Michigan 2045 Mobility

MDOT STATE LONG-RANGE TRANSPORTATION PLAN

MM2045 State Rail Plan Supplement

Final - November 5, 2021

MDOT Michigan Department of Transportation

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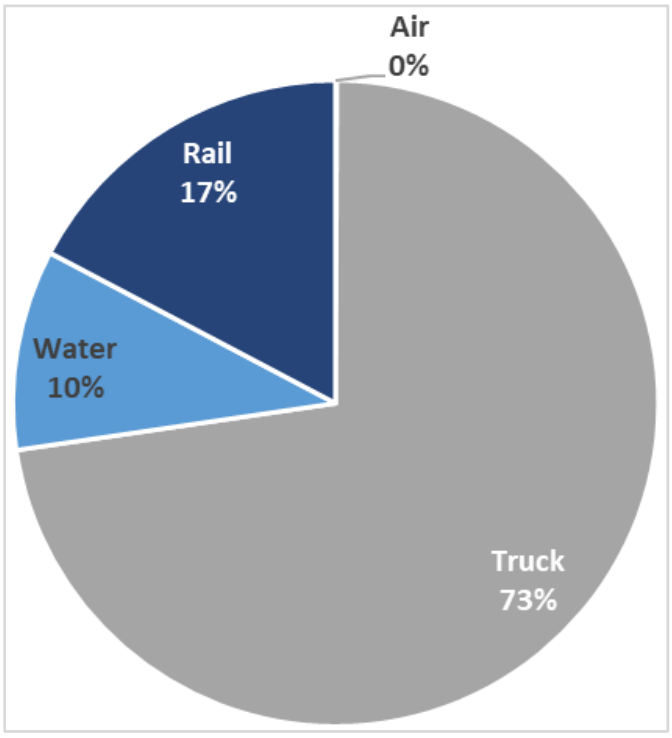
1. Role of Rail in Michigan's Transportation System

1.1 FREIGHT RAIL MODE SHARE

Freight railroads play a significant role in Michigan's economy. Freight railroads carry 17 percent of freight tonnage that originates, terminates, or travels within Michigan (Figure 1).

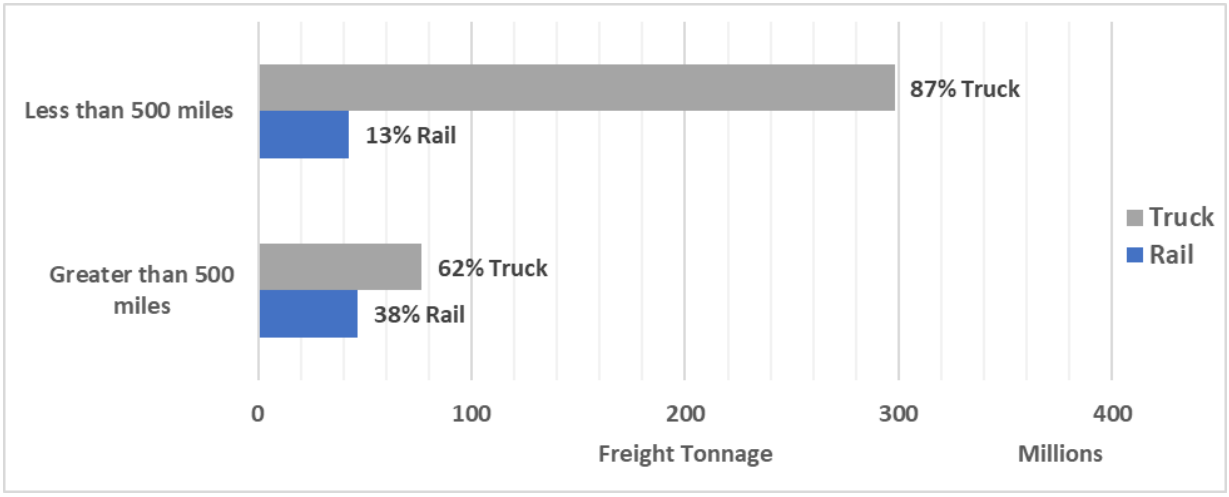
Figure 1. Michigan Rail Mode Share-Tons



Source: TRANSEARCH/Surface Transportation Board Waybill data; WSP analysis

Rail has a higher modal share for longer distance moves. As shown in Figure 2, rail carries 38 percent of combined truck and rail freight tonnage for shipments of more than 500 miles but carries only 13 percent of combined truck and rail freight tonnage for movements of less than 500 miles.

