

The State of Michigan Transportation Asset Management Council

2014 PASER Survey Lapeer County



Prepared by the
Genesee County Metropolitan Planning Commission

**The State of Michigan
Transportation Asset Management Council
2014 PASER Road Survey
Lapeer County**

Project Overview:

On August 11 through August 14, 2014, GLS Region V staff, along with representatives of the Lapeer County Road Commission (LCRC) and the Michigan Department of Transportation (MDOT) assessed the condition of Lapeer County federal aid eligible roads using the PASER road rating system as requested by the State of Michigan Transportation Asset Management Council.

PASER Road Rating System:

The PASER Road Rating System was developed by the University of Wisconsin-Madison Transportation Information Center to be used as the State of Wisconsin's standard road rating system. PASER is a "windshield" road rating system that uses a 1 to 10 rating scale, with a value of 10 representing a new road and a value of 1 representing a failed road. Condition ratings are assigned by monitoring the type and amount of visual defects along a road segment while driving the segment. The PASER system interprets these observations into a condition rating. PASER rating charts for asphalt and concrete roads have been included with this report.

The State of Michigan Transportation Asset Management Council has requested that the information gathered in this survey be reported using the following categories:

- **Roads with PASER ratings of 8-10 require Routine Maintenance.** Routine maintenance is the day-to-day maintenance activities that are scheduled, such as street sweeping, drainage clearing, gravel shoulder grading and sealing cracks to prevent standing water and water penetration.
- **Roads with PASER ratings of 5-7 require Capital Preventive Maintenance.** Capital preventive maintenance is a planned set of cost effective treatments to an existing roadway system and its appurtenances that preserves, retards future deterioration and maintains or improves the functional condition of the system without significantly increasing structural capacity. The purpose of capital preventive maintenance fixes is to protect the pavement structure, slow the rate of pavement deterioration and/or correct pavement surface deficiencies. Surface treatments are targeted at pavement surface defects primarily caused by the environment and by pavement material deficiencies.
- **Roads with PASER ratings of 1-4 require Structural Improvements.** This category includes work identified as rehabilitation and reconstruction, which address the structural integrity of a road.

Computer Equipment and Software:

Staff collected data using a laptop computer with the RoadSoft GIS Laptop Data Collector 7.7 software loaded. A GPS unit was connected to the laptop to track position and locate road segments. *Note: Please contact RoadSoft staff for questions regarding a specific GPS units' compatibility with the RoadSoft program.* RoadSoft GIS is an asset management software package created and distributed free of charge by the Michigan Technological University's Center for Technology and Training. The current version of the program was designed with a special module to collect PASER rating data.

Staff Time:

Three staff members is the optimal amount to use for collecting PASER data. One drives, one rates the roads, and the third staff member enters information into the computer. For the Lapeer County road rating project there was always one Region V representative, one LCRC representative and one MDOT representative present. It took 20 hours to rate 453.25 linear miles of road, averaging approximately 17 miles per hour. This report provides information in lane miles which is linear miles multiplied by the number of lanes. Lane mile calculations provide a better representation of the condition of the system and what it may take to maintain the system.

Training:

All participants in the survey were required to attend a day long training session hosted by the Michigan Transportation Asset Management Council. Participants received an overview of the project and were given instruction on how to use the RoadSoft software and the PASER road rating system for data collection. Once out in the field, experienced staff members taught new participants how to use the RoadSoft program and guided them through the rating process. Most participants felt comfortable after an hour of working the computer and rating the roads.

Overview of the Federal Aid Network:

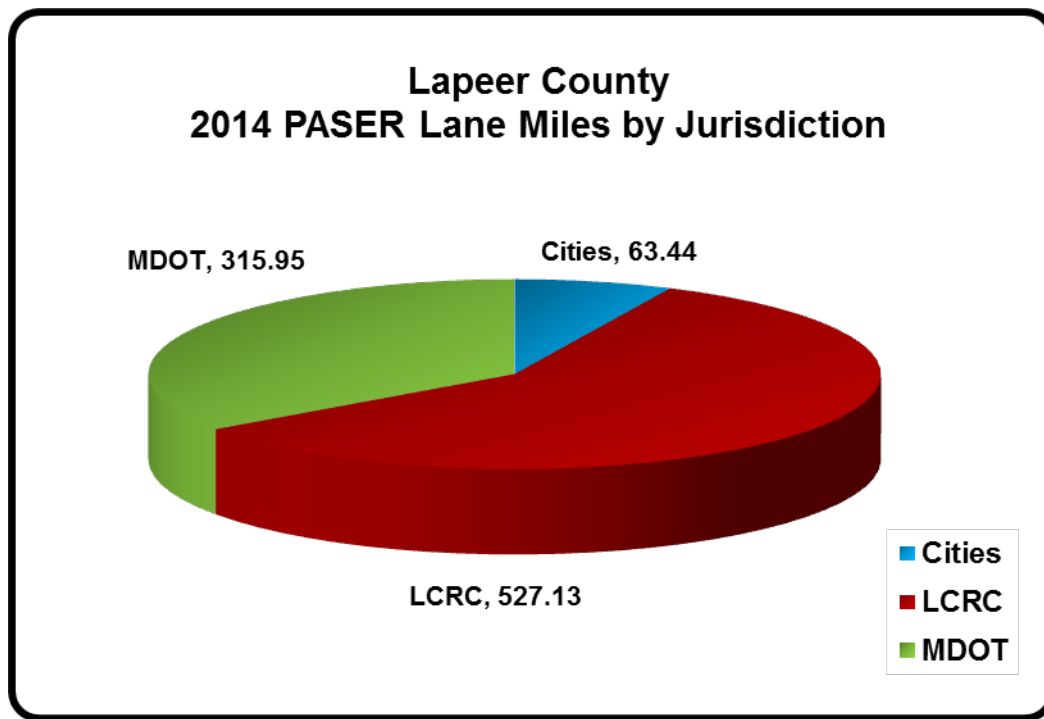
The Lapeer County Federal Aid network is comprised of approximately 906.52 lane miles. Of the total, 527.13 lane miles (58%) are within Townships, which are under the jurisdiction of the Lapeer County Road Commission (LCRC). Approximately 315.95 lane miles (35%) of roadway are state trunk lines, which are maintained by the Michigan Department of Transportation (MDOT). Of the total roads surveyed, 783.01 lane miles (approximately 86%) were asphalt, and 123.51 lane miles (approximately 14%) were concrete. Local Road agencies with the greatest amount of federal aid miles within their jurisdiction are the LCRC with 527.13 lane miles, City of Lapeer with 41.19 lane miles, and the City of Imlay City with 5.16 lane miles.

2014 PASER Rating by Cities and Villages					
Description	1 to 4 Structural Improvements	5 to 7 Capital Preventative Maintenance	8 to 10 Routine Maintenance	Total Lane Miles	Percentage of PASER Lane Miles in Jurisdiction
Almont	1.06	0.00	0.00	1.06	1.7%
Clifford	5.35	0.00	0.00	5.35	8.4%
Columbiaville	2.98	0.34	0.00	3.32	5.3%
Dryden	0.86	0.64	0.67	2.17	3.4%
Imlay City	3.39	1.77	0.00	5.16	8.1%
Lapeer	24.94	13.14	3.11	41.19	64.9%
Metamora	0.00	1.52	0.00	1.52	2.4%
North Branch	1.46	0.00	0.00	1.46	2.3%
Otter Lake	0.77	1.01	0.43	2.21	3.5%
Total	40.81	18.42	4.21	63.44	100%
Percentage	64%	29%	7%	100%	

2014 PASER Rating by Townships					
Description	1 to 4 Structural Improvements	5 to 7 Capital Preventative Maintenance	8 to 10 Routine Maintenance	Total Lane Miles	Percentage of PASER Lane Miles in Jurisdiction
Almont Twp	12.24	4.95	0.00	17.19	3.3%
Arcadia Twp	19.29	8.99	4.01	32.29	6.1%
Attica Twp	19.42	4.78	12.02	36.22	6.9%
Burlington Twp	25.98	0.00	0.00	25.98	4.9%
Burnside Twp	3.96	0.00	8.02	11.98	2.3%
Deerfield Twp	20.64	7.96	0.00	28.60	5.4%
Dryden Twp	18.22	5.49	0.99	24.70	4.7%
Elba Twp	29.25	19.87	1.14	50.26	9.5%
Goodland Twp	19.42	3.92	0.00	23.34	4.4%
Hadley Twp	20.65	10.46	1.51	32.62	6.2%
Imlay Twp	14.53	0.09	3.51	18.13	3.4%
Lapeer Twp	27.31	14.42	8.66	50.39	9.6%
Marathon Twp	36.07	4.02	0.74	40.83	7.7%
Mayfield Twp	32.92	2.62	4.88	40.42	7.7%
Metamora Twp	2.60	7.58	4.18	14.36	2.7%
North Branch Twp	18.12	0.00	5.00	23.12	4.4%
Oregon Twp	35.34	4.00	0.00	39.34	7.5%
Rich Twp	17.13	0.23	0.00	17.36	3.3%
LCRC Total	373.09	99.38	54.66	527.13	100%
Percentage	71%	19%	10%	100%	

2014 PASER Rating by Jurisdiction					
Description	1 to 4 Structural Improvements	5 to 7 Capital Preventative Maintenance	8 to 10 Routine Maintenance	Total Lane Miles	Percentage of PASER Lane Miles in Jurisdiction
Cities	40.81	18.42	4.21	63.44	7%
LCRC	373.09	99.38	54.66	527.13	58%
MDOT	73.03	169.28	73.64	315.95	35%
Lapeer Total	486.93	287.08	132.51	906.52	100%
Percentage	54%	32%	14%	100%	

