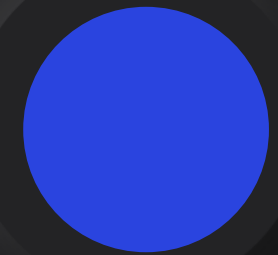


# Extending Pavement Service Life



Michael L. Smith, PE  
Monroe County Road Commission  
Senior Engineer





# Agenda

1

About Monroe County

2

Where We Started and Where We Are Now

3

Developing and Maintaining a 5-Year Primary Road Plan

4

Maintaining a Robust Treatment Toolbox

5

Examples of Multi-Year Staged Construction

6

Recommendations for Network-Level Planning





# About Monroe County

12th largest county road agency in terms of MTF revenue  
(\$22.1 million estimate for FY24)



Approximately 30% urbanized  
(Detroit, Monroe, and Toledo)  
and 70% rural



Primary Road Network =  
440.34 centerline miles  
Primarily HMA surfaced roads with  
approximately 7 miles of gravel  
primary roads and 2 miles of concrete  
primary roads



81 Total Employees  
Executive, Human Resources &  
Customer Service = 5  
Finance = 5  
Engineering = 10  
Maintenance = 61



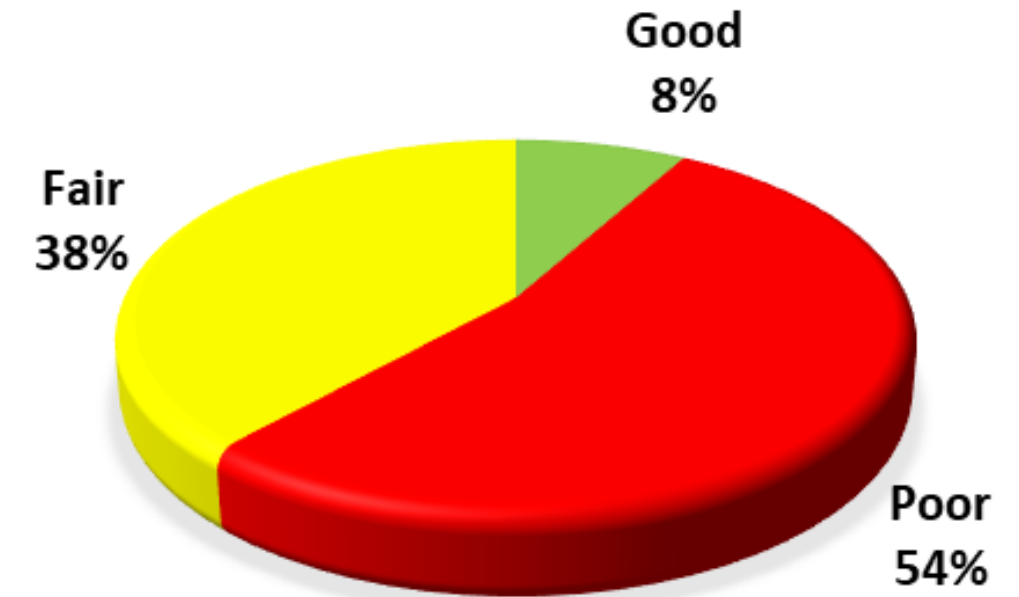


# Where We Started

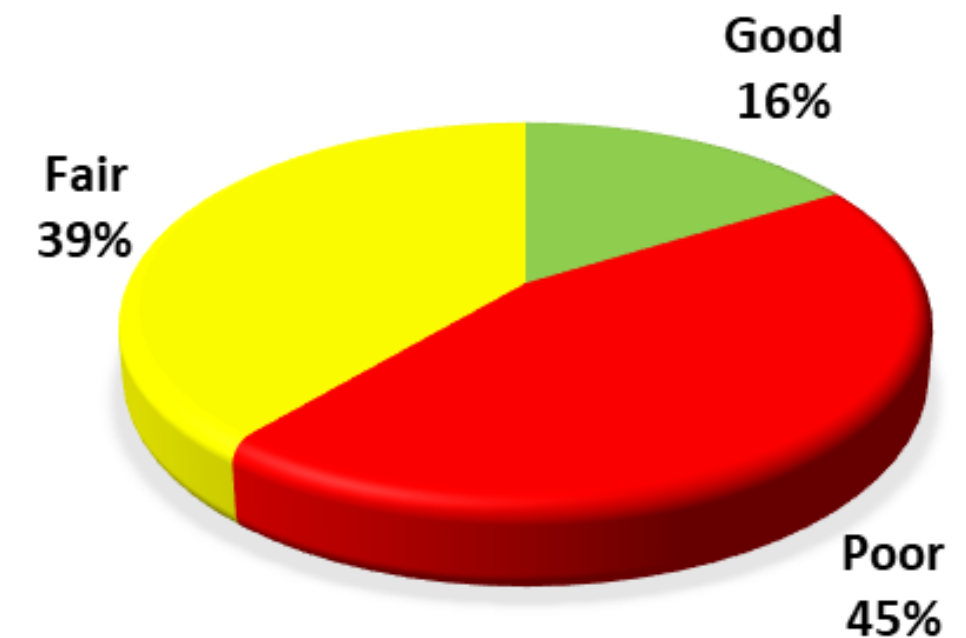
## Primary Road Conditions in 2013

Monroe County's percentage of federal-aid eligible roads in poor condition was 9% higher than the statewide average for county road commissions.