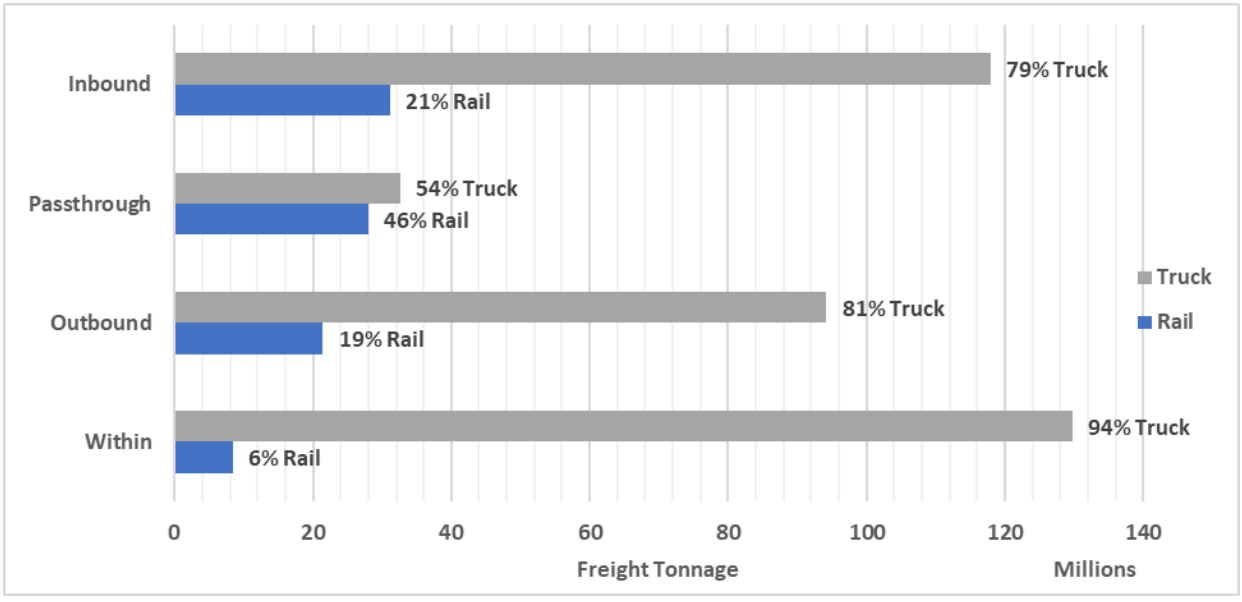
Figure 2. Michigan Rail Mode Share by Trip Length



Source: TRANSEARCH/Surface Transportation Board Waybill data; WSP analysis

Because rail is more heavily used for shipping long distances, rail has a relatively higher modal share for shipments to and from Michigan (inbound and outbound) and through the state (pass-through) than intrastate movements. Compared to trucking, approximately 20 percent of all freight to and from Michigan is shipped by rail, while only 6 percent of shipments within the state move by rail. Rail's highest modal share is for pass-through traffic, at 46 percent.

Figure 3. Michigan Rail Mode Share by Direction



Source: TRANSEARCH/Surface Transportation Board Waybill data; WSP analysis

Coal, metallic ores, and transportation equipment are the top three products moved by rail in Michigan, constituting a little more than 42 percent of total rail tonnage to/from/within/through the state. In the case of coal and metallic ores, the primary other mode used for carrying these commodities is water, although metallic ore shipments frequently move in combined rail and water shipments (thus appearing twice in Table 1). For most other commodities, trucking has the highest modal share and is the primary alternative to rail.

Table 1. Modal Shares by Commodities

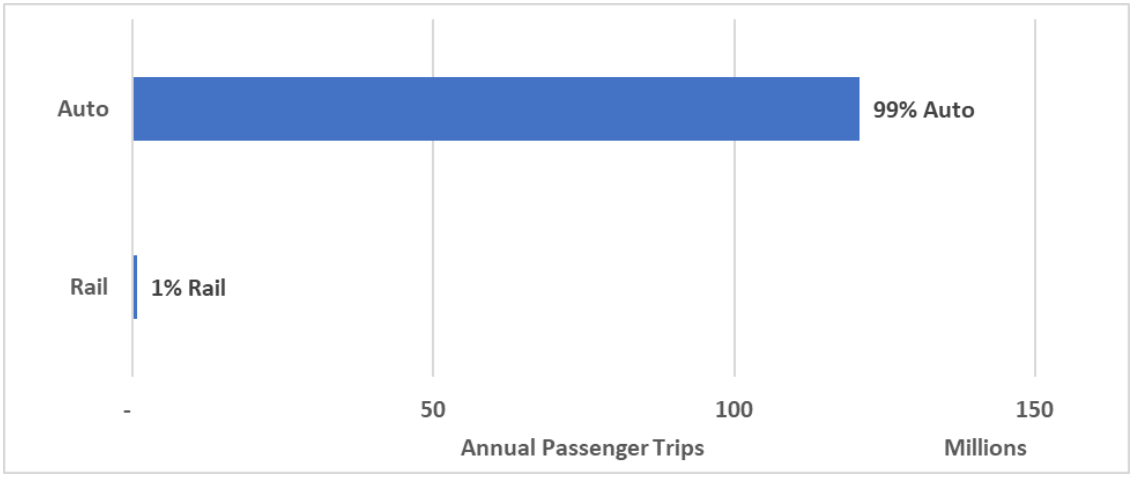
Commodity	Rail Tons (000s)	Modal Share by Tonnage			
		Air	Truck	Water	Rail
Coal	14,947	0%	0%	44%	56%
Chemicals or Allied Products	13,031	0%	51%	2%	46%
Transportation Equipment	9,636	0%	61%	0%	38%
Metallic Ores	8,841	0%	0%	56%	44%
Primary Metal Products	6,847	0%	73%	4%	23%
Petroleum or Coal Products	5,919	0%	80%	4%	16%
Misc. Mixed Shipments	5,038	0%	30%	0%	69%
Lumber or Wood Products	4,138	0%	74%	0%	26%
Clay, Concrete, Glass, or Stone	3,723	0%	77%	12%	11%
Pulp, Paper or Allied Products	3,498	0%	58%	0%	42%
Food or Kindred Products	3,316	0%	91%	0%	9%
Nonmetallic Minerals	3,226	0%	76%	20%	3%
Waste or Scrap Materials	3,028	0%	89%	0%	11%
Farm Products	2,686	0%	95%	0%	5%
Other	1,323	0%	98%	0%	2%
TOTAL	**89,197**	**0%**	**73%**	**10%**	**17%**

Source: TRANSEARCH/Surface Transportation Board Waybill data; WSP analysis

1.2 PASSENGER RAIL MODE SHARE

Most intercity passenger trips in Michigan are by automobile. The Michigan Statewide Travel Demand Model estimates that 121 million long-distance (defined as more than 50 miles) auto trips were taken in 2015. The same year, 742,051 people got on to or off of Amtrak trains in Michigan, resulting in an approximately a 0.6 percent mode share for passenger rail as shown in Figure 4.