*** Township federal aid roads are under the Jurisdiction of the Lapeer County Road Commission (LCRC)

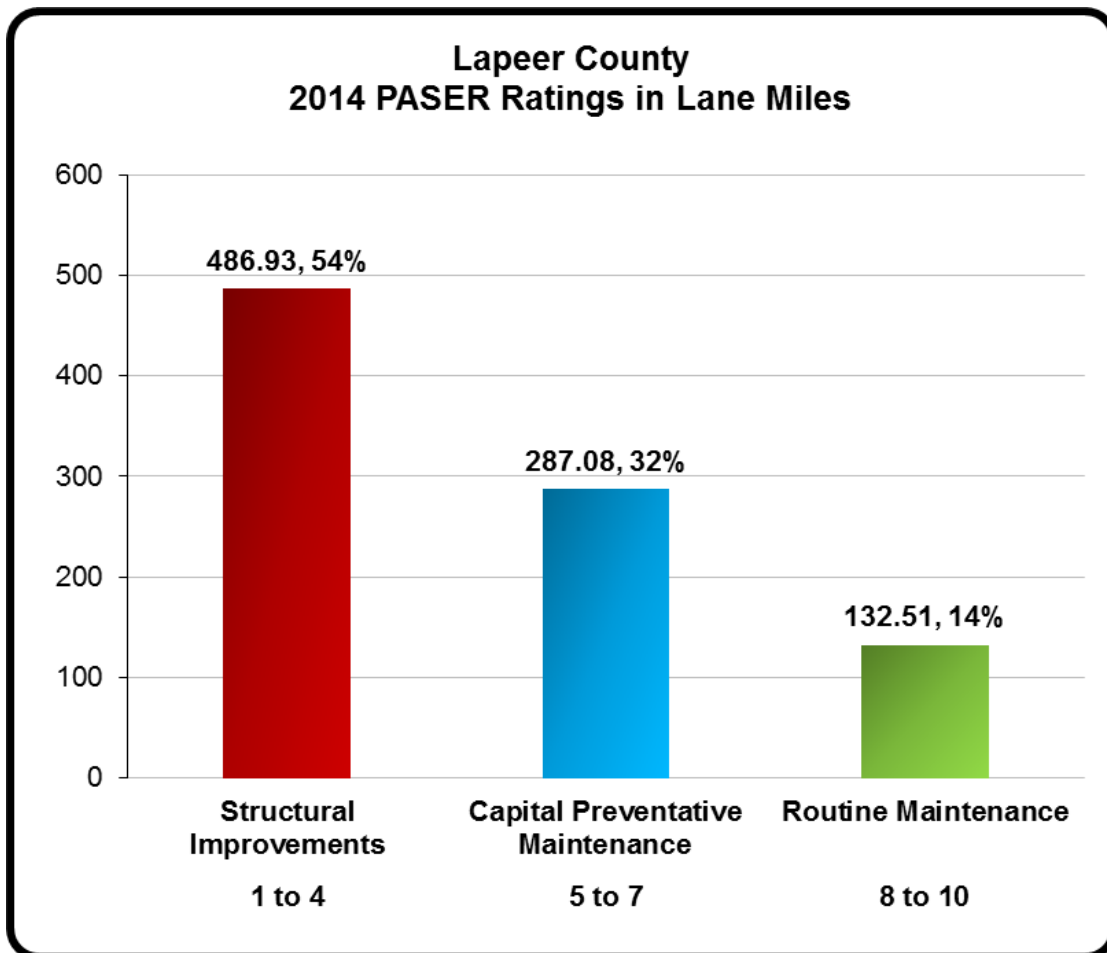


Results:

Approximately 906.52 lane miles of federal aid eligible roads were rated for this project. The chart on the following page summarizes the distribution of ratings by mileage and percentage of the total for all roads rated in the project. The data is distributed into three categories, in which 486.93 lane miles (54%) received a rating less than or equal to 4; 287.08 lane miles (32%) of the roads rated received a rating of 5, 6 or 7; and 132.51 lane miles (14%) of the roads rated received a rating of 8 or better. The Asset Management Council has prescribed a fix for each of the PASER rating categories:

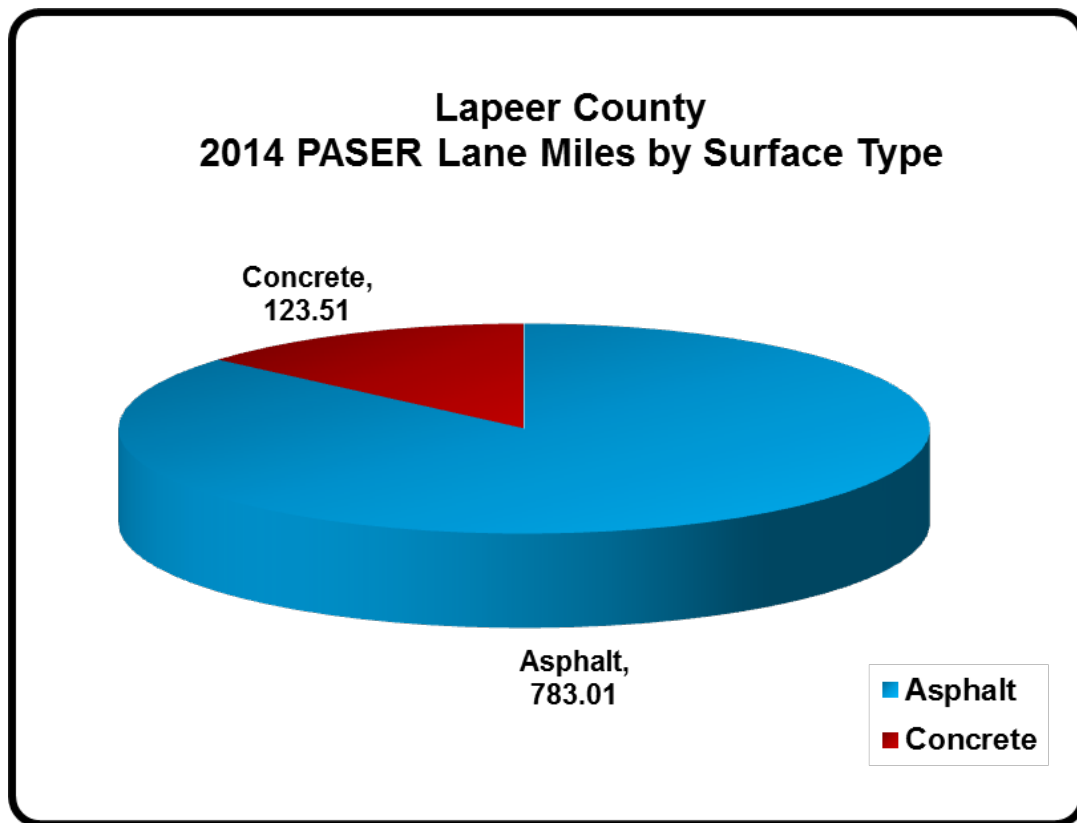
- Roads receiving a rating less than or equal to 4 require Structural Improvements
- Roads receiving a rating of 5-7 require Capital Preventive Maintenance
- Roads receiving a rating of 8 or better require only Routine Maintenance

Lapeer County 2014 PASER Ratings			
PASER Rating	Prescribed Fix	Total Lane Miles	Percentage of PASER Lane Miles
1 to 4	Structural Improvements	486.93	54%
5 to 7	Capital Preventative Maintenance	287.08	32%
8 to 10	Routine Maintenance	132.51	14%

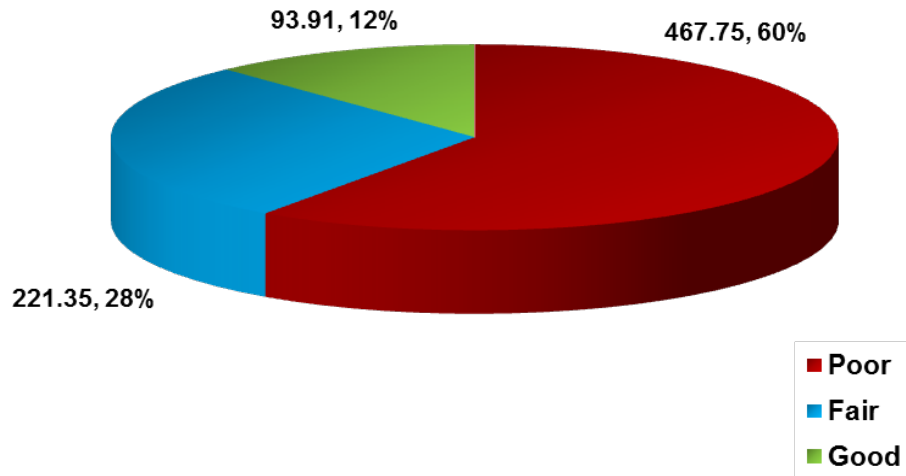


The following tables and charts provide a summary of the 2014 PASER survey ratings by surface type.