2013 PASER Ratings  
MCRC Federal-Aid Eligible Roads



2013 PASER Ratings  
Statewide County Road Commission  
Federal-Aid Eligible Roads



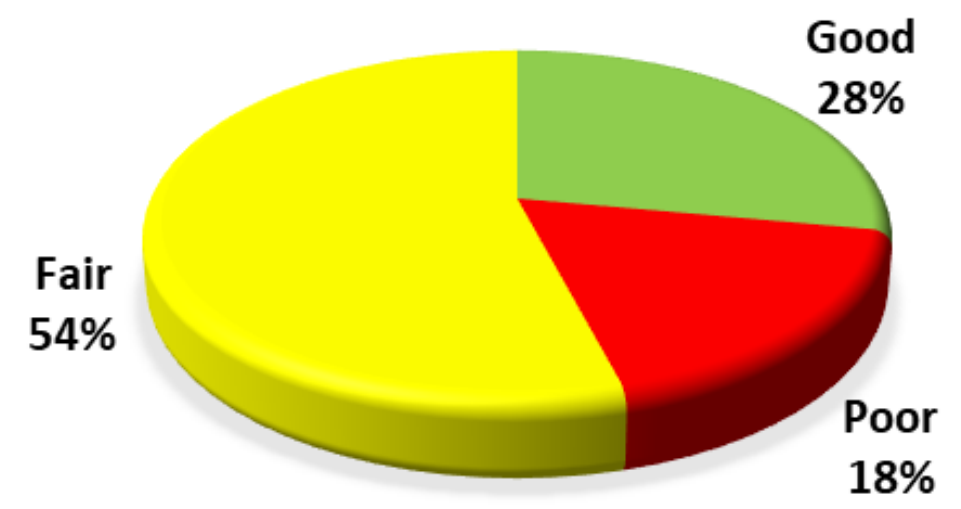


# Where We Are Today

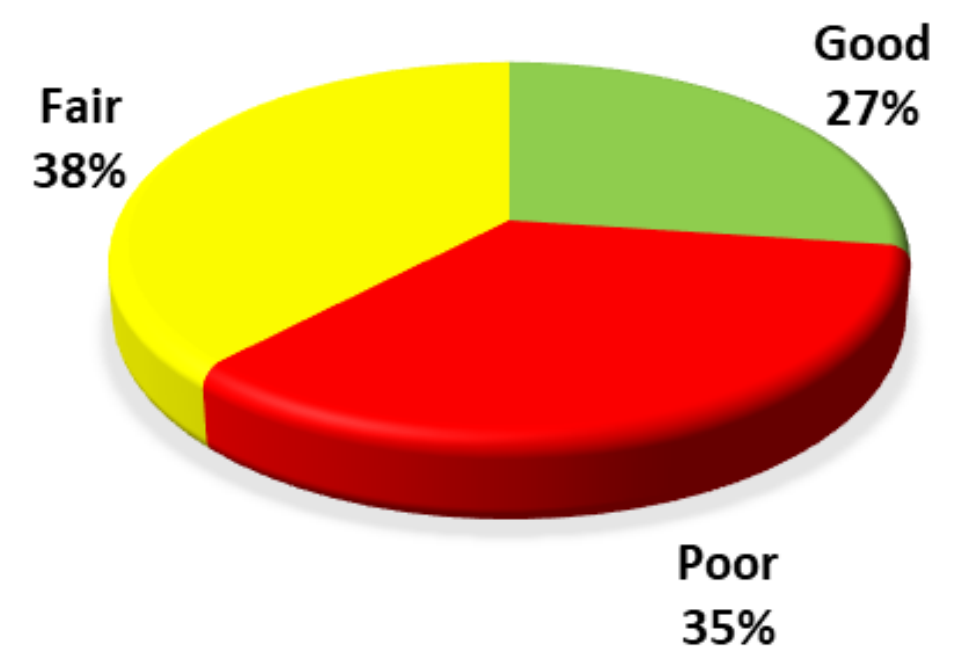
## Primary Road Conditions in 2022

Monroe County's percentage