Figure 4. Passenger Rail Modal Share for Long-Distance Trips (>50 miles)



Sources: Amtrak, Michigan Travel Demand Model

Certain origin-destination pairs have a higher rail modal share. The Amtrak service origin-destination pairs with the highest ridership to or from Michigan are between Chicago and stations in Ann Arbor, Kalamazoo, Lansing, and Detroit. As shown in Table 2, of these four, rail has the highest modal share for travel between Ann Arbor and Chicago, with nearly 11 percent of the trips between these two metropolitan areas being by rail.

Table 2. Rail Modal Share for Top Michigan Amtrak Markets, 2015

Commodity	Amtrak Ridership	Annual Auto Trips	Percentage Rail
Ann Arbor–Chicago	54,990	514,092	10.7%
Kalamazoo–Chicago	37,725	1,868,869	2.0%
Lansing–Chicago	26,736	738,411	3.6%
Detroit–Chicago	20,422	2,371,711	0.9%

Sources: Amtrak, Michigan Travel Demand Model

1.3 ACCESS TO PASSENGER RAIL IN MICHIGAN

Most residents of Michigan live within an hour's drive of an Amtrak station. Per the 2010 census, 5,032,402 Michigan residents live in a census block within a 10-mile radius of an Amtrak station, constituting 50.9 percent of the statewide population as shown in Table 3. This includes Michigan residents who are within 10 miles of an Amtrak station that is located outside the Michigan state border.

Table 3. Michigan Population Served by Intercity Passenger Rail

Radius	Population	Percentage of State Population
10 miles	5,032,402	50.9%
30 miles	8,112,576	82.1%

Source: 2010 U.S. census analysis; WSP

Per the same survey, 8,112,576 residents (82.1 percent) of the statewide population reside within 30 miles of an Amtrak station. This includes Michigan residents who are within 30 miles of an Amtrak station that is located outside the Michigan state border.

2. Institutional Structure of Rail Transportation

Public-sector organizations at both the state and local levels in Michigan provide planning and technical assistance, and financial support to rail development and operations.

2.1 MICHIGAN DEPARTMENT OF TRANSPORTATION

Authority to conduct rail planning in Michigan is assigned to the Michigan Department of Transportation (MDOT). For the purposes of the plan, MDOT will serve as the State Transportation Authority responsible for preparing, maintaining, coordinating, and administering the plan. MDOT will also serve as the State Rail Plan Approval Authority, which will have responsibility to review and approve the plan.

Nearly all statewide rail functions are contained within the MDOT Office of Rail, which will have primary responsibility for the portions of Michigan Mobility 2045 (MM2045) that fulfill Federal Railroad Administration (FRA)/Passenger Rail Investment and Improvement Act of 2008 (PRIIA) requirements for a State Rail Plan. The Office of Rail is responsible for ensuring that Michigan's rail system meets the economic needs of the state and is safe for the motoring public, rail passengers and railroad employees. Within the office, there are regulatory and program functions related to passenger and freight rail. The Office of Rail works directly with railroad companies, program applicants, or road authorities to perform all rail functions (summarized in Figure 5).

- **Intercity passenger rail operations**. The Office of Rail provides capital and operating assistance, and technical support for Michigan's passenger rail system. The department sponsors the following Amtrak Michigan services: the Wolverine, Blue Water, and Pere Marquette lines, which collectively serve 22 stations in the state. MDOT administers capital and maintenance activities on the state-owned section of track used for intercity service between Dearborn and Kalamazoo.
- **Crossing and rail-worker safety regulation, along with state safety oversight of rail fixed-guideway systems**. The Office of Rail has regulatory responsibilities to assess the physical condition and safety needs of the approximately 4,800 public at-grade crossings in the state. The Office of Rail also has responsibility to ensure compliance with railroad safety regulations regarding railroad employees. These relate to minimum clearances to ensure safe passage for rail workers on railroad rights of way and minimum standards for sanitation and shelter. In addition, the Office of Rail has regulatory responsibilities for two rail fixed-guideway systems in southeast Michigan: the Detroit People Mover and the M-1 QLine.

Figure 5. Institutional Structure of Rail Transportation

MDOT OFFICE OF RAIL

- Intercity passenger rail operations
- Crossing and rail-worker safety
- Crossing safety funding programs on local/state roads
- Grade separations involving state-owned roads and/or tracks
- State-owned rail line management
- Rail-related economic development programs
- International border crossings

MDOT

OFFICE OF PASSENGER TRANSPORTATION
- Interface of passenger rail with intercity bus and local transit
- Oversight of fixed-guideway systems

BUREAU OF TRANSPORTATION PLANNING
- Statewide planning and coordination with regional and local agencies
- Freight coordination

BUREAU OF BRIDGES AND STRUCTURES
- Grade separation coordination
- Bridge inspections

BUREAU OF FIELD SERVICES, REGIONS, AND TRANSPORTATION SERVICE CENTERS
- Construction-related activities

OFFICE OF ECONOMIC DEVELOPMENT
- Economic development coordination

BUREAU OF DEVELOPMENT
- Real estate and environmental expertise

OTHER STATE AGENCIES

MICHIGAN DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT
- Economic development coordination

MICHIGAN ECONOMIC DEVELOPMENT CORPORATION
- Economic development coordination

OTHER PLANNING PARTNERS

PROVINCE OF ONTARIO AND NEIGHBORING STATES
- Local/Regional Rail Planning for passenger rail and grade separation projects