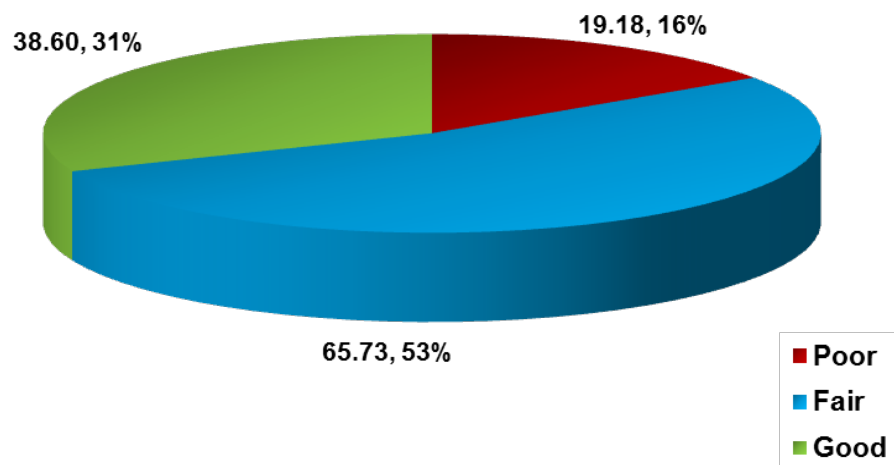
2014 PASER Rating by Surface Type					
Description	1 to 4 Structural Improvements	5 to 7 Capital Preventative Maintenance	8 to 10 Routine Maintenance	Total Lane Miles	Percentage of PASER Lane Miles
Asphalt	467.75	221.35	93.91	783.01	86.4%
Concrete	19.18	65.73	38.60	123.51	13.6%
Total	486.93	287.08	132.51	906.52	100%
Total %	54%	32%	14%	100%	



Lapeer County 2014 PASER Asphalt Ratings in Lane Miles

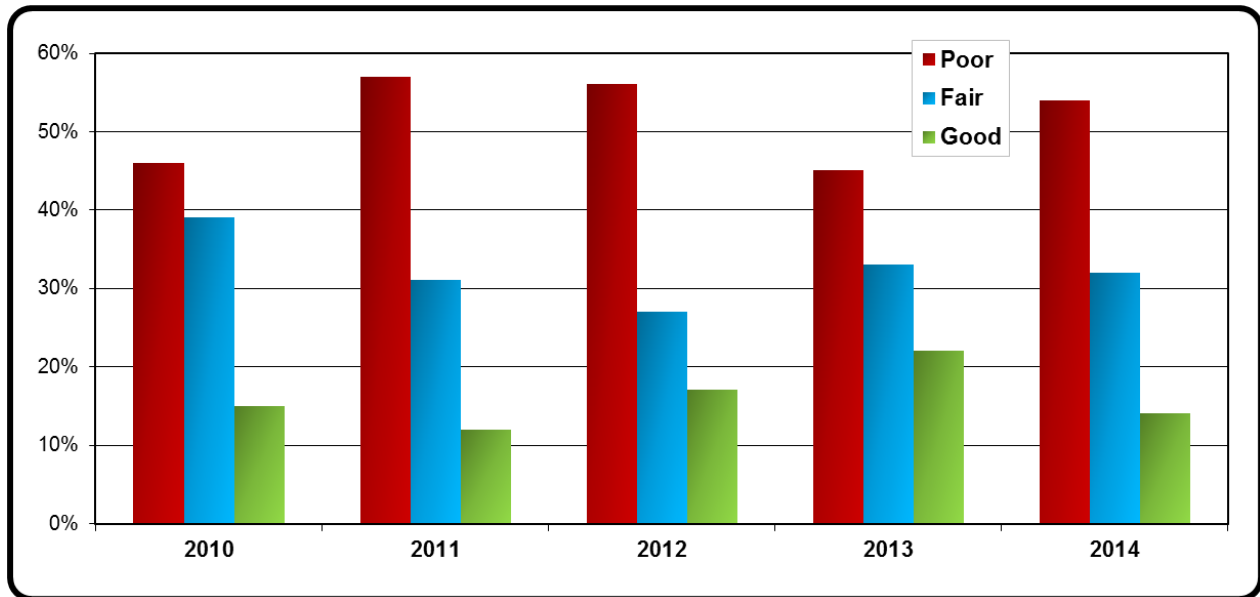


Lapeer County 2014 PASER Concrete Ratings in Lane Miles

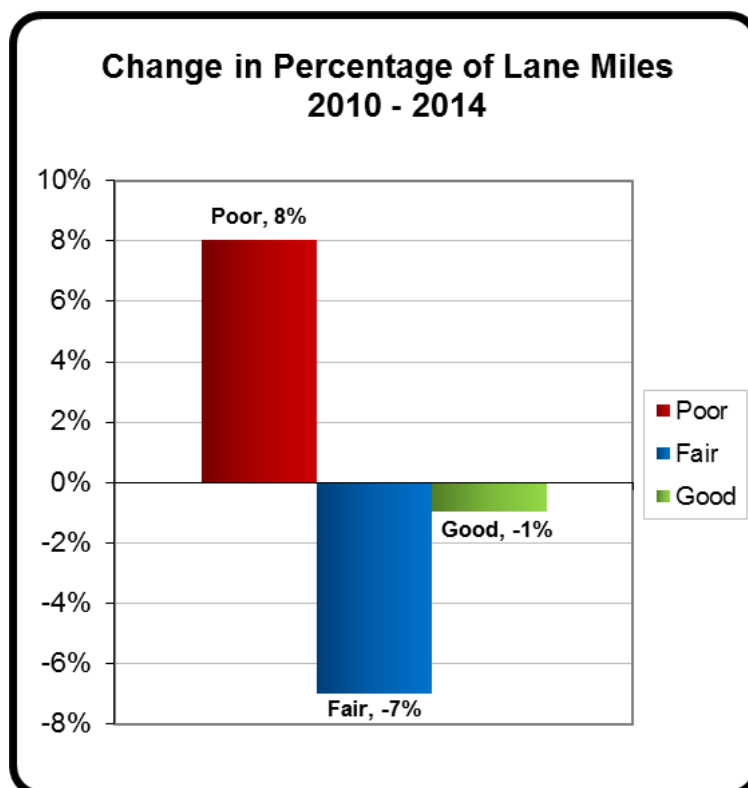


Comparison of 2010 to 2014 Lapeer County PASER Surveys

The following section analyzes data from PASER surveys conducted between 2010 and 2014 for Lapeer County as a whole and for each individual road agency. The data is provided in lane miles and as percent of lane miles for a given year.



*The graph above illustrates the percent of lane miles in each rating category for each year.



- In 2014, approximately 54% (486.93 lane miles) of the Federal Aid Road System received a PASER rating between 1 and 4. Roads with 1 to 4 ratings require structural improvements that may include full depth repairs, a major overlay or reconstruction. This represents an increase of 8% as compared to the 2010 rating distribution in the same category.
- In 2014, approximately 32% (287.08 lane miles) of the Federal Aid Road System received a PASER rating between 5 and 7. Roads with 5 to 7 ratings require capital preventative maintenance treatments, such as partial depth joint repairs, a seal coat or crack filling. This represents a decrease of 7% as compared to the 2010 rating distribution in the same category.
- In 2014, approximately 14% (132.51 lane miles) of the Federal Aid Road System are in the PASER Rating Category of 8 to 10. Roads with 8 to 10 ratings require only routine maintenance. This represents a decrease of 1% as compared to the 2010 rating distribution in the same category.

The general trend we are seeing in 2014 is an increase in lanes miles requiring structural improvements, and a decrease in lane miles requiring only routine maintenance. After a slight improvement in road conditions between 2012 and 2013, many roads moved from the "fair" or "good" rating category into the "poor" category between 2013 and 2014. The decline in PASER ratings between 2013 and 2014 occurred on roads under most jurisdictions, including MDOT, the Lapeer County Road Commission, and roads maintained by cities and villages. This is most likely due to a combination of a particularly harsh winter in 2013/2014, and a lack of available funding to address the needs of the road system. As less funding is available to make structural improvements, we have seen a shift toward treatments that focus on road preservation, rather than reconstruction.

A deterioration trend was analyzed during the development of the 2040 Genesee County Long Range Transportation Plan. As part of the analysis, staff used the RoadSoft program to evaluate several different maintenance scenarios and found that the only way to improve the overall condition of the system is to provide at least 3 times the current level of funding for road improvements. This is a trend that is seen in similar analysis statewide, and can be reasonably applied to Lapeer County. As part of a pavement management program, an increased level of funding would help to stabilize roads that require routine and preventative maintenance and would also be able to incrementally improve roads that require more costly structural repairs.

The data provided in the following tables represents the percent of lane miles in each rating category for each year between 2010 and 2014 and the change in each rating category between 2010 to 2014 for each jurisdiction and Lapeer County as a whole.

