

# Transportation Asset Management: Tools, Reporting Requirements & Good Planning

**IMAGIN Conference 2019**

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Michigan Department of Transportation



# Session Agenda

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1. Overview of Transportation Asset Management Council & Industry Partners
2. Legislative Requirements
3. Standardization of Inventory, Condition Assessment of Transportation Assets – A Common Geography
4. Technological Tools & Reporting Resources
5. Significant Results
6. Future TAMC Developments
7. Q & A

# What is TAMC & Why is it Important?

- Michigan – A Home Rule State
  - 83 Counties
  - 533 Cities and Villages
  - 1,240 Townships
  - MDOT
  - 14 Planning Regions
  - 15 Metro Planning Agencies
  - Consultants & Contractors
- 122,000+ miles of public roads
- 11,000+ public bridges







# Asset Management Mandated by Law

- ✓ Statewide Asset Management Reporting that Includes:
  - ✓ Current: Roads & Bridges
  - ✓ Future: Culverts & Signals
- ✓ Annual Report Due May 2
- ✓ Coordinated Training & Data Collection with Regional Planning Partners
- ✓ Investment Reporting in Act 51

*Annual TAMC Work Program  
& \$2 Million Annual Budget*



*PA 499 of 2002 and other Act 51  
Amendments; PA 325 of 2018*

# Common Geography – Data Foundation

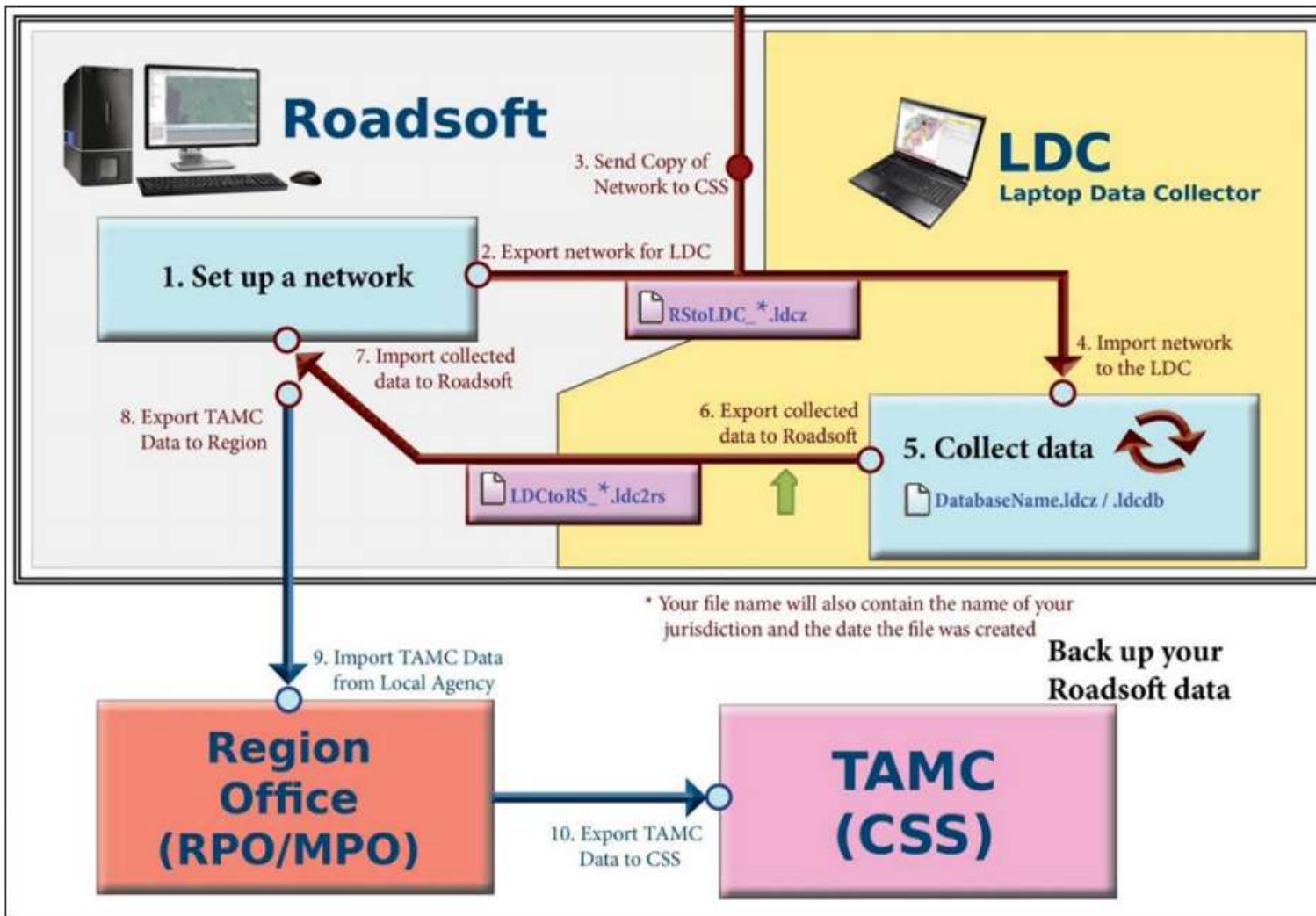
## Michigan Geographic Framework – Road Centerline

