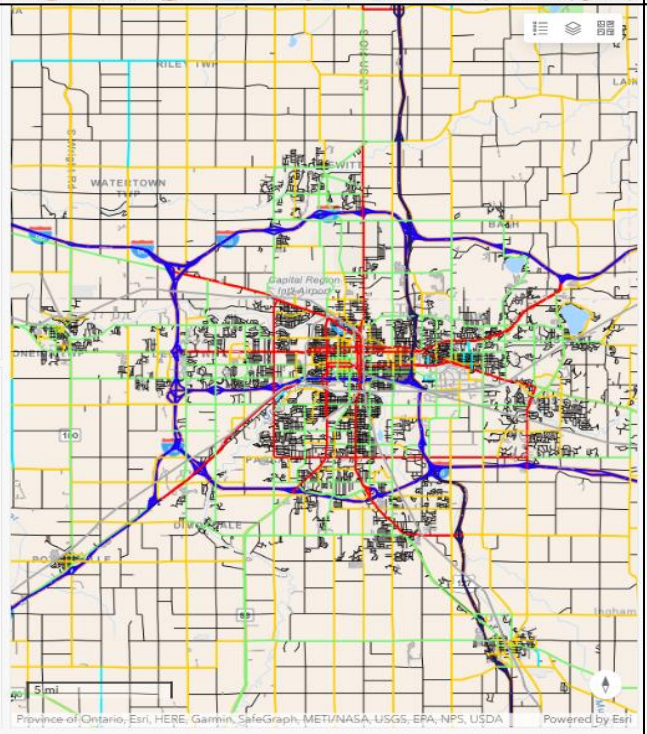
Total Functional System Coverage

100%

38,404 miles
of Route Type (NHS)
on 38,404 miles of non-Local paved roads.

Total Route Type (NHS) Coverage

100%



135,376 Junction IDs
822 Interchange IDs
184 Roundabout IDs

Location Identifier for Road 1 Crossing Point Coverage

100%

Location Identifier for Road 2 Crossing Point Coverage

100%

Ramp Terminal Start Road Type Coverage

84.58%

Ramp Terminal End Road Type Coverage

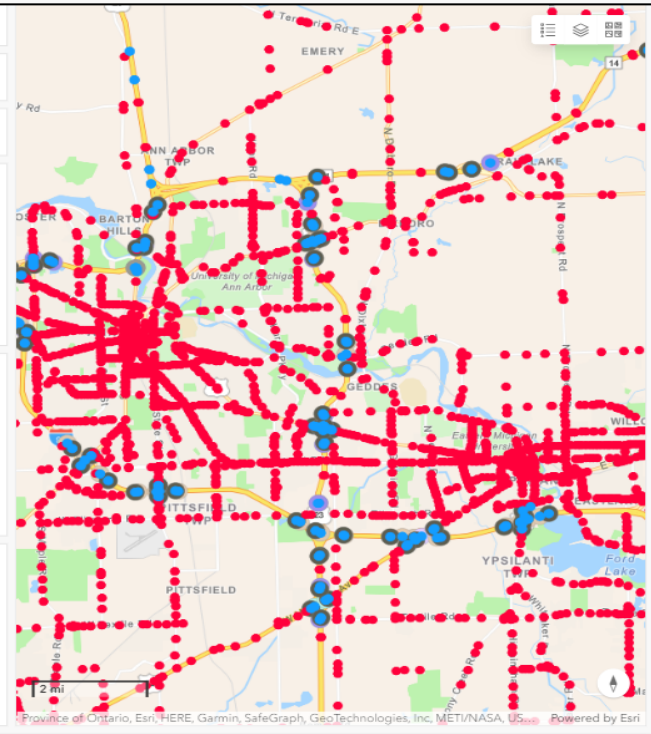
84.43%

Location Identifier for Ramp Terminal Start Coverage

100%

Location Identifier for Ramp Terminal End Coverage

100%



Local Agency Data Viewer

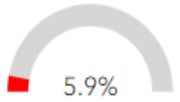
Local Agency Data Viewer

RPA Filter: Click to Drop-down Options | MPO Filter: Click to Drop-down Options | County Filter: Click to Drop-down Options | City Filter: Click to Drop-down Options