of federal-aid eligible roads in poor condition was 17% lower than the statewide average for county road commissions.

2022 PASER Ratings  
MCRC Federal-Aid Eligible Roads



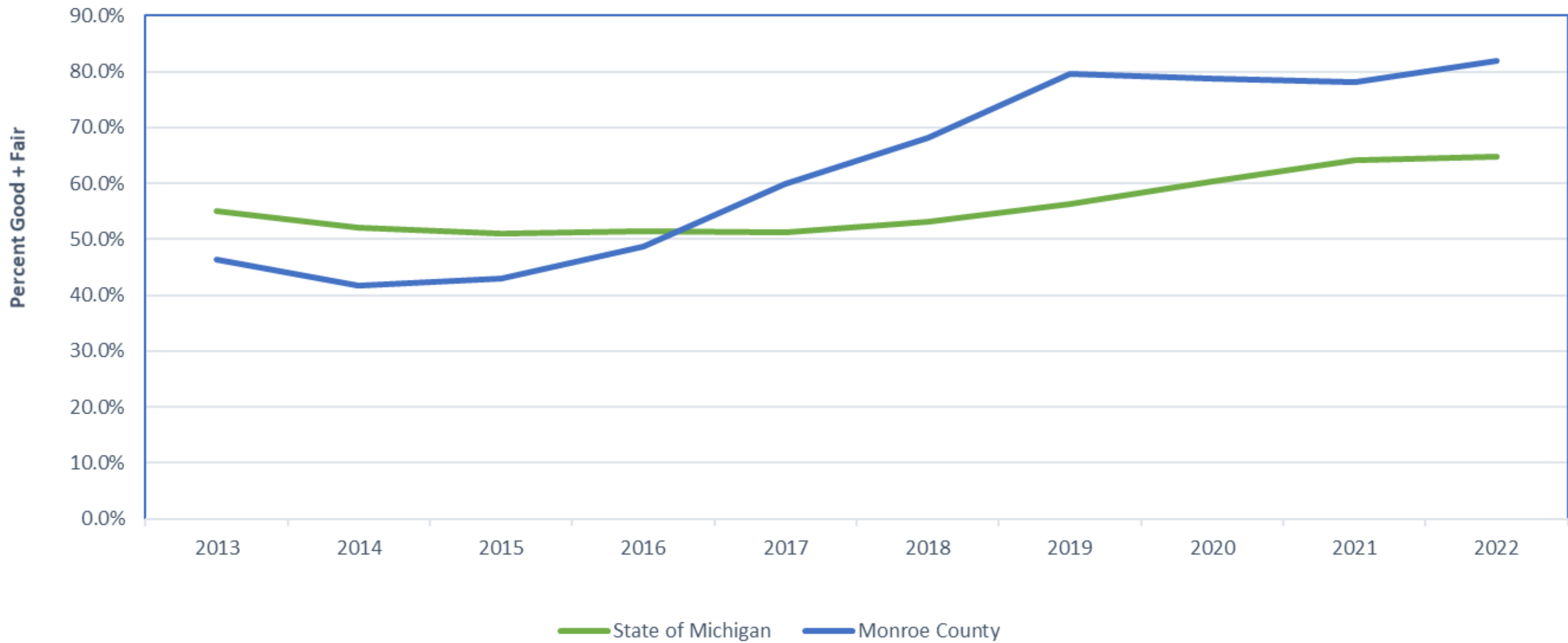
2022 PASER Ratings  
Statewide County Road Commission  
Federal-Aid Eligible Roads