- PASER Data Collected with Roadsoft Tools
- Michigan Framework Basis for Roadsoft Pavement & Asset Management System
- Data Collection Teams Add Attributes to Centerline Layer
  - Number of Lanes
  - Surface Types
  - Condition
  - Field Notes for Data Maintenance

*PASER Data Collection Team*



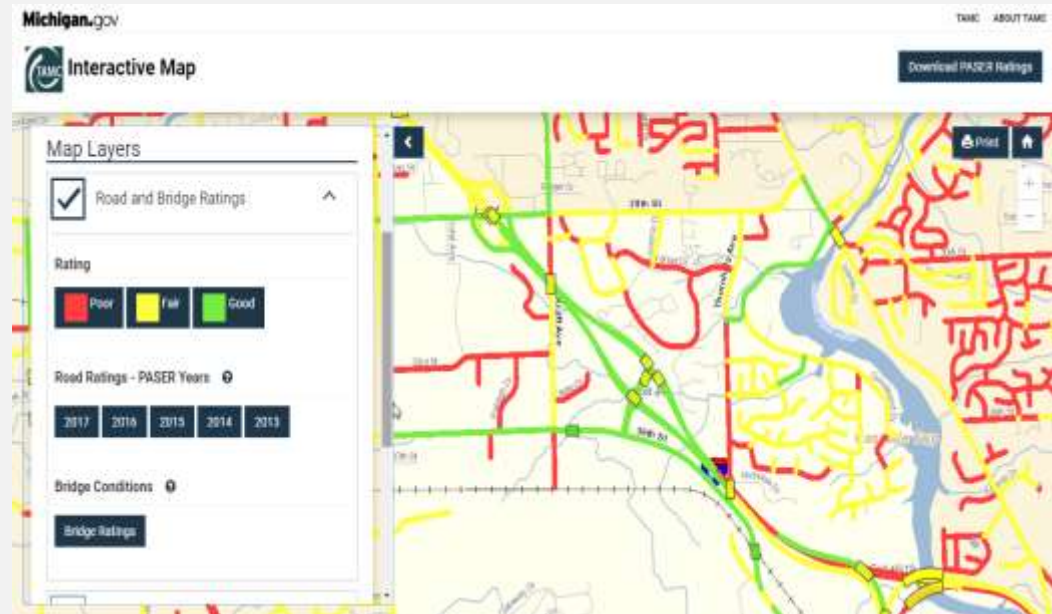
# Common Geography – Data Foundation



# Common Geography – Data Foundation

## Michigan Geographic Framework – Road Centerline

- Data Collected Once – Shared Multiple Times
- Local Ownership of PASER Data – Teams use Local Roadsoft
- Regionalized Reporting by Regional-Metro Planning Agencies
- Statewide Reporting
  - TAMC Annual Report
  - TAMC Interactive Maps
  - TAMC Dashboards