REGIONAL PLANNING COUNCILS/ METROPOLITAN PLANNING ORGANIZATIONS
- Local/Regional Rail Planning for passenger rail and grade separation projects

LOCAL ROAD AUTHORITIES
- Local/Regional Rail Planning for passenger rail and grade separation projects

PORT AUTHORITIES
- On-Site Rail Planning

- **Crossing funding programs on local roads and state trunklines**. The MDOT Office of Rail administers the federal Railway-Highway Crossings (Section 130) Program through the Local Grade Crossing Program (LGCP) and the Trunkline Grade Crossing Program (TGCP). The LGCP provides funding to assist local road authorities and railroad companies with the development and implementation of projects that improve motorist safety at public highway-railroad crossings, while the TGCP does the same for crossings on roadways under MDOT jurisdiction. The LGCP also provides cash incentives to road authorities closing streets at crossings, and both programs provide funding toward track realignment projects that eliminate public grade crossings. The Local Crossing Surface Program improves crossing surfaces on roadways under county, city, or village jurisdiction.
- **Grade separations involving trunkline highways and/or state-owned tracks**. The Office of Rail coordinates with railroads, planning agencies, and MDOT highway functions in support of structures projects at existing grade separated locations.
- **State-owned rail line management.** The Office of Rail manages the 665 miles of state-owned rail lines in Michigan. MDOT serves as the property owner and contracts the responsibility for maintenance and operations to private rail operators. Through the Office of Rail Capital Program, MDOT funds capital projects on state-owned rail lines primarily to maintain rail lines in a state of good repair, with input from the operators as it relates to their business need. Operators are otherwise responsible for spot and capital maintenance, with one exception being the Michigan Line. For the state-owned Kalamazoo-to-Dearborn Michigan Line, MDOT is committed to funding all maintenance and capital work as a condition of the federal grants that were obtained to acquire and improve the corridor.
- **Rail-related economic development programs**. The Office of Rail has two programs that were established to help preserve and provide access to Michigan's rail system. The Michigan Rail Loan Assistance Program provides interest-free loans to railroads for infrastructure preservation and improvements. The Freight Economic Development Program assists new or expanding rail customers with up to 50 percent of the costs associated with rail infrastructure (like rail spurs) on their property. Projects must have associated job creation and rail traffic generation opportunities.
- **International border crossings**. The Office of Rail represents MDOT on bi-national and tri-national groups relevant to railroad transportation and coordinates with Canadian authorities on rail cross-border projects.

The Office of Rail coordinates with other areas within MDOT as well:

- The **Office of Passenger Transportation** administers MDOT's passenger transportation programs, including intercity bus services that provide connections to Amtrak stations. The Office of Rail coordinates with the Office of Passenger Transportation on all mixed-use stations in the state that serve passenger rail, as well as intercity bus and local transit.

- The **Bureau of Transportation Planning** conducts statewide multimodal planning, coordinates with metropolitan planning organizations (MPOs), and collects and analyzes transportation data. The Office of Rail participates in MPO coordination and uses the bureau's transportation data. The Office of Rail provides input to multimodal statewide plans, such as MM2045.
- Other areas within MDOT that play an intermittent role relative to passenger and freight rail include the **Bureau of Development** for real estate and environmental expertise; the **Bureau of Field Services**, **Regions**, and **Transportation Service Centers** for construction-related activities; the **Bureau of Bridges and Structures** for grade-separation coordination; and the **Office of Economic Development** for some grant coordination.

2.2 OTHER STATE AGENCIES

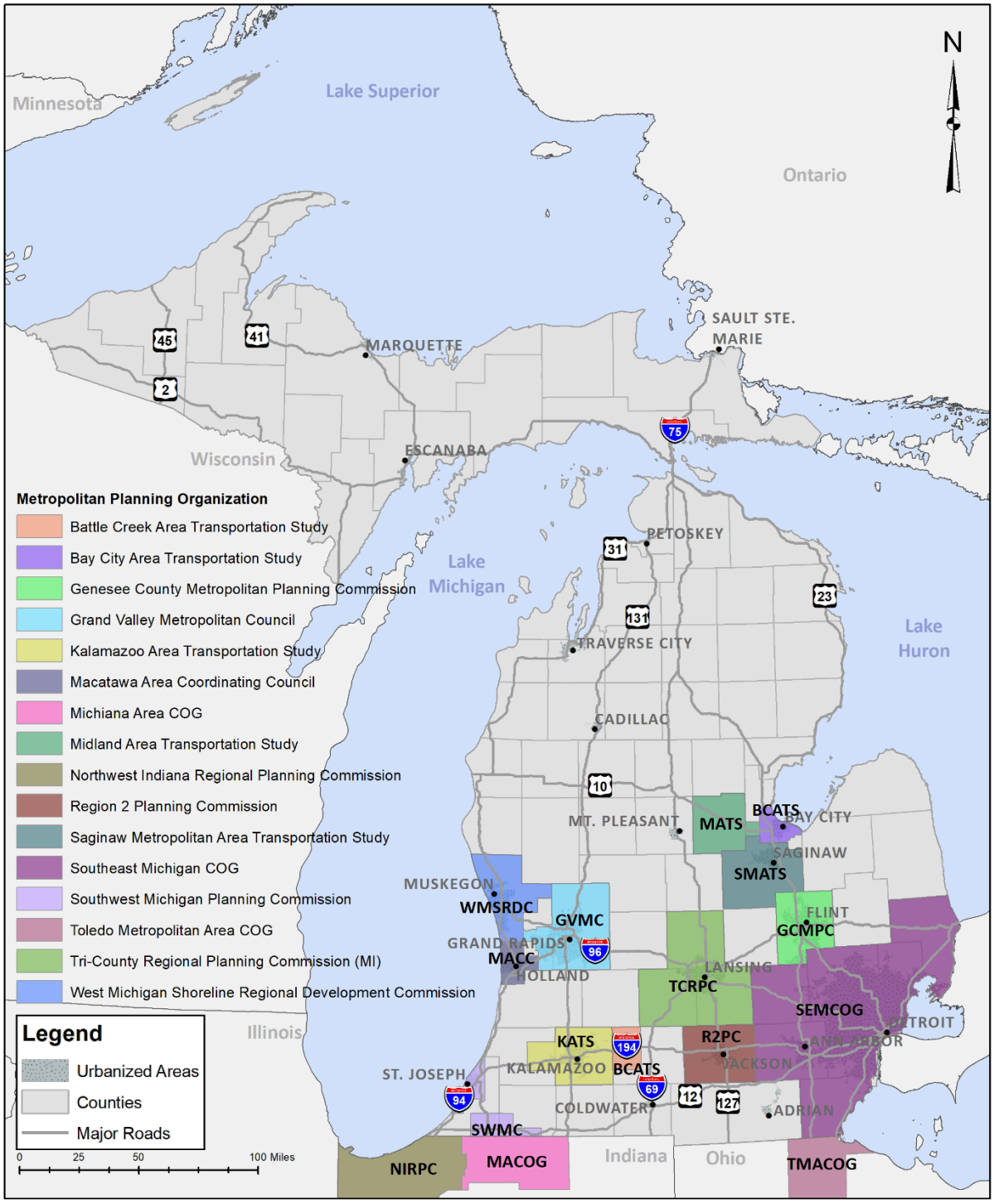
The Office of Rail coordinates with other agencies to support rail as well:

- The **Michigan Economic Development Corp. (MEDC)** markets Michigan as a place to do business, assists businesses in their growth strategies, and fosters the growth of vibrant communities across the state. Where rail infrastructure supports economic development projects, MEDC coordinates with the Office of Rail to support rail development and incorporate rail as an asset in its marketing activities.
- Among the functions of the **Michigan Department of Agriculture and Rural Development** is to cultivate and expand new economic opportunities for the food and agricultural sector. Where rail can help to support these economic opportunities, the agency coordinates with the Office of Rail.

2.3 METROPOLITAN PLANNING ORGANIZATIONS

Federal transportation legislation requires that an MPO be designated for each urbanized area with a population of more than 50,000 people to carry out metropolitan transportation planning functions as a condition of federal aid. Michigan has 13 U.S. Department of Transportation (USDOT)-designated MPOs. In addition to the 13 MPOs wholly within the state, the transportation planning area of the Toledo Metropolitan Area Council of Governments in Ohio extends into Monroe County, Michigan. Freight rail, passenger rail, and highway- and rail-crossing issues and improvements can figure into MPO planning efforts. Figure 6 displays a map of Michigan MPOs.

Figure 6. Michigan Metropolitan Planning Organizations



Source: Federal Highway Administration

2.4 PLANNING REGIONS

Within Michigan are 14 planning regions, also known as regional councils. These were established in the 1960s to coordinate planning efforts across local jurisdictions. All regional councils are involved, in partnership with MDOT and local road agencies, in multi-county regional transportation planning, potentially including rail. Some regional councils also serve as MPOs, while others do not serve this function either because they represent a nonmetropolitan region or a metropolitan area within the region is served by a separate MPO organization. Table 4 shows the regional planning commissions.

Table 4. Regional Planning Commissions

Acronym	Name	Geography	Also MPO?
SEMCOG	Southeast Michigan Council of Governments	Seven-county area around Metro Detroit	Yes
R2PC	Region II Planning Commission	Hillsdale, Jackson, and Lenawee counties	Yes
SCMPC	Southcentral Michigan Planning Council	Branch, Calhoun, Kalamazoo, and St. Joseph counties	No
SWMPC	Southwest Michigan Planning Commission	Berrien, Cass, and Van Buren counties	Yes
GLSPDC	GLS Region V Planning and Development Commission	Genesee, Shiawassee, and Lapeer counties	No
TCRPC	Tri-County Regional Planning Commission	Clinton, Eaton, and Ingham counties	Yes
EMCOG	Eastern Michigan Council of Governments	Fourteen-county region and one sovereign Native American tribe in east Michigan	No
WMRPC	West Michigan Regional Planning Commission	Eight-county region in west Michigan	No
NEMCOG	Northeast Michigan Council of Governments	Eight-county region in northeast Michigan	No
Networks NW	Networks Northwest	Ten-county region in northwest Michigan	No
EUPRPDC	Eastern Upper Peninsula Regional Planning and Development Commission	Mackinac, Chippewa, and Luce counties	No
CUPPAD	Central Upper Peninsula Planning and Development Regional Commission	Six-county region in the central portion of the Upper Peninsula	No
WUPPDR	Western Upper Peninsula Planning and Development Regional Commission	Six counties on the western side of the Upper Peninsula	No
WMSRDC	West Michigan Shoreline Regional Development Commission	Lake, Mason, Muskegon, Newaygo, and Oceana counties	Yes

Source: Michigan Association of Regions

2.5 REGIONAL AND LOCAL ECONOMIC DEVELOPMENT AGENCIES

Within Michigan are numerous local and regional economic development agencies. Some of these agencies are formed through interlocal partnerships in which local public agencies establish a formal agreement to jointly exercise powers and form an agreement to pursue common goals. Some economic development organizations are quasi-public, quasi-private agencies that can serve in a coordinating role, acting as go-betweens for public transportation agencies and private businesses and advocating for transportation improvements that will support and attract businesses to the state. Other organizations such as chambers of commerce are strictly private and represent the interests of local businesses. Local and regional economic development agencies have been known to help identify rail needs, seek solutions to these needs, and advocate for adequate funding to address these needs.