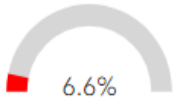
Total TRAFFIC CONTROL Coverage

9,204 / 136,198

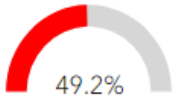
County Owned TRAFFIC CONTROL Coverage



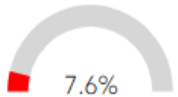
City Owned TRAFFIC CONTROL Coverage



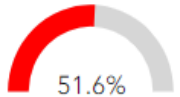
County Owned SURFACE TYPE Coverage



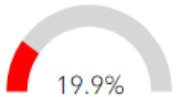
County Owned MEDIAN TYPE Coverage



City Owned SURFACE TYPE Coverage



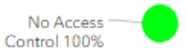
City Owned MEDIAN TYPE Coverage



County Owned ACCESS CONTROL Coverage

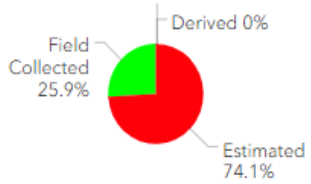
No Access Control — 24,424 miles

City Owned ACCESS CONTROL Coverage



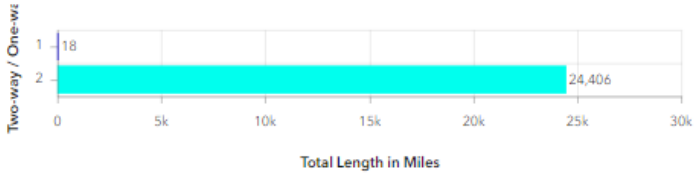
No Access Control — 4,370 miles

County Owned THROUGH LANES Coverage

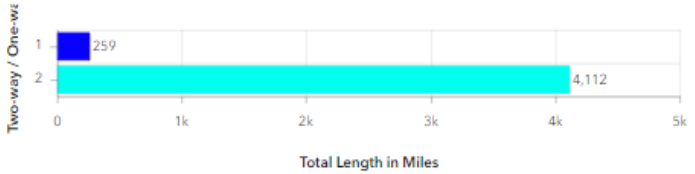


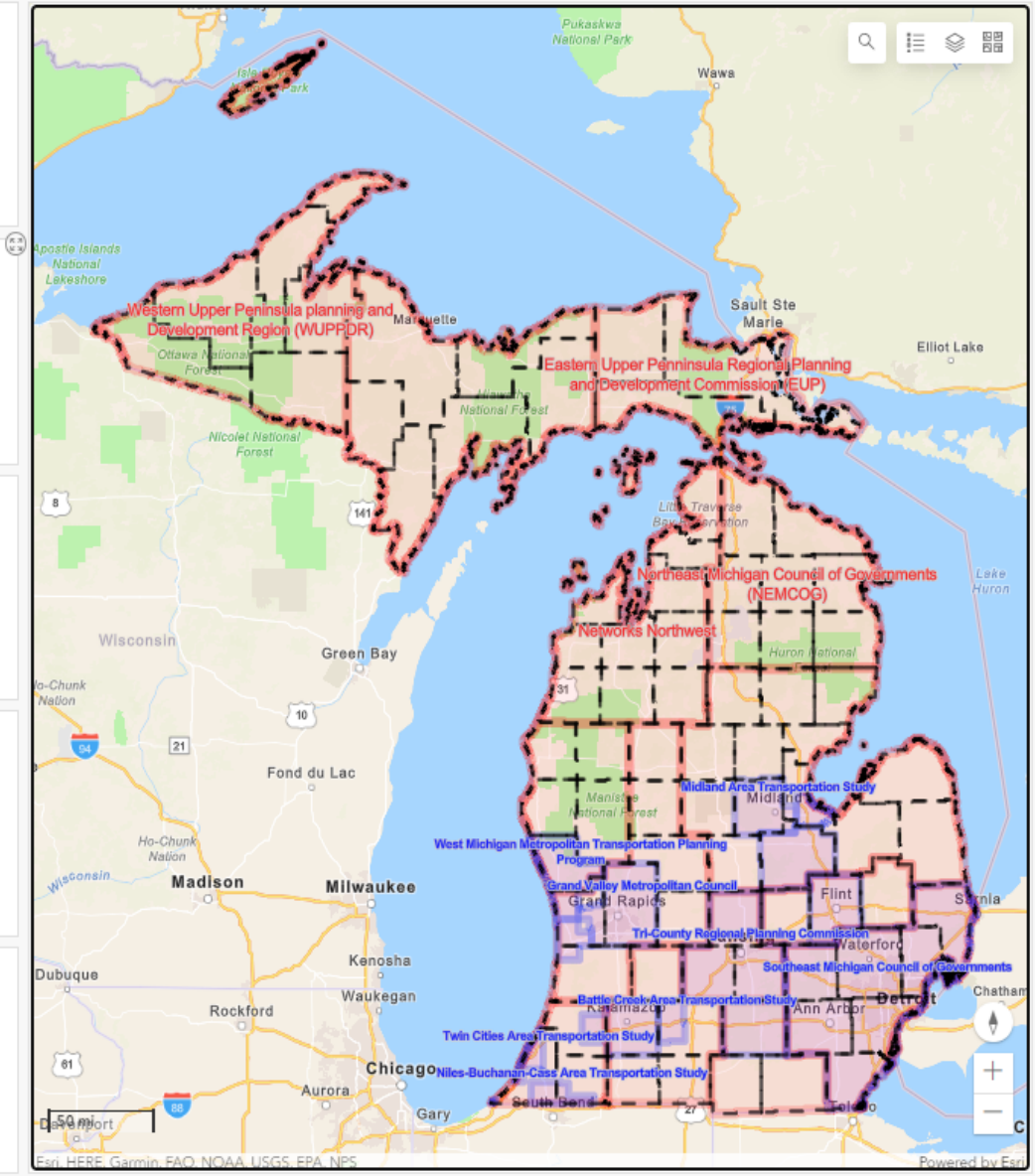
City Owned THROUGH LANES Coverage

County Owned FACILITY TYPE Coverage



City Owned FACILITY TYPE Coverage





Local Agency Data Viewer

Local Agency Data Viewer

RPA Filter: Click to Drop-down Options
MPO Filter: Click to Drop-down Options
County Filter: Click to Drop-down Options
City Filter: Grand Rapids