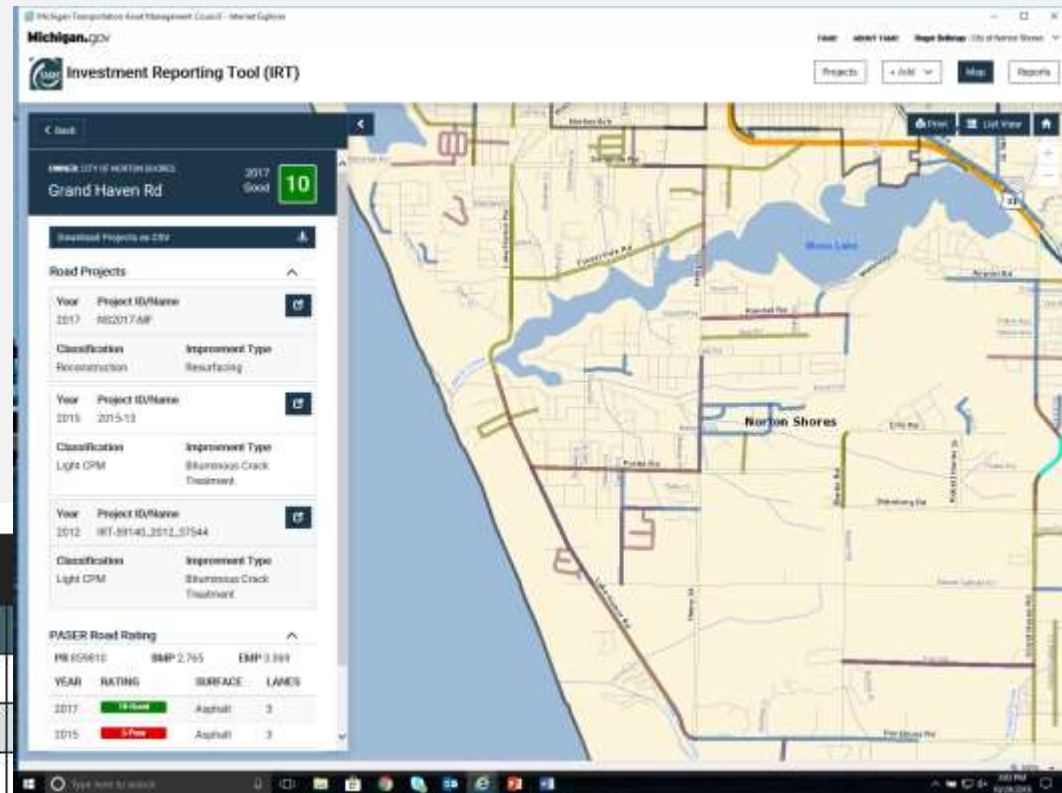




# Common Geography – Data Foundation

## Michigan Geographic Framework – Road Centerline

- Other Data Applications Built on Framework Centerline
  - Investment Reporting System
  - Annual Data Submittal of Road/Bridge Improvement Projects
  - Can Use Roadsoft or TAMC Investment Reporting Tool (IRT)



2016 Road Projects Details

Type of Projects	Count	Cost	
Light CPM	613	\$36,097,856	
Heavy CPM	1940	\$269,179,076	
Rehabilitation	1410	\$446,812,298	
Reconstruction	597	\$702,797,690	1058
<b>Total Number of Road Projects:</b>	<b>4560</b>	<b>\$1,454,886,920</b>	<b>12043</b>

# Common Geography – Utilization

Investment Reporting: From Common Geography of Framework Centerline to Legislative Mandate

**2016 Road Projects Details**

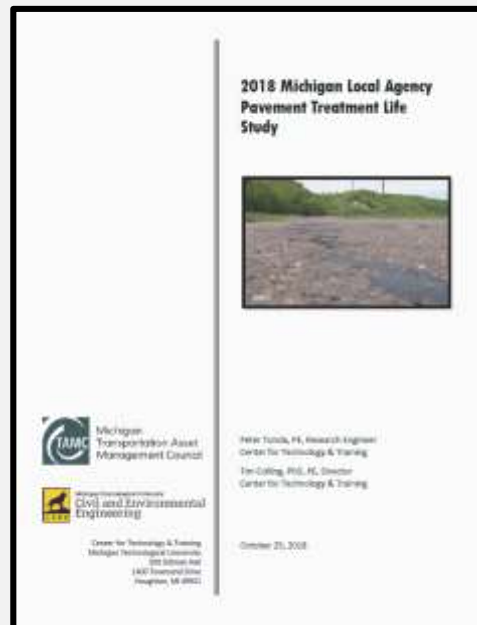
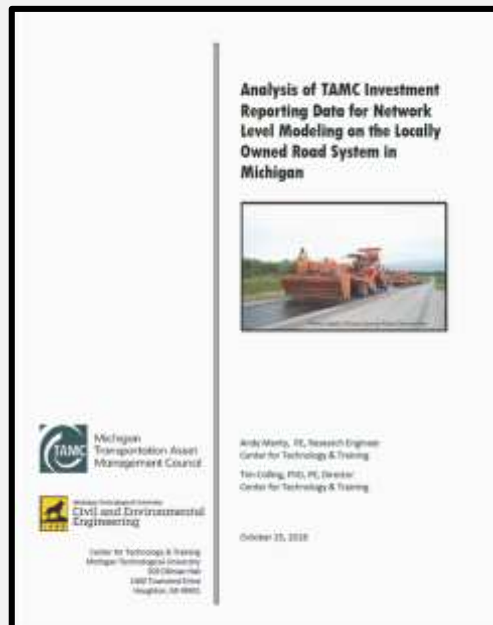
Type of Projects	Count	Cost	Lane Miles
Light CPM			
Heavy CPM			
Rehabilitation			
Reconstruction			
<b>Total Number of Road Projects</b>			