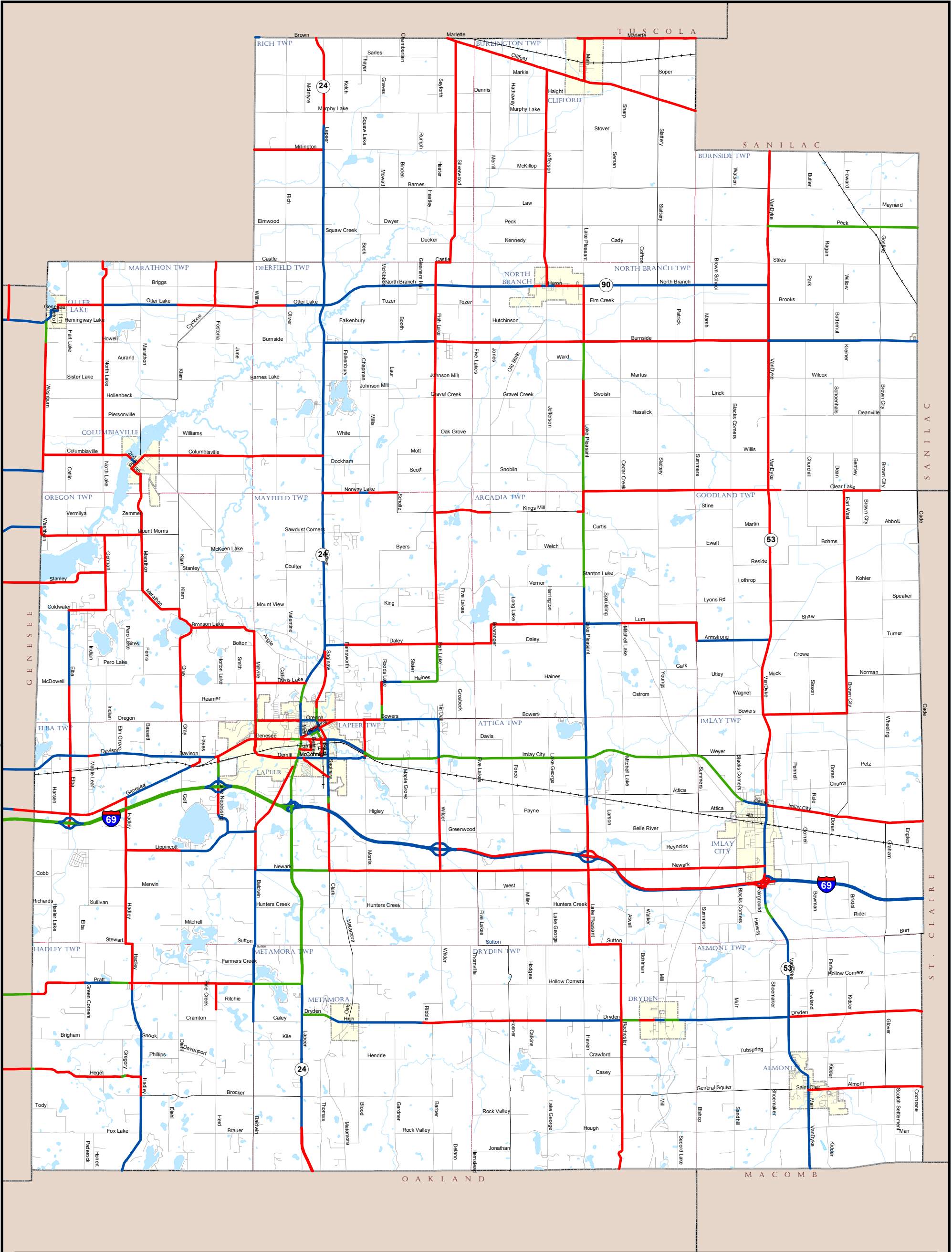
Lapeer County	2010	2011	2012	2013	2014	Change 2010-2014
Good 8 to 10	15%	12%	17%	22%	14%	-1%
Fair 5 to 7	39%	31%	27%	33%	32%	-7%
Poor 1 to 4	46%	57%	56%	45%	54%	8%
2014 Lane Miles: 906.52						

Updating the ratings:

According to the Governmental Accounting Standards Board Statement 34 (GASB 34), governmental units receiving, or applying for federal money must assess the condition of their roads at least once every three years. This project has laid the foundation to meet the requirements of GASB 34 and continues to demonstrate that it can be accomplished with minimal staff in a relatively short period of time.

To obtain a digital copy of the data collected in this study, each Local Road Agency (LRA) must submit a written request to Region V staff. The data will be distributed as a RoadSoft GIS file, so each LRA must also obtain a copy of the latest RoadSoft GIS program from Michigan Tech prior to using the data.

PASER THEMATIC MAPS

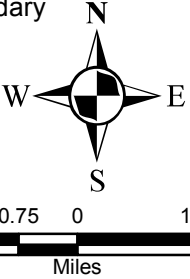


Lapeer County Roads

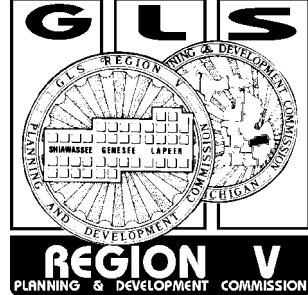
- Interstate/Freeway
- Arterials
- Collectors
- Local Roads
- Railroads
- Rivers and Streams
- Municipal Boundary

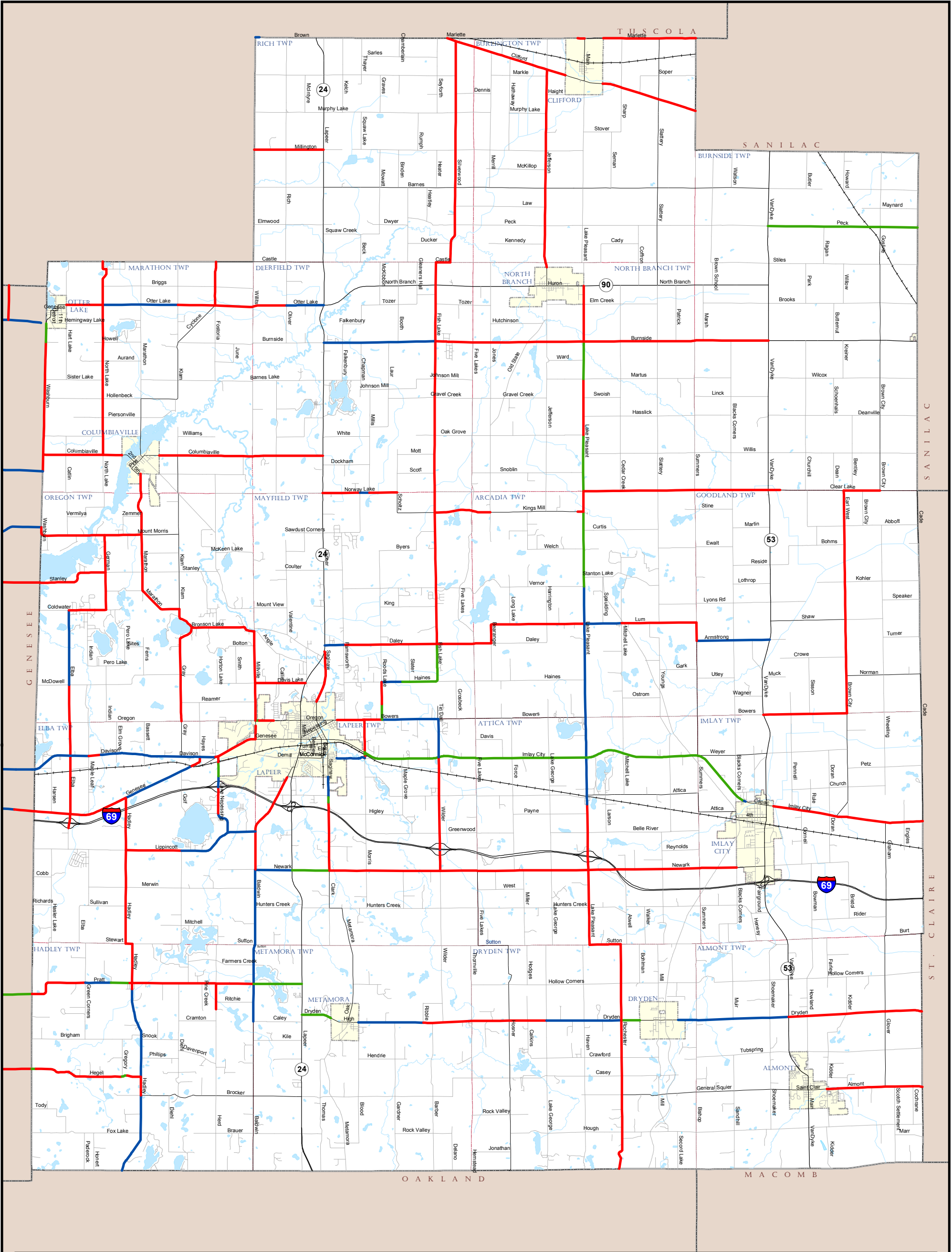
2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 132.51 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 287.08 lane miles)
- Rating 1-4 (Structural Improvements, 486.93 lane miles)



Sources: Michigan Geographic Framework V5a
Date: October 2014
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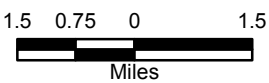
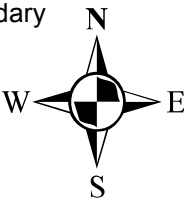


Lapeer County Road Commission Roads

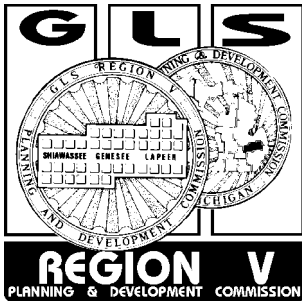
- Interstate/Freeway
- Arterials
- Collectors
- Local Roads
- Railroads
- Rivers and Streams
- Municipal Boundary