Total TRAFFIC CONTROL Coverage
86 / 2,172

County Owned TRAFFIC CONTROL Coverage
5.9%

City Owned TRAFFIC CONTROL Coverage
3.9%

County Owned SURFACE TYPE Coverage
96.8%

County Owned MEDIAN TYPE Coverage
0.6%

City Owned SURFACE TYPE Coverage
98.8%

City Owned MEDIAN TYPE Coverage
16.4%

County Owned ACCESS CONTROL Coverage

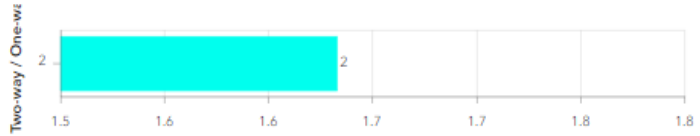
No Access Control — 2 miles

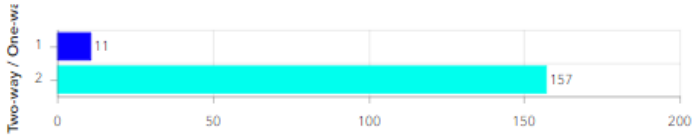
City Owned ACCESS CONTROL Coverage

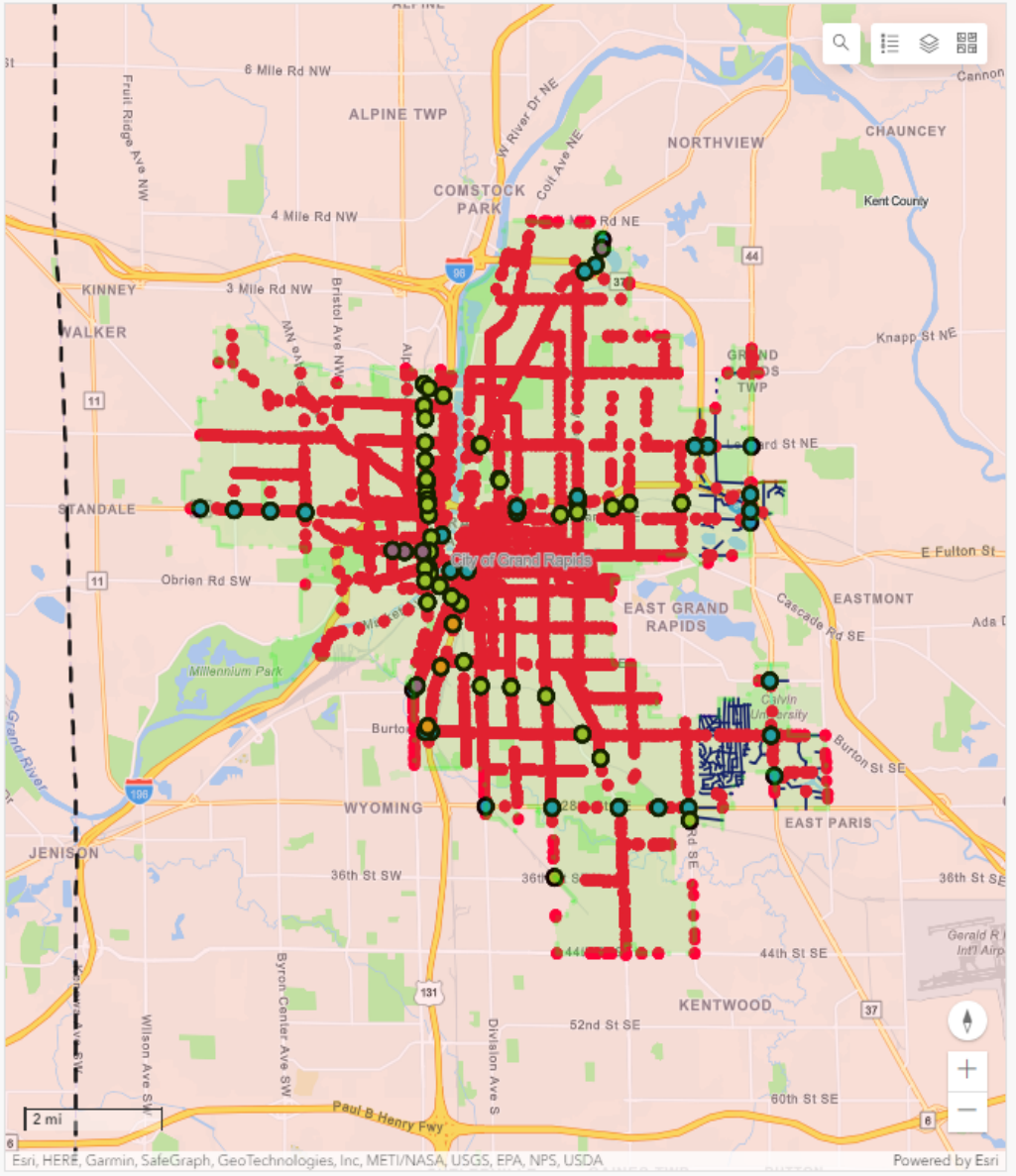
No Access Control — 164 miles

County Owned THROUGH LANES Coverage

City Owned THROUGH LANES Coverage

County Owned FACILITY TYPE Coverage


City Owned FACILITY TYPE Coverage




Data Item Guide

Data Item	Definition	Domain
Access Control	The degree of access control.	Full Access Control Partial Access Control No Access Control
One/Two-Way Roads	Indication of whether the segment operates as a one- or two-way roadway.	One-Way Two-Way
Surface Type	The surface type of the segment.	Unpaved Bituminous JPCP – Jointed Plain Concrete Pavement JRCP – Jointed Reinforced Concrete Pavement CRCP – Continuously Reinforced Concrete Pavement Asphalt-Concrete (AC) Overlay over Existing AC Pavement AC Overlay over Existing Jointed Concrete Pavement AC (Bituminous Overlay over Existing CRCP)

Data Item Guide

Data Item	Definition	Domain