# Federal-Aid Eligible Roads 2013-2022

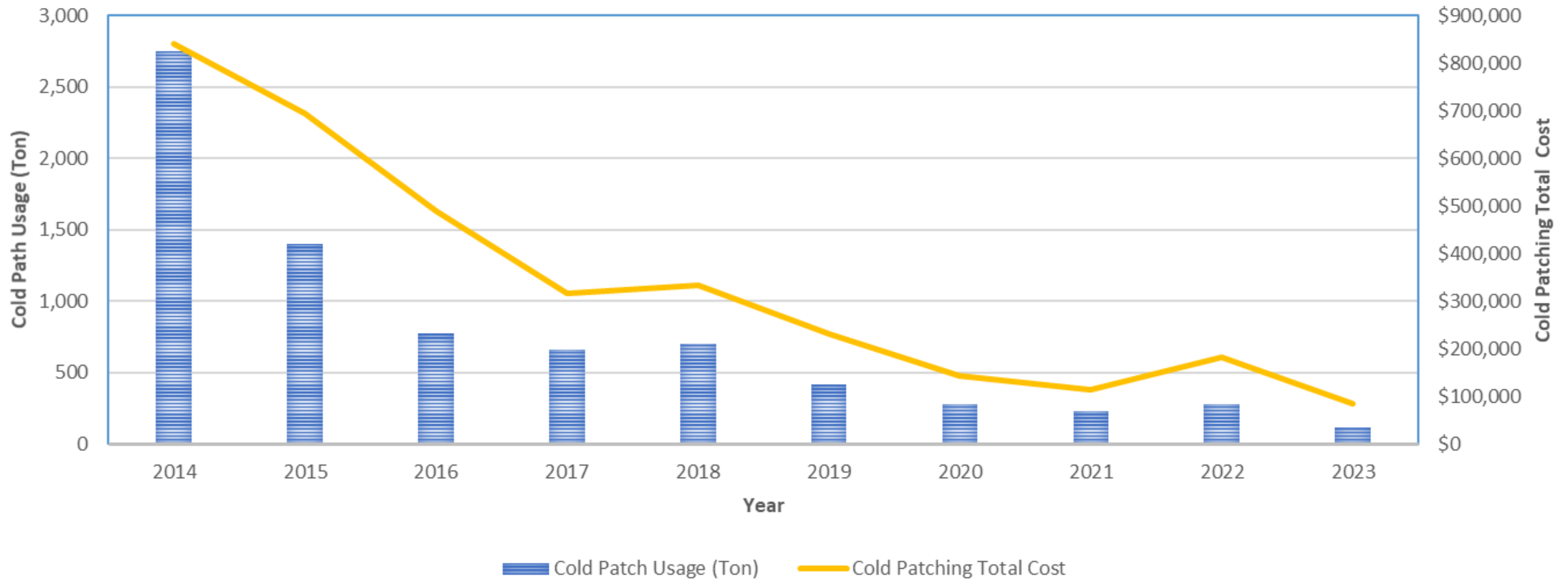
**County Road Commission  
Federal-Aid Eligible Pavement Condition**





# MCRC Cold Patching 2014-2023

## Primary Road Cold Patching






# How We Progressed


## Reasons for the Improvement in Monroe County's Primary Road Network

2014



Received a \$5 million State legislative earmark to rehabilitate 10.06 miles of St. Anthony Road, Secor Road, Samaria Road, and Lakeside Road (Old M-151) in the southern half of the county (Full depth reclamation with two-course HMA overlay).