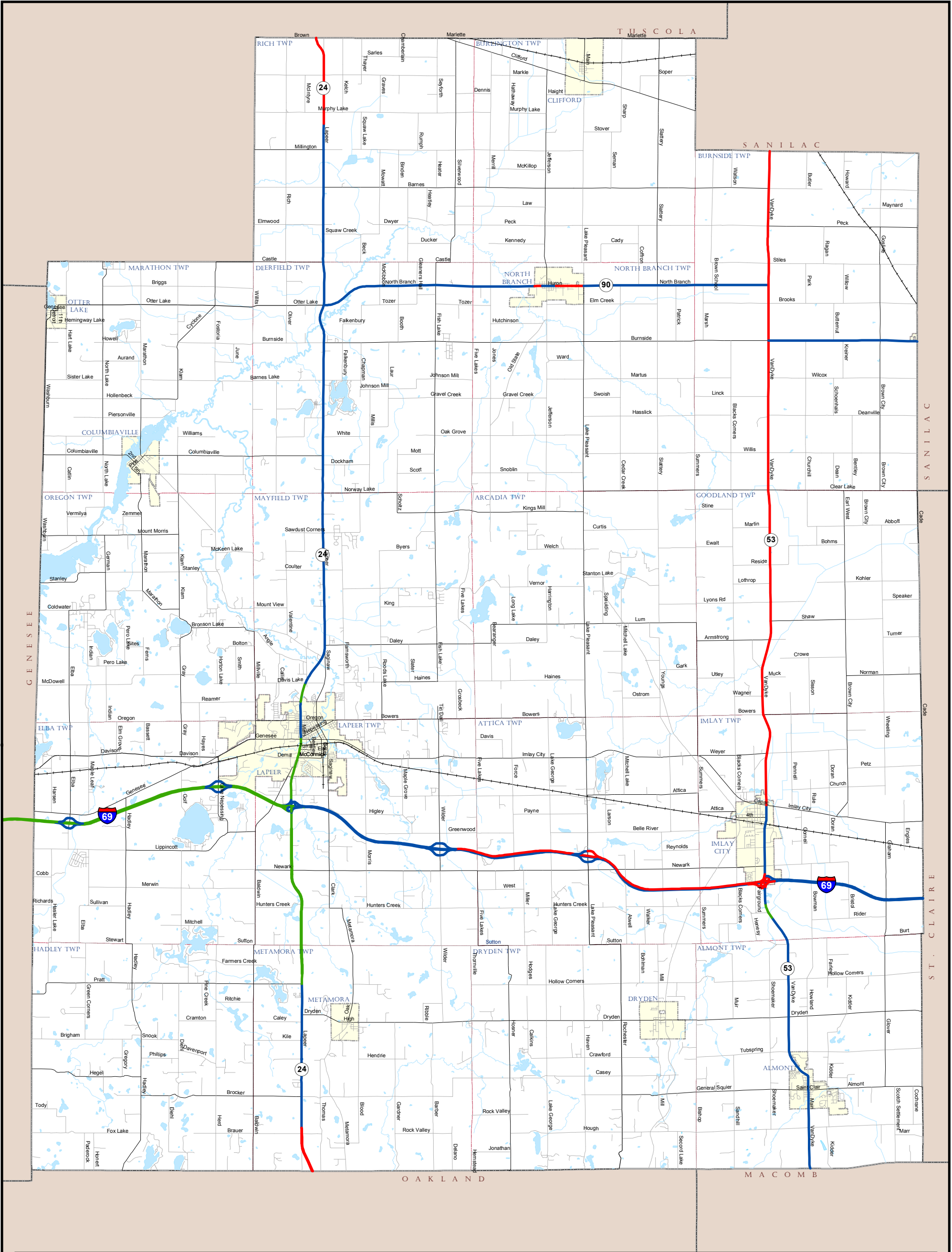
2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 54.66 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 99.38 lane miles)
- Rating 1-4 (Structural Improvements, 373.09 lane miles)



Sources: Michigan Geographic Framework Vs5a
Date: October 2014
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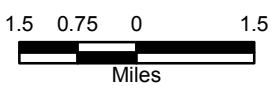
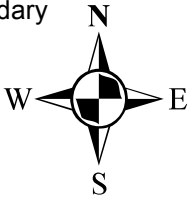


Lapeer County MDOT Roads

- Interstate/Freeway
- Arterials
- Collectors
- Local Roads
- Railroads
- Rivers and Streams
- Municipal Boundary

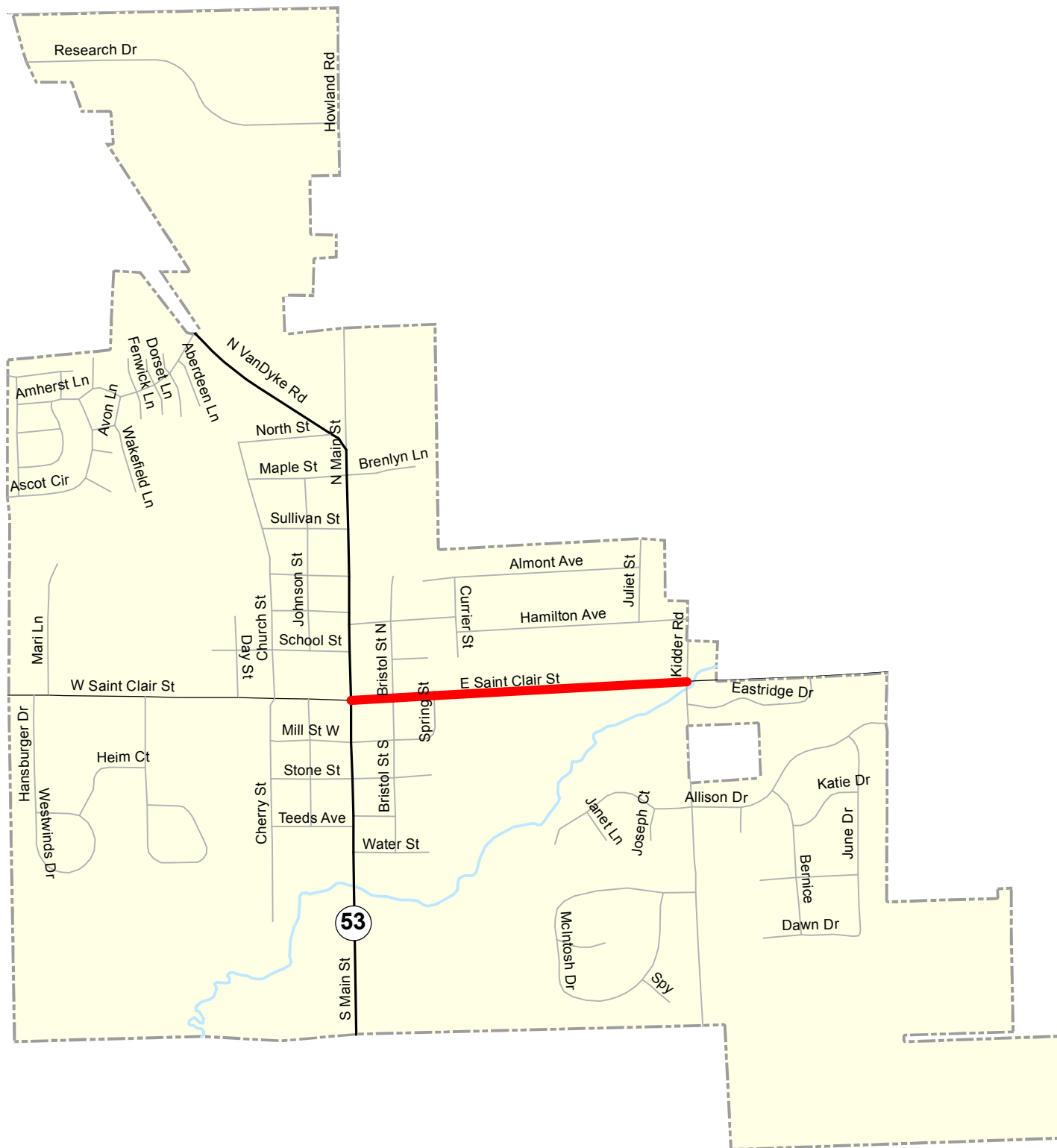
2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 73.64 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 169.28 lane miles)
- Rating 1-4 (Structural Improvements, 73.03 lane miles)



Sources: Michigan Geographic Framework Vs5a
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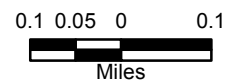
Village of Almont



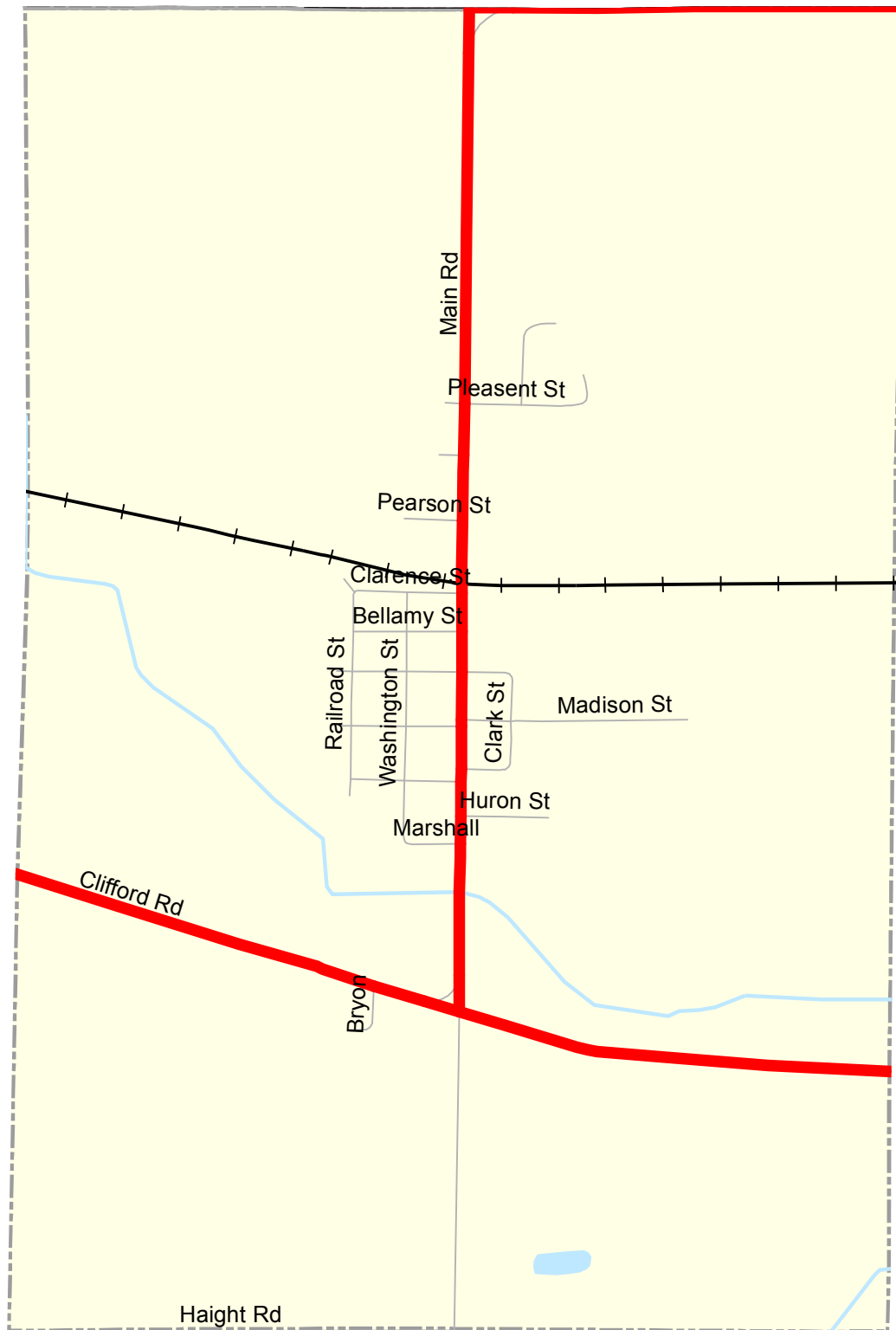
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| | Interstate/Freeway | | Collectors | | Railroads |
| | Arterials | | Local Roads | | Rivers and Streams |