**2017 Road Projects Details**

Type of Projects	Count	Cost	Lane Miles
Light CPM	994	\$46,620,855	4,891
Heavy CPM	1,690	\$274,014,963	7,402
Rehabilitation	1,355	\$331,849,682	3,004
Reconstruction	642	\$408,458,923	1,234
<b>Total Number of Road Projects:</b>	<b>4,681</b>	<b>\$1,060,944,424</b>	<b>16,531</b>

# Common Geography – Utilization

## Investment Reporting: From Common Geography of Framework Centerline to Legislative Mandate ...To Advanced Learning - 2018 “A Year of Studies”



# Analysis of IRT Data For Modeling

## Objectives:

- Determine inputs for Pavement Condition Forecast System
- Average unit costs in 4 categories
- Volume of projects done each year
- Provide local agencies with cost data on a variety of treatments
- Account for unreported or errors
- Recommendations



# Analysis of IRT Data For Modeling

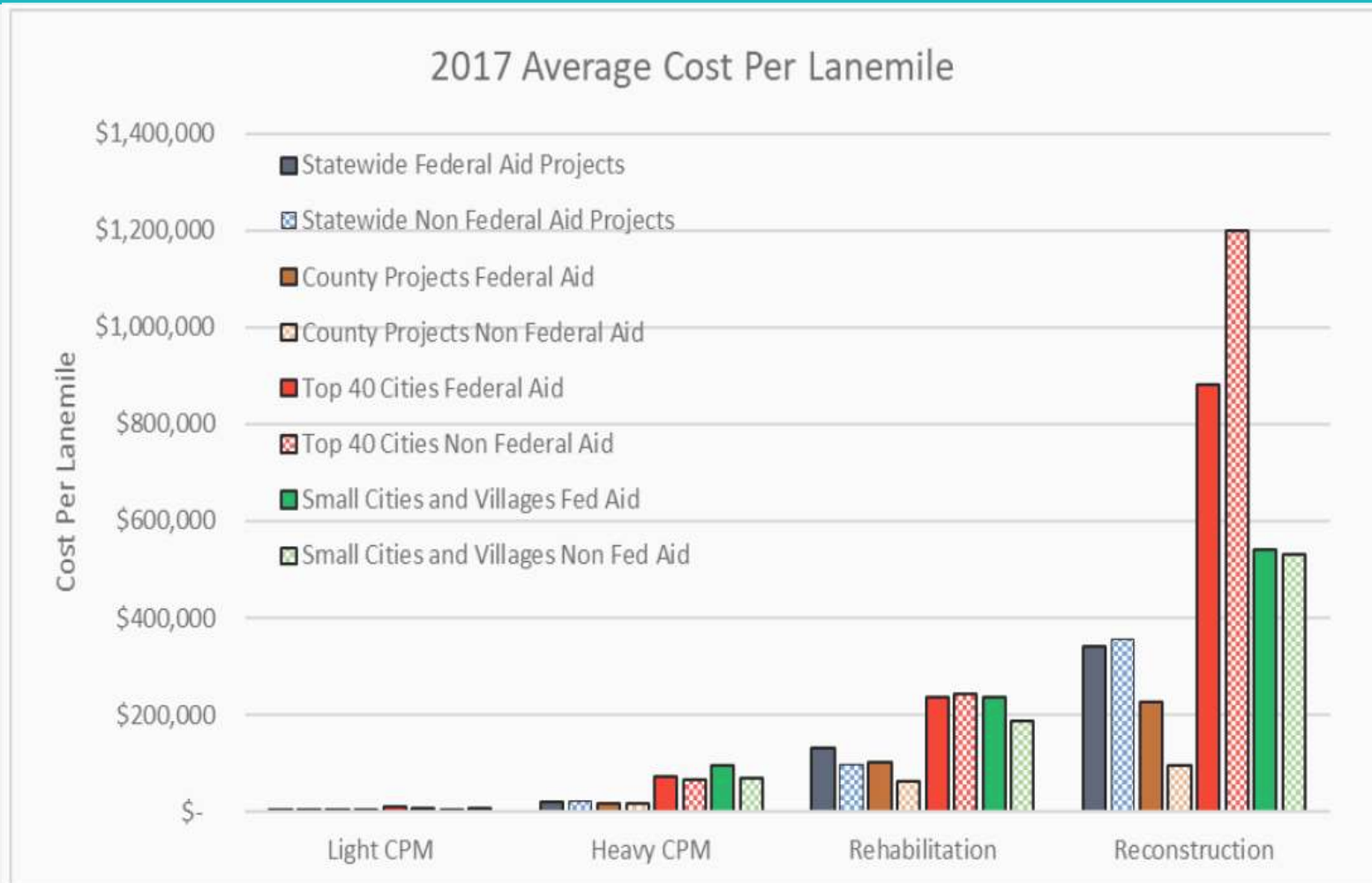


Figure 3: 2017 Weighted average project cost per lane mile data from IRT/ADARS system

# Analysis of IRT Data For Modeling

## Key Findings:

- TAMC's IRT is good source for data
- Costs for Common Treatments
- Counties had lowest cost per lane mile
- Large Cities had highest cost per lane mile
- Federal Aid projects typically cost more, except light CPM projects
- Repeat study every 2 years

*Full Report Available on TAMC Website*

# Pavement Treatment Life Study

## Objectives:

- Determine average Extended Service Life for modeling at State & Local level