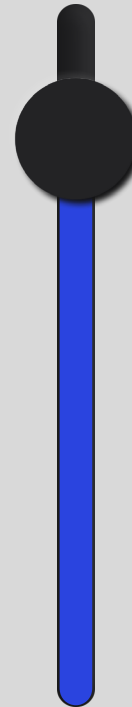
2017



Board authorized a \$5 million bond to rehabilitate approximately 24 miles of road with primarily HMA overlays or HMA mill and fills.

The price of HMA,5E in 2017 was \$58.35/Ton vs. \$107.21/Ton in 2023 - 84% increase over six years.

2018



Received a \$3.35 million state legislative earmark to rehabilitate 12.44 miles of Palmer Road and South Stony Creek Road in the northern half of the county (Full depth reclamation with two-course HMA overlay).

Developed our initial 5-Year Primary Road Plan to maintain the roads we had improved over the previous four years.







# 5-Year Primary Road Plan

## Development Timeline

2016

Board established an objective to develop a 2 to 5-Year plan for the primary road network.

The initial plan developed by MCRC staff focused primarily on describing the types of fixes available (preventive maintenance, light rehabilitation, and heavy rehabilitation), and the plan also included assumptions for future funding levels of road improvements.

However, the plan did not identify any specific projects. While the Board appreciated the initial attempt, the plan never progressed beyond the initial stage of development.

2017

No work was done on 5-Year plan.

This was due to the time and effort involved in designing and building the projects funded with the \$5 million road bond and because the County Highway Engineer, Scott Assenmacher, departed from the Monroe County Road Commission.

2018

The 5-Year plan was resurrected by the Board and Managing Director, with three individuals tasked to re-develop the plan.

Matthew Snell, PE  
County Highway Engineer

David Leach  
Superintendent of Maintenance

Michael Smith, PE  
Project Engineer



# 5-Year Primary Road Plan

## Development Timeline Continued

2018

Steps taken when the initial 5-Year Primary Road Plan was developed

- Worked with our Managing Director and Director of Finance to establish a budget for each calendar year
- Reduced the county into smaller, more manageable areas (15 townships)
- Established target allocations for each township based on 65% population and 35% primary road mileage
- Created an Excel worksheet for each township with segments of approximately 1 mile in length (used Physical Road Numbers and Mile Points from MGF and Roadsoft database when building the worksheets)
- Prepared estimated costs per centerline mile for each of the treatments
- Started with preventive maintenance treatments for recently resurfaced roads and added in resurfacing projects where the budget allowed
- Our initial, unwritten maintenance schedule for our lower volume roads (<4,000 vehicles per day) was overband crack filling two years after resurfacing and a single chip seal three years after resurfacing
- Our initial, unwritten maintenance schedule for our higher volume roads (>4,000 vehicles per day) was overband crack filling two years after resurfacing



# 5-Year Primary Road Plan

## Development Timeline Continued

2019

Moved the overband crack fill treatment from two years after resurfacing to one year after resurfacing.

This was a workaround to pull scheduled overband crack fill treatments a year forward if we experienced more cracking than expected during the first winter.

2021

Established our first written maintenance treatment schedules for roads based on Road Surface and Average Daily Traffic.

For our lower volume roads (<4,000 ADT), we moved the initial single chip seal to the year after the road was resurfaced. After that, we assumed a 5-year chip seal cycle.

For most of our higher volume roads (>4,000 ADT), our maintenance schedule consisted of two overband crack fill treatments followed by microsurfacing eight years after the road was resurfaced.

Started accounting for future treatments beyond the 5-year plan period.

Added Maintenance Supervisor Chris Carter to the team and assigned each member either 3 or 4 townships to update on their own.





# 5-Year Primary Road Plan

## Development Timeline Continued

2022

Increased the chip seal cycle on our lower volume roads from 5 years to 6 years to offset price increases.