2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 0.0 miles)
- Rating 5-7 (Capital Preventative Maintenance, 0.0 lane miles)
- Rating 1-4 (Structural Improvements, 1.06 lane miles)



Sources: Michigan Geographic Framework Vs5a
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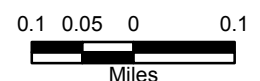
Village of Clifford



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| | Interstate/Freeway | | Collectors | | Railroads |
| | Arterials | | Local Roads | | Rivers and Streams |

2014 PASER Survey

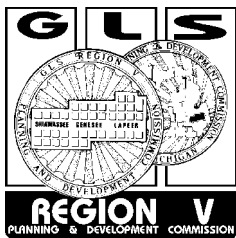
- Rating 8-10 (Routine Maintenance, 0.0 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 0.0 lane miles)
- Rating 1-4 (Structural Improvements, 5.35 lane miles)



Sources: Michigan Geographic Framework Vs5a
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Village of Columbiaville



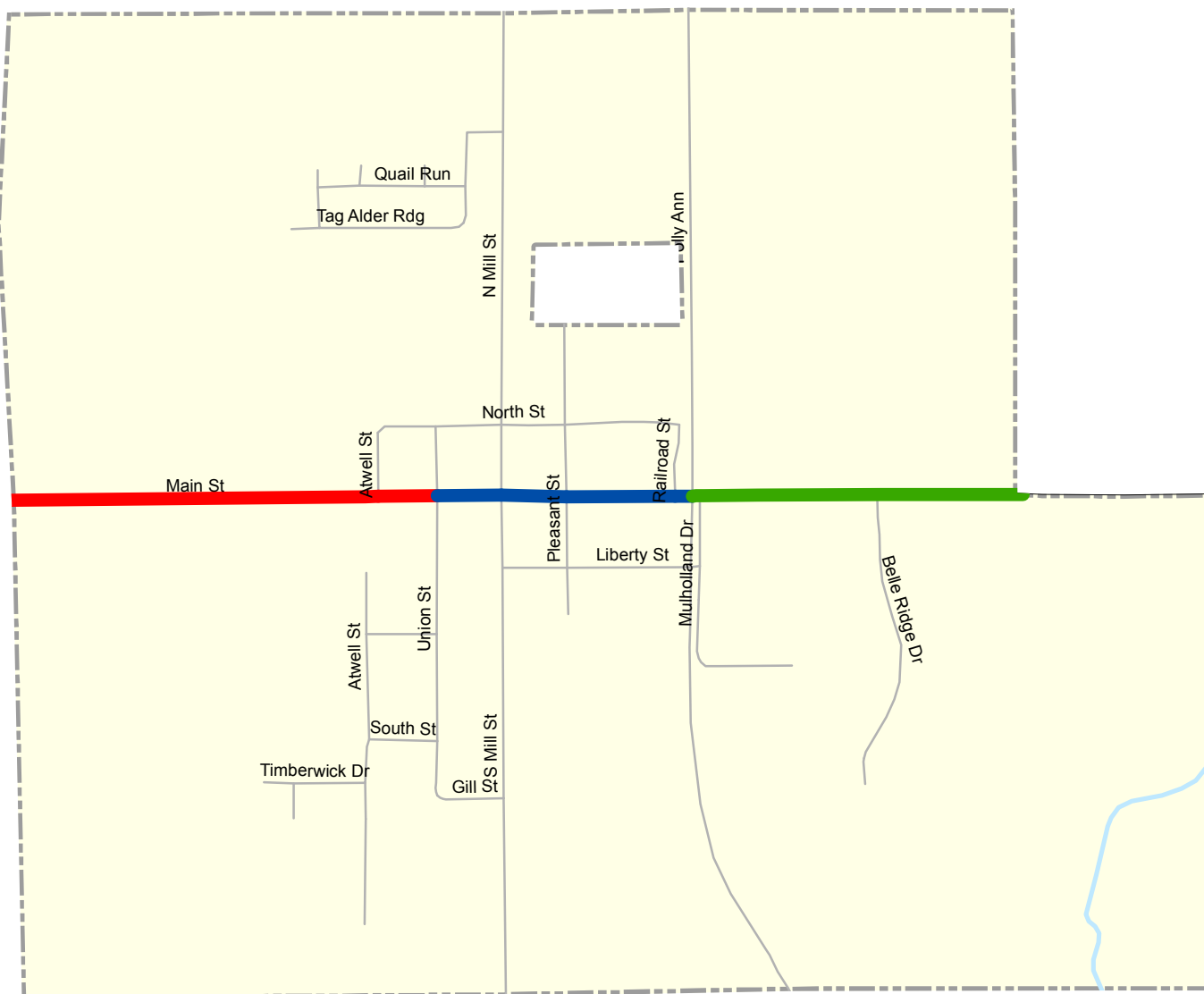
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| Interstate/Freeway | Collectors | Railroads |
| Arterials | Local Roads | Rivers and Streams |

2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 0.0 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 0.34 lane miles)
- Rating 1-4 (Structural Improvements, 2.98 lane miles)



Sources: Michigan Geographic Framework Vs5a
 Date: October 2014
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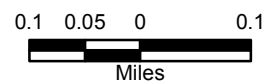
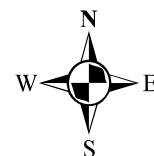
Village of Dryden



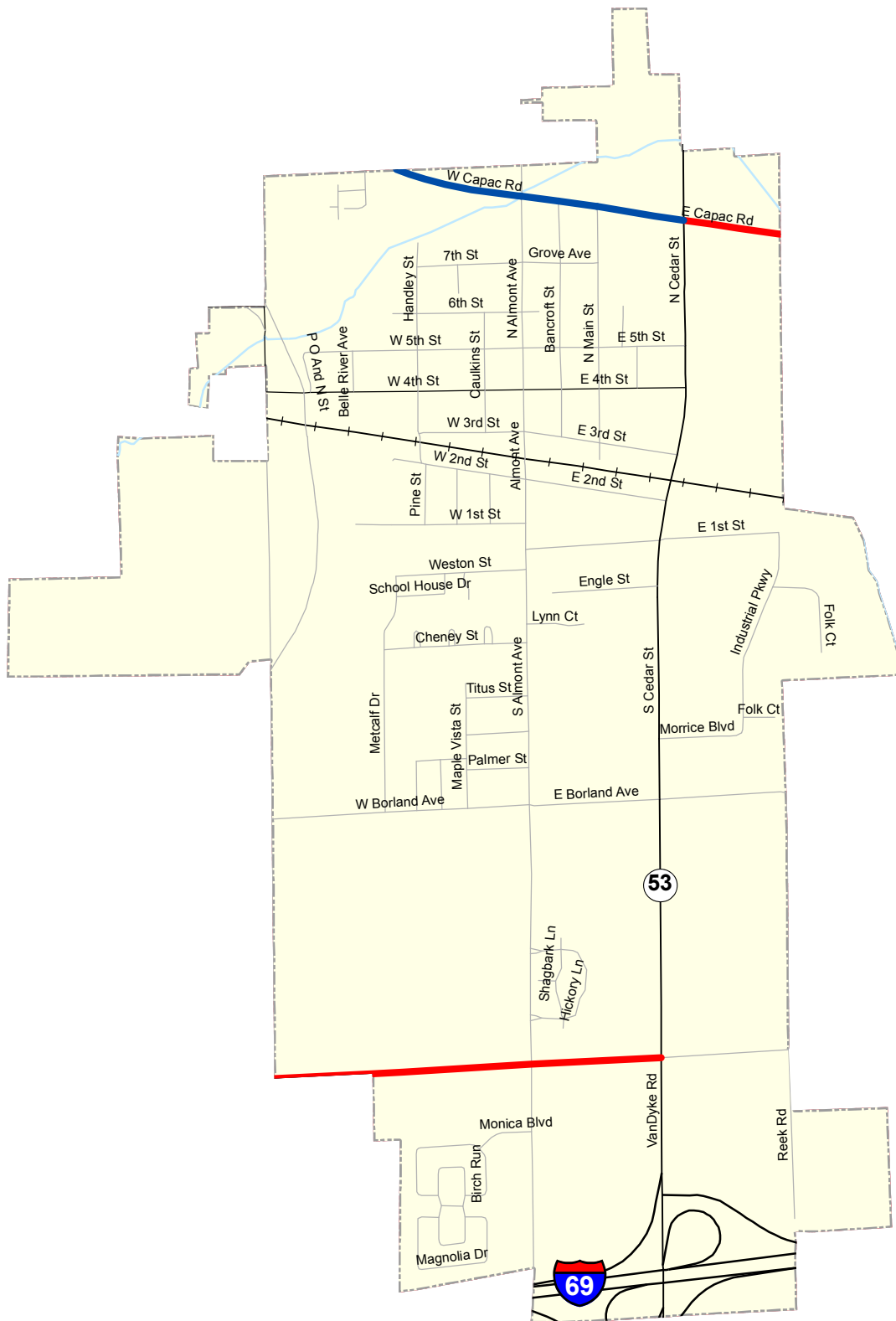
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| — Interstate/Freeway | — Collectors | — Railroads |
| — Arterials | — Local Roads | — Rivers and Streams |