- Show that Local Agencies have the Tools to replicate the Study
- Make minor improvements to the Tools

# Pavement Treatment Life Study

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## Key Findings:

- Local Agencies are collecting High Quality Data
- Study looked at worst case analysis for Extended Service Life
- Local Agencies gain significant benefit with treatments
- Local Agencies have the Data to Perform Study Locally

*Full Report Available on TAMC Website*



# Common Geography – Data Foundation

## Michigan Geographic Framework – Other Layers

- PASER Provides a Proof-of-Concept for Data Collection & Sharing
- Future Asset Classes of Culverts, Signals & other Transportation Data
- 2018 TAMC Culvert Mapping Pilot Project
- TAMC Concept Behind Development of Michigan Infrastructure Council and Water Asset Management Council
- Success of TAMC and other State/Regional Asset Management Initiatives built on Common Geographic Foundation and Data Models



*Culvert Data Collection 2018*

# 2018 Culvert Mapping Pilot

- \$2 million Supplemental Appropriation
- 49 local agencies participated
  - ✓ 32 counties
  - ✓ 12 cities
  - ✓ 5 villages
  - ✓ Mix of large/small/urban/rural
- 49,664 culverts inventoried
- Pilot Work Program:
  - Recommend Tools & Procedures
  - Webinar Trainings
  - Data Collection & Analysis