Access Control	The degree of access control.	Full Access Control Partial Access Control No Access Control
One/Two-Way Roads		One-Way Two-Way
Surface Type	The surface type of the segment.	Unpaved Bituminous JPCP – Jointed Plain Concrete Pavement JRCP – Jointed Reinforced Concrete Pavement CRCP – Continuously Reinforced Concrete Pavement Asphalt-Concrete (AC) Overlay over Existing AC Pavement AC Overlay over Existing Jointed Concrete Pavement AC (Bituminous Overlay over Existing CRCP)

Two-Way Roadway

The road operates in two directions

Surface Type

- MIRE FDE requires that surface type be collected on all public roads.
- Prior to the MIRE FDE effort the challenge was to collect 65,000 miles of roads surface type administered by over 600 local transportation agencies.
- Surface type was estimated to have the highest collection effort. A decision was made to hire a vendor.

Surface Type Collection Pilot Projects

Three pilot efforts to collect Surface Type were tested

- CSS outreach to local agencies for surface type to enter into Roads and Highways.
- ESRI AI tool for MDOT Staff to derive surface type from aerial imagery.
- MTU was asked if they could do their Brooks 2017 Surface Type project to analyze aerial imagery to derive surface type for the entire state.

We choose one of the above methods to continue.

MDOT MIRE Team Contact Information

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