2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 0.67 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 0.64 lane miles)
- Rating 1-4 (Structural Improvements, 0.86 lane miles)



Sources: Michigan Geographic Framework Vs5a
 Date: October 2014
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Imlay City

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| | Interstate/Freeway | | Collectors | | Railroads |
| | Arterials | | Local Roads | | Rivers and Streams |

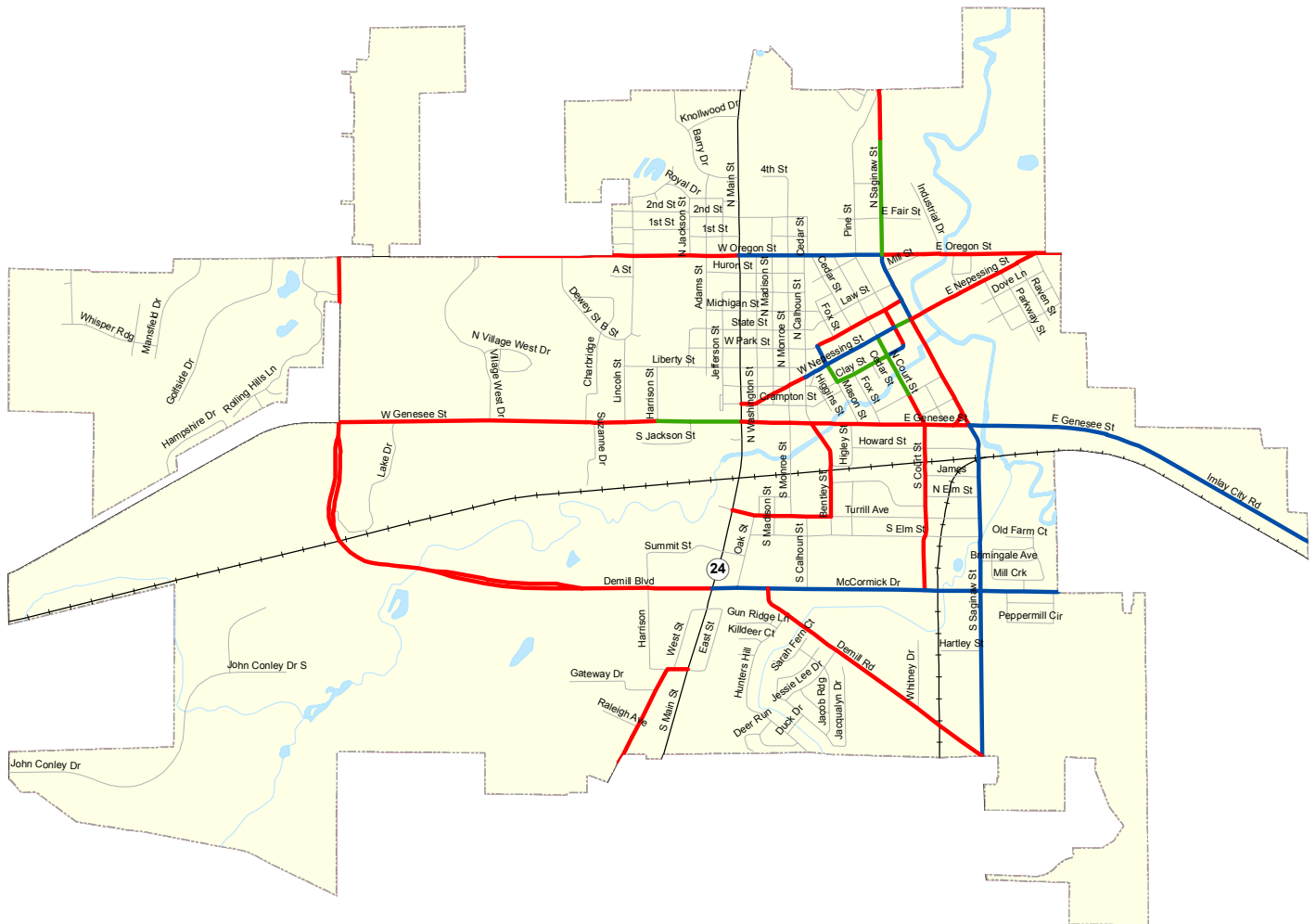
2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 0.0 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 1.77 miles)
- Rating 1-4 (Structural Improvements, 3.39 lane miles)



Sources: Michigan Geographic Framework Vs5A
 Date: October 2014
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City of Lapeer

- | | | |
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| Interstate/Freeway | Collectors | Railroads |
| Arterials | Local Roads | Rivers and Streams |

2014 PASER Survey

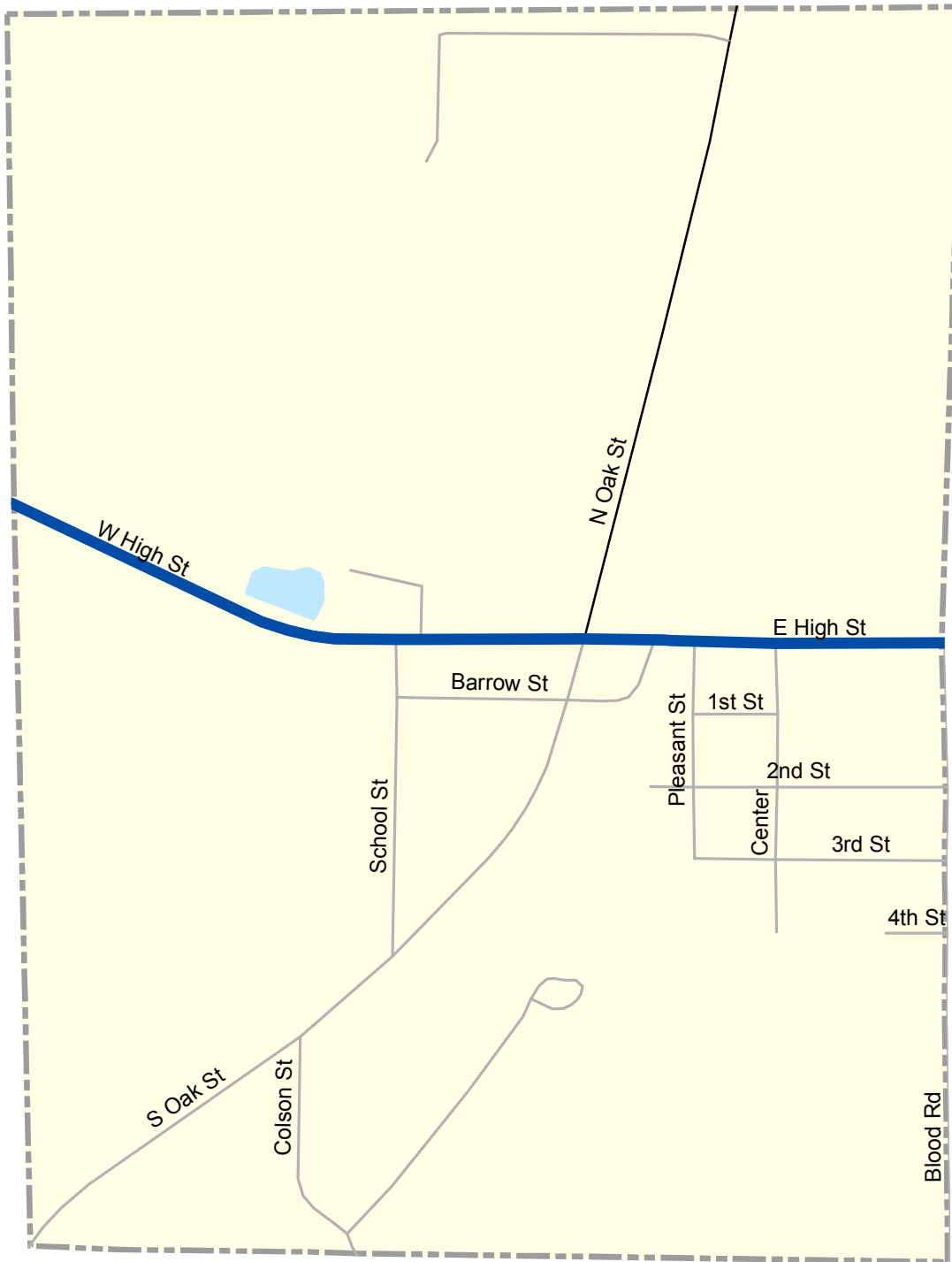
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- Rating 5-7 (Capital Preventative Maintenance, 13.14 lane miles)
- Rating 1-4 (Structural Improvements, 24.94 lane miles)