2.6 OTHER LOCAL AND MUNICIPAL SUPPORT FOR RAIL

County and municipal governments can also support rail improvements directly or through modal connections. As an example, the Detroit Wayne County Port Authority was organized under the 1978 Port Authorities Act by the Michigan Legislature and has the authority to manage port-owned properties as well as general oversight of Detroit's port district. Freight improvements within the port district could include rail. Other counties and municipalities play a role in ports and multimodal functions as well.

3. Michigan Freight Rail System

3.1 MICHIGAN'S RAILROADS

Figure 7 is a map of the Michigan rail network.

Figure 7. Michigan Railroad Network

Source: MDOT

3.1.1 Class I Railroads in Michigan

Four Class I railroads operate in Michigan, as shown in Table 5.

A description of each rail line operated by Class I railroads in Michigan can be found in Appendix B.

Table 5. Class I Railroads

Class I Railroads	Miles Leased	Miles Owned, Operated	Miles Owned, Not Operated	Total Miles Operated	Trackage Rights
Canadian National Railway	3	868		871	
Canadian Pacific Railway		1		1	80
CSX Transportation, Inc.		363	211	363	143
Norfolk Southern Railway		115	157	115	372
TOTAL	**3**	**1,347**	**368**	**1,350**	**595**

Source: Railroad R-1 Annual Reports Files with the Surface Transportation Board

3.1.2 Short-Line (Class III) Rail Lines of Michigan

Michigan has 23 short-line railroads (Table 6) that provide rail service to locations that cannot be served profitably by the Class I railroads.

Detailed descriptions of the local railroads are in Appendix B.

Table 6. Regional and Local Railroads

Railroad	Miles Leased	Miles Owned, Operated	Miles Owned, Not Operated	Total Miles Operated Ex Trackage Right	Trackage Rights
Adrian and Blissfield		21		21	
Ann Arbor Railroad		61		61	
Charlotte Southern Railroad		3		3	
Conrail, Inc.		96		96	
Coopersville and Marne Railway		14		14	
Delray Connecting Railroad		1		1	
Detroit Connecting Railroad		2		2	
Escanaba and Lake Superior Railroad Co.		183		183	60
Grand Elk Railroad	103			103	7
Grand Rapids Eastern Railroad		22		22	
Great Lakes Central Railroad	400	20		420	
Huron and Eastern Railway Co.	44	271	2	313	
Indiana and Ohio Railway Co.		21		21	
Indiana Northeastern Railroad Co.	50	2		52	
Jackson and Lansing Railroad	47			47	

Railroad	Miles Leased	Miles Owned, Operated	Miles Owned, Not Operated	Total Miles Operated Ex Trackage Right	Trackage Rights
Lake State Railway Co.	187	191		378	12
Lake Superior and Ishpeming Railroad		24			
Lapeer Industrial Railroad		1		2	
Marquette Rail, LLC	129			129	
Michigan Shore Railroad	50	4		54	
Michigan Southern Railroad		21		21	
Mid-Michigan Railroad, Inc.		30		30	
Mineral Range Railroad / Mineral Range, Inc.		17		17	1
West Michigan Railroad		14		14	
TOTAL	**1,010**	**1,019**	**2**	**2,004**	**80**

Sources: Railroad survey, carrier websites, AAR state profile

3.1.3 State of Michigan-Owned Freight Rail Lines

MDOT owns four freight rail lines (530 miles) that it leases to four railroad operators: (1) Great Lakes Central Railroad, (2) Huron and Eastern Railway, (3) Indiana Northeastern Railroad, and (4) Lake State Railway, shown in Figure 8.

Figure 8. State-Owned Rail Lines

3.2 MICHIGAN'S RAIL NETWORK

Figure 9 shows rail line densities in Michigan and the surrounding region. The highest density rail lines in Michigan are the lines south of Detroit, which connect the Detroit area with other parts or the U.S. The Canadian National Railway (Canadian National) mainline that crosses Michigan between western Indiana and Port Huron also has high density since it is the primary rail line that connects Chicago with eastern Canada.