Improved the visual appeal of the plan by having our Administrative Assistant/Deputy Clerk, Karley Woodhull, jazz up the cover sheet with photographs of our crews and the MCRC mission statement.

Continued our campaign to increase public awareness of the plan by uploading to our website and social media platforms as well as presenting the plan at various public events.

**MONROE COUNTY ROAD COMMISSION**

**5-YEAR PRIMARY ROAD PLAN 2023-2027**

Adopted by the Board of County Road Commissioners of the County of Monroe, Michigan on August 28, 2023.

*The Monroe County Road Commission vows to provide quality, courteous and dependable professional services through innovative, cost-effective ways to maintain our road system through transparency, trust and collaboration between citizens, businesses and government.*

**M**  
Michigan's Competitive



# 5-Year Primary Road Plan

## Example Worksheet - Ida Township

Formula: `=ROUNDUP(IF($B18="Y",IFERROR($K18/2*(VLOOKUP(AI18,'Cost Information'!$A$5:$J$31,10,FALSE))*$J18,)/2,IFERROR($K18/2*(VLOOKUP(AI18,'Cost Information'!$A$5:$J$31,10,FALSE))*$J18,)),-3)`

	A	D	E	F	J	K	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ		
1	Annual Total							\$209,000		\$733,000		\$229,000		\$449,000		\$235,000		5-Year					
2	Annual Target							\$394,000		\$302,000		\$320,000		\$420,000		\$229,000		Difference					
3	Annual Difference							(\$185,000)		\$431,000		(\$91,000)		\$29,000		\$6,000		\$201,000					
4																							
5							Planned Road Improvement and Cost										Next Planned Treatment						
6	Township	Road	From	To	Length (miles)	Lanes	2023	Cost	2024	Cost	2025	Cost	2026	Cost	2027	Cost	Future	Year of Treatment	Road Improvement Codes:				
7	Ida	Ida Center	Wells	Secor	1.10	2											OBC	\$8,000	SS	2028	OBC	Overband Crack Fill	
8	Ida	Ida Center	Secor	Douglas	0.98	2											OBC	\$7,000	SS	2028	SS	Single Chip Seal	
9	Ida	Ida Center	Douglas	Jackman	1.00	2	SS	\$19,000										OBC		2028	FS	Fog Seal	
10	Ida	Ida Center	Jackman	Lewis	1.01	2	SS	\$20,000										OBC		2028	OBC	Overband Crack Fill	
11	Ida	Ida Center	Lewis	Geiger	0.92	2												OBC	\$6,000	SS	2028	SS	Single Chip Seal
12	Ida	Ida Center	Geiger	Minx	1.06	2												OBC	\$7,000	SS	2028	FS	Fog Seal
13	Ida	Ida East	Lewis	Geiger	1.10	2	OBC	\$4,000	MS	\$44,000								MS		2031	GR	Gravel Lift	
14	Ida	Ida West	Wells	Gloff	1.00	2	OBC	\$4,000	TW/MS	\$115,000								MS		2031	DS	Double Chip Seal	
15	Ida	Ida West	Gloff	Meanwell	1.01	2	OBC	\$4,000	TW/MS	\$115,000								MS		2031	MM/SS	Micro Mill & Single Chip Seal	
16	Ida	Ida West	Meanwell	Twp Line	1.01	2	OBC	\$4,000	TW/MS	\$115,000								MS		2031	SS/MS	Cape Seal (Single Chip Seal & Microsurfacing)	
17	Ida	Ida West	Twp Line	Lewis	1.00	2	OBC	\$4,000	TW/MS	\$115,000								MS		2031	MS	Microsurface	
18	Ida	Lewis	Rauch	Morocco	1.02	2					OBC	\$7,000	MS	\$80,000				MS		2033	HIPR/SS	Hot In-Place Recycling & Single Chip Seal	
19	Ida	Lewis	Morocco	Todd	0.97	2					OBC	\$7,000	MS	\$76,000				MS		2033	UT	Ultra-Thin HMA Overlay	
20	Ida	Lewis	Todd	Ida Center	1.00	2					OBC	\$7,000	MS	\$79,000				MS		2033	SCR/SS	HMA Scratch Course & Single Chip Seal	
21	Ida	Lewis	Ida Center	Lulu	1.02	2					OBC	\$7,000	MS	\$80,000				MS		2033	TW	Trench Widening	
22	Ida	Lewis	Lulu	Albain	1.00	2					OBC	\$7,000	MS	\$78,000				MS		2033	OL	HMA Overlay	
23	Ida	Lewis	Albain	Westwood	0.71	2					OBC	\$5,000	MS	\$56,000				MS		2033	MF	HMA Mill and Fill	
24	Ida	Lewis	Westwood	Ida West	0.37	4					MF	\$170,000			OBC	\$5,000	OBC		2032	CP/SS	Cold Pave & Single Chip Seal		
25	Ida	Rauch	Wells	Secor	1.13	2			SS	\$11,000								OBC		2029	TW/MS	Trench Widening & Microsurfacing	
26	Ida	Secor	Rauch	Morocco	0.99	2	OL	\$150,000	SS	\$19,000								OBC		2029	BS/DS	Base Stabilization & Double Chip Seal	
27	Ida	Secor	Morocco	Todd	0.99	2			OL	\$199,000	SS	\$19,000						OBC		2030	CS/OL	Crush and Shape & HMA Overlay	
28	Ida	Secor	Todd	Ida Center	1.00	2									OL	\$202,000	SS		2028	JR/MF	Joint Repair & HMA Mill and Fill		
29																					CIPR/OL	Cold In-Place Recycling & HMA Overlay	