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Miles

Sources: Michigan Geographic Framework Vs5a
Date: October 2014
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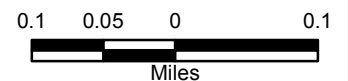
Village of Metamora



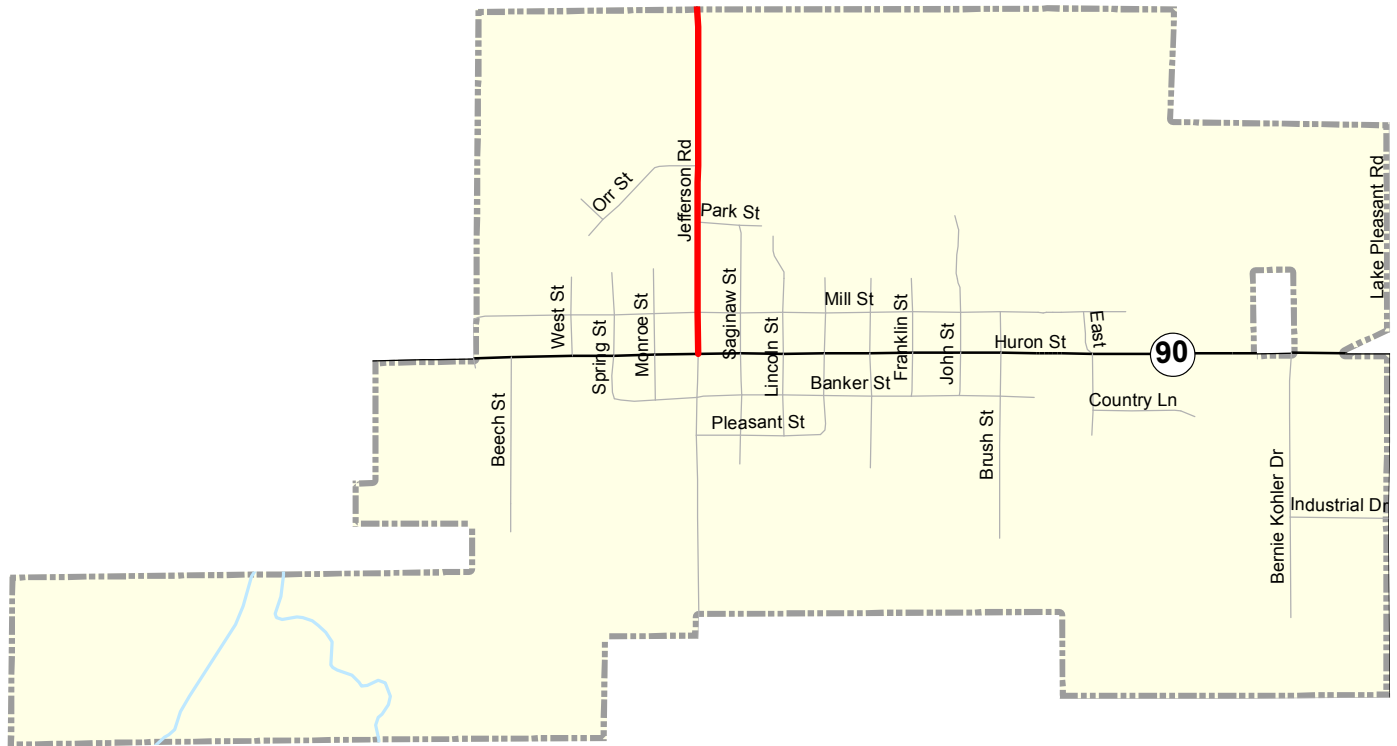
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|--|--------------------|--|-------------|--|--------------------|
| | Interstate/Freeway | | Collectors | | Railroads |
| | Arterials | | Local Roads | | Rivers and Streams |

2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 0.0 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 1.52 lane miles)
- Rating 1-4 (Structural Improvements, 0.0 lane miles)



Sources: Michigan Geographic Framework Vs5a
 Date: October 2014
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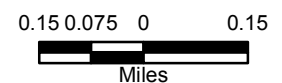
Village of North Branch



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| Interstate/Freeway | Collectors | Railroads |
| Arterials | Local Roads | Rivers and Streams |

2014 PASER Survey

- Rating 8-10 (Routine Maintenance, 0.0 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 0.0 lane miles)
- Rating 1-4 (Structural Improvements, 1.46 lane miles)



Sources: Michigan Geographic Framework Vs5a
 Date: October 2014
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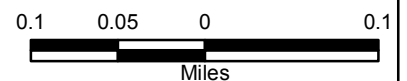
Village of Otter Lake



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|--------------------|-------------|--------------------|
| Interstate/Freeway | Collectors | Railroads |
| Arterials | Local Roads | Rivers and Streams |

2013 PASER Survey

- Rating 8-10 (Routine Maintenance, 0.43 lane miles)
- Rating 5-7 (Capital Preventative Maintenance, 1.0F lane miles)
- Rating 1-4 (Structural Improvements, 0.77 lane miles)



Sources: Michigan Geographic Framework Vs5a
Date: October 2014
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Concrete - PASER Rating System Manual

Rating system

Surface rating	Visible distress*	General condition/ treatment measures
10 Excellent	None.	New pavement. No maintenance required.
9 Excellent	Traffic wear in wheelpath. Slight map cracking or pop-outs.	Recent concrete overlay or joint rehabilitation. Like new condition. No maintenance required.
8 Very Good	Pop-outs, map cracking, or minor surface defects. Slight surface scaling. Partial loss of joint sealant. Isolated meander cracks, tight or well sealed. Isolated cracks at manholes, tight or well sealed.	More surface wear or slight defects. Little or no maintenance required.
7 Good	More extensive surface scaling. Some open joints. Isolated transverse or longitudinal cracks, tight or well sealed. Some manhole displacement and cracking. First utility patch, in good condition. First noticeable settlement or heave area.	First sign of transverse cracks (all tight); first utility patch. More extensive surface scaling. Seal open joints and other routine maintenance.
6 Good	Moderate scaling in several locations. A few isolated surface spalls. Shallow reinforcement causing cracks. Several corner cracks, tight or well sealed. Open (1/4" wide) longitudinal or transverse joints and more frequent transverse cracks (some open 1/4").	First signs of shallow reinforcement or corner cracking. Needs general joint and crack sealing. Scaled areas could be overlaid.
5 Fair	Moderate to severe polishing or scaling over 25% of the surface. High reinforcing steel causing surface spalling. Some joints and cracks have begun spalling. First signs of joint or crack faulting (1/4"). Multiple corner cracks with broken pieces. Moderate settlement or frost heave areas. Patching showing distress.	First signs of joint or crack spalling or faulting. Grind to repair surface defects. Some partial depth patching or joint repairs needed.
4 Fair	Severe polishing, scaling, map cracking, or spalling over 50% of the area. Joints and cracks show moderate to severe spalling. Pumping and faulting of joints (1/2") with fair ride. Several slabs have multiple transverse or meander cracks with moderate spalling. Spalled area broken into several pieces. Corner cracks with missing pieces or patches. Pavement blowups.	Needs some full depth repairs, grinding, and/or asphalt overlay to correct surface defects.
3 Poor	Most joints and cracks are open, with multiple parallel cracks, severe spalling, or faulting. D-cracking is evident. Severe faulting (1") giving poor ride. Extensive patching in fair to poor condition. Many transverse and meander cracks, open and severely spalled.	Needs extensive full depth patching plus some full slab replacement.
2 Very Poor	Extensive slab cracking, severely spalled and patched. Joints failed. Patching in very poor condition. Severe and extensive settlements or frost heaves.	Recycle and/or rebuild pavement.
1 Failed	Restricted speed. Extensive potholes. Almost total loss of pavement integrity.	Total reconstruction.

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Asphalt - PASER Rating System Manual

Rating system

Surface rating	Visible distress*	General condition/ treatment measures
10 Excellent	None.	New construction.
9 Excellent	None.	Recent overlay. Like new.
8 Very Good	No longitudinal cracks except reflection of paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight (open less than 1/4").	Recent sealcoat or new cold mix. Little or no maintenance required.
7 Good	Very slight or no raveling, surface shows some traffic wear. Longitudinal cracks (open 1/4") due to reflection or paving joints. Transverse cracks (open 1/4") spaced 10' or more apart, little or slight crack raveling. No patching or very few patches in excellent condition.	First signs of aging. Maintain with routine crack filling.
6 Good	Slight raveling (loss of fines) and traffic wear. Longitudinal cracks (open 1/4"–1/2"), some spaced less than 10'. First sign of block cracking. Slight to moderate flushing or polishing. Occasional patching in good condition.	Shows signs of aging. Sound structural condition. Could extend life with sealcoat.
5 Fair	Moderate to severe raveling (loss of fine and coarse aggregate). Longitudinal and transverse cracks (open 1/2") show first signs of slight raveling and secondary cracks. First signs of longitudinal cracks near pavement edge. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Some patching or edge wedging in good condition.	Surface aging. Sound structural condition. Needs sealcoat or thin non-structural overlay (less than 2")
4 Fair	Severe surface raveling. Multiple longitudinal and transverse cracking with slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (1/2" deep or less).	Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2" or more).
3 Poor	Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1" or 2" deep). Occasional potholes.	Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay.
2 Very Poor	Alligator cracking (over 25% of surface). Severe distortions (over 2" deep) Extensive patching in poor condition. Potholes.	Severe deterioration. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective.
1 Failed	Severe distress with extensive loss of surface integrity.	Failed. Needs total reconstruction.

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