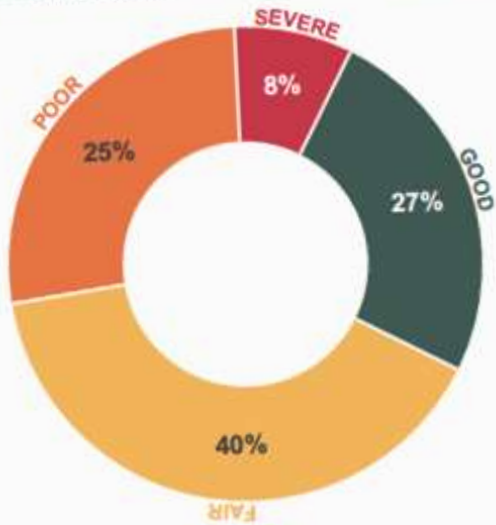
# 2018 Culvert Mapping Pilot

## Key Findings:

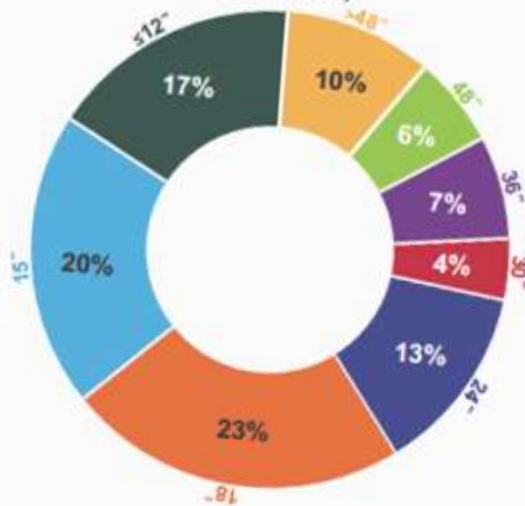
- Statewide estimate of local agency culverts: 196,000
  - 27% of culverts are in good condition
  - 69% of culverts are corrugated steel pipe
- Estimated time to inventory 1 culvert: 17 minutes
- Est. time to inventory & inspect: 25 minutes
- Est. replacement cost of locally-owned: \$1.48 billion
- TAMC-PASER business practice/relationships provide strong framework for data collection/training

# 2018 Culvert Mapping Pilot

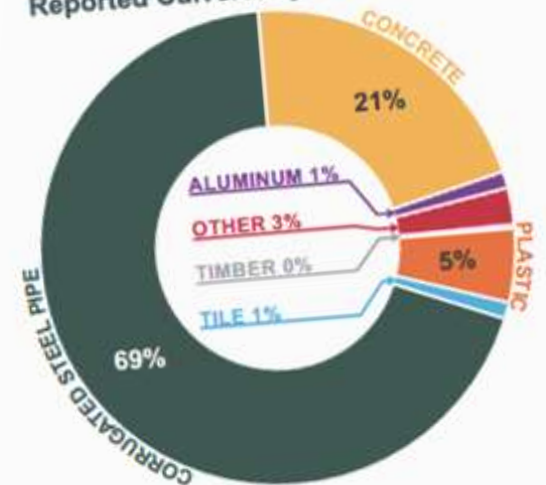
Estimated Local Agency Culvert Condition



Reported Culverts by Span or Diameter (in inches)