# Treatment Toolbox

Overband  
Crack Fill

Single Chip  
Seal

Double  
Chip  
Seal

Fog  
Seal

Microsurfacing

Cape  
Seal

Ultra-Thin  
HMA  
Overlay

HMA  
Overlay

HMA  
Mill & Fill

HMA  
Multi-Overlays

Cold In-Place  
Recycling

Cold  
Central  
Plant  
Recycling

Hot In-Place  
Recycling

Full Depth  
Reclamation

HMA Base  
Crushing  
and  
Shaping

Trenching  
and HMA  
Base  
Widening





# Staged Construction

## Example 1

Brewer Road & Petersburg Roads  
in Dundee Township  
(6 miles long)

- Originally constructed in 1916
- 16-foot wide chip seal over 8-inch waterbound Macadam

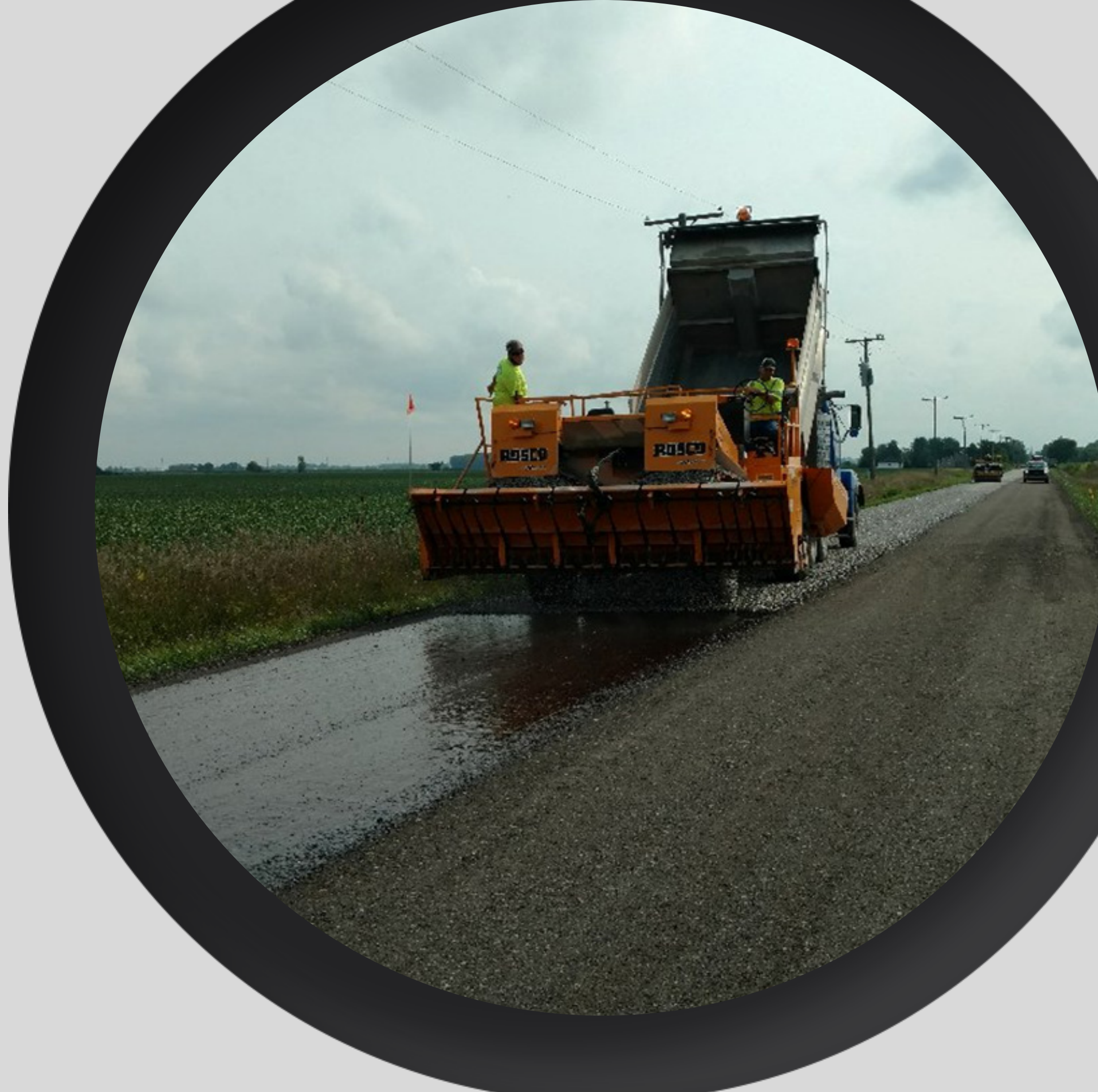




# Staged Construction

2016-2019

- 4-foot wide trenching and aggregate base widening along both edges
- Added Aggregate or RAP to correct crown
- 6-inch full-depth reclamation with emulsified asphalt
- Double chip seal surface







# Staged Construction

## 2022

- Overlaid 1.5 miles of the stabilized base with a single 2" lift of HMA under the countywide HMA Paving contract.

## 2023

- Overlaid the remaining 4.5 miles of the stabilized base with a single lift of HMA under an MDOT local agency project.



# Staged Construction

## Example 2

Plank Road  
in Dundee, London, &  
Raisinville Townships  
(4.25 miles long)

- Unknown construction date  
(listed as an unimproved road in  
1959)
- HMA over gravel





# Staged Construction

2015

- Added millings to the existing surface from a mill and fill project on Plank Road (north of this project)
- Crushed and shaped the existing surface
- Resurfaced with a single 2-inch lift of HMA, LVSP





# Staged Construction



2017

Full-depth HMA repairs in two areas  
and Single Chip Seal



2018

Single-lift HMA overlay with  
2" of HMA, LVSP



2020

Single Chip Seal





# Recommendations

## Network-Level Planning

Involve multiple departments in the planning process. At Monroe County, it has been a collaborative effort between the Board, Management, Finance, Engineering, and Maintenance.

Develop a robust toolbox of preventive maintenance and rehabilitation treatments to proactively extend pavement life, minimize reactive maintenance, and provide safer roads.

Formulate maintenance schedules while maintaining flexibility regarding the timing of the treatment applications.

Draw upon the success and innovations of others

- County road commissions
- Michigan Department of Transportation
- Contractors
- RoadResource.org – “How I Built This Network” webinars
- Center for Technology & Training
- National Center for Pavement Preservation





# Questions?

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msmith@mcrc-mi.org  
734-240-5103



MONROE COUNTY  
**ROAD**  
COMMISSION