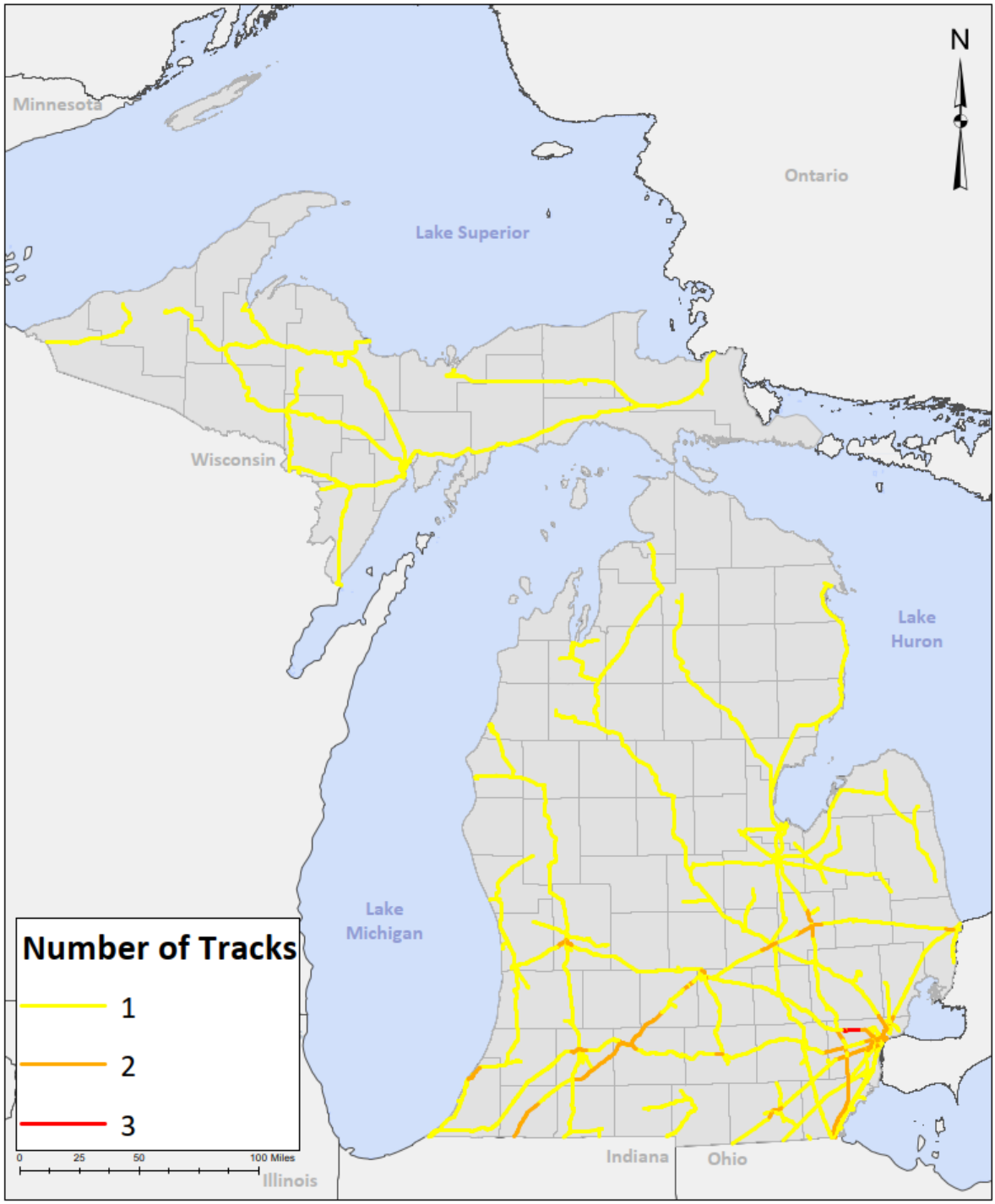
Figure 9. Michigan Rail Line Densities

Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

3.2.1 Michigan Rail Line Capacities

Most rail lines in Michigan consist of only a single track. However, the state's high-density rail lines have two tracks, and for short, selected segments, three tracks, as shown on Figure 10. In Michigan, there are an estimated 636 miles of double track and 12 miles of triple track, while the remaining 2,919 miles are single track.

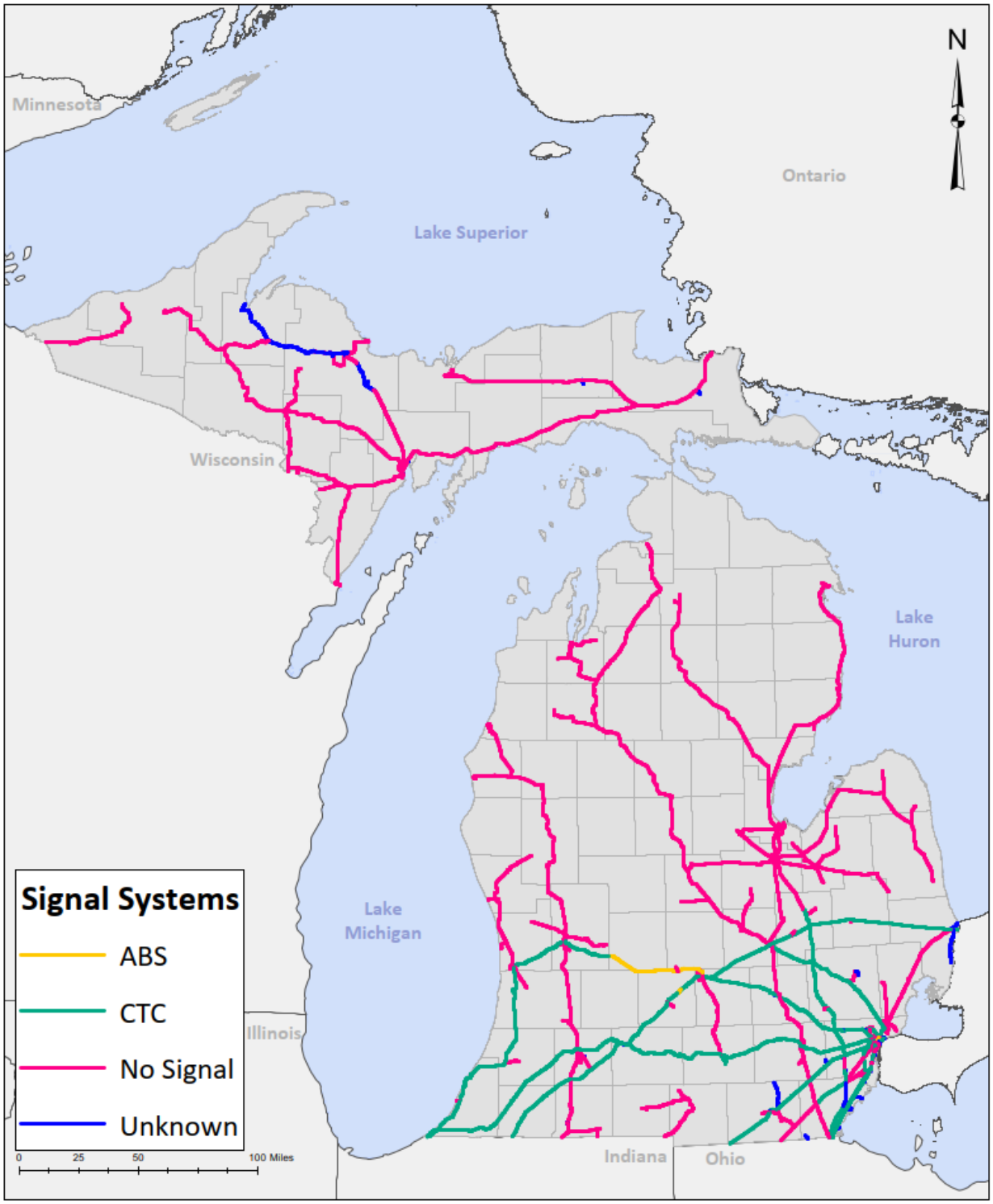
Figure 10. Michigan Railroad Network Number of Tracks