Reported Culverts by Material Type



*Full Report Available on TAMC Website*

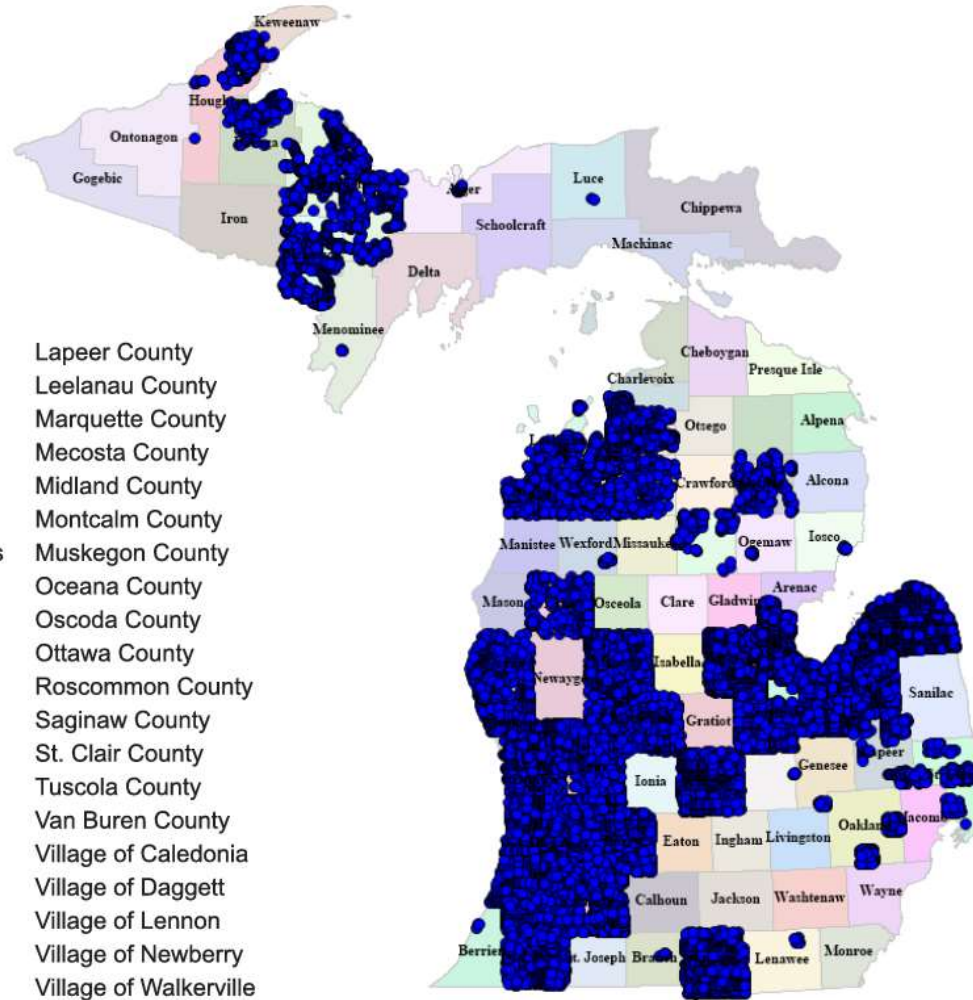


# 2018 Culvert Mapping Pilot

## PARTICIPATING AGENCIES AND LOCATIONS OF INVENTORIED CULVERTS

### Local Road Agencies:

- Allegan County
- Antrim County
- Baraga County
- Barry County
- Bay County
- Benzie County
- Cass County
- City of Benton Harbor
- City of Big Rapids
- City of Cadillac
- City of Coldwater
- City of East Tawas
- City of Farmington Hills
- City of Fenton
- City of Munising
- City of Muskegon Heights
- City of Rochester Hills
- City of Tecumseh
- City of West Branch
- Clinton County
- Dickinson County
- Grand Traverse County
- Hillsdale County
- Houghton County
- Huron County
- Kalamazoo County
- Kalkaska County
- Kent County
- Lake County
- Lapeer County
- Leelanau County
- Marquette County
- Mecosta County
- Midland County
- Montcalm County
- Muskegon County
- Oceana County
- Oscoda County
- Ottawa County
- Roscommon County
- Saginaw County
- St. Clair County
- Tuscola County
- Van Buren County
- Village of Caledonia
- Village of Daggett
- Village of Lennon
- Village of Newberry
- Village of Walkerville





# TAMC Dashboards & Interactive Map

The screenshot shows a web browser window with the following details:

- Browser tabs: 2018-PA-0325.pdf, MILogin - Home Page, TAMC - Transportation, Michigan Transportation
- Address bar: <https://www.mcgi.state.mi.us/mitrp/tamcDashboards/reports/pavement>
- Page header: Michigan.gov | HOME | TAMC | ABOUT TAMC
- Breadcrumbs: Dashboards > Pavement
- Section Title: PAVEMENT
- Text: Please choose a Pavement Report from the below options.
- Report Options (from left to right):
  - Pavement Conditions**: Represented by a pie chart with red, green, and yellow segments.
  - Trend Analysis**: Represented by a grouped bar chart with a mouse cursor over one bar.
  - Pavement Forecast**: Represented by a stacked bar chart with red, yellow, and green segments.
  - Non-Fed Aid**: Represented by a pie chart with red, green, and yellow segments.
  - Pavement Comparison**: Represented by a grouped bar chart with blue, green, and yellow bars.

URL at the bottom: <https://www.mcgi.state.mi.us/mitrp/tamcDashboards/reports/pavement/trends?year=2017&areaType=State&area=State of Michigan&jurisdictionType=All Roads&reportType=laneMiles>

# TAMC Dashboards & Interactive Map



# Significant Results

## TAMC Organization Awards 2019

- Case Studies for Successful Implementation
- Local-Agency Examples
  - Barry County
  - Berrien County
  - City of Farmington Hills
- Collaboration Examples
  - Ross Township
  - Wakeshma Township
  - Road Commission of Kalamazoo County





# Future of TAMC & Asset Management

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1. Asset Management Plans – Required of large agencies beginning in 2021
2. More integration collaboration with MIC & WAMC
3. Further integration of Culverts as an Asset Class
4. Traffic Signals
5. Producing Data & Making it Available

# TAMC Resources



**Website:** [www.Michigan.gov/TAMC](http://www.Michigan.gov/TAMC)

**TAMC Help Desk:** (517) 373-7910

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