Sources: Survey of Railroads, NTAD

Figure 11 shows the signal systems of lines in Michigan. Centralized traffic control (CTC) and automatic block signals (ABS) are used on the high-traffic mainlines in the south part of the state. The lower-density rail lines are not signalized. CTC controls 1,332 miles of track in Michigan, ABS controls 153 miles, and the remaining miles are unsignalized.

Figure 11. Michigan Railroad Network Signal Systems



3.2.2 Limitations of Michigan Rail Lines

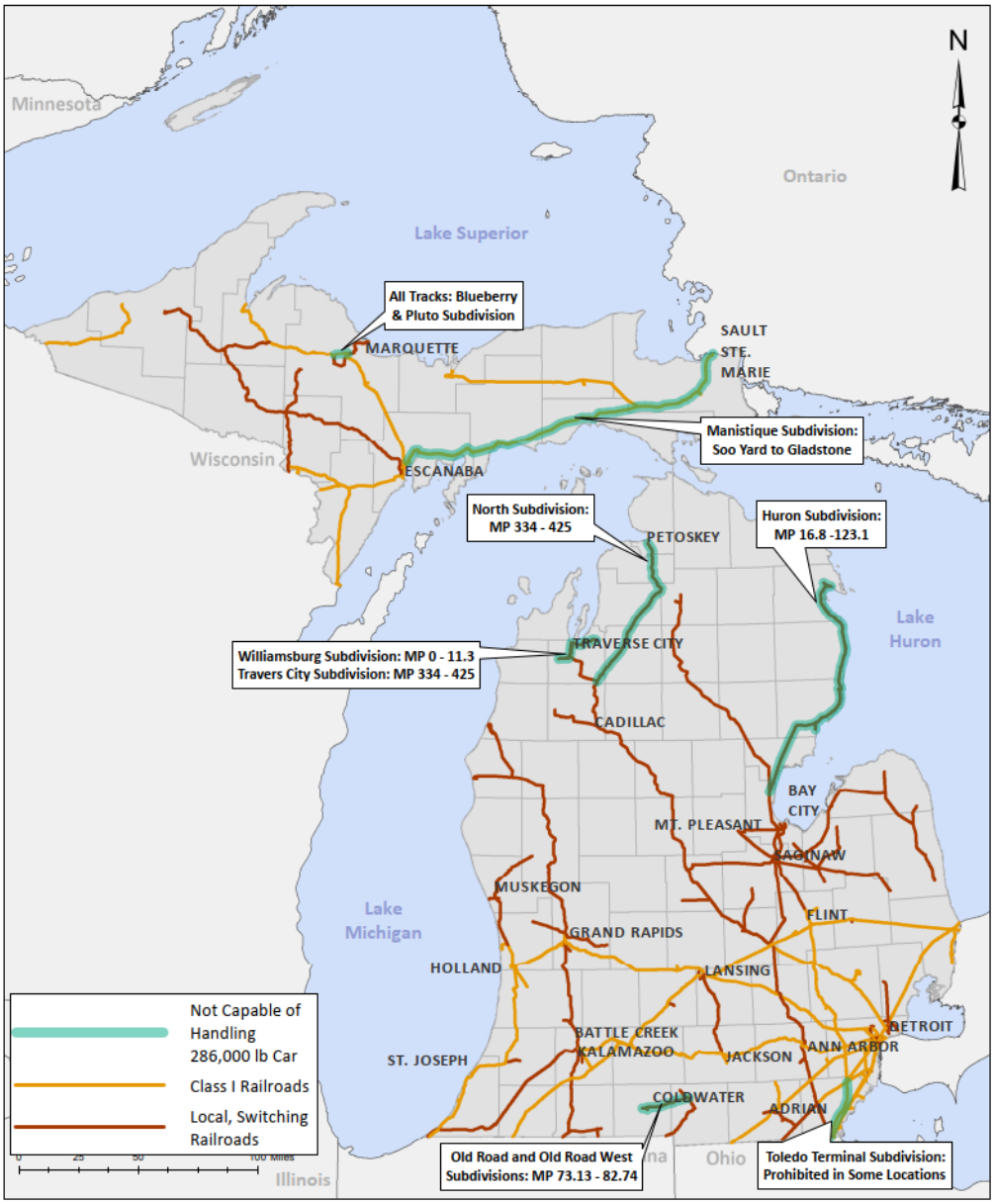
3.2.2.1 Vertical Clearance Restrictions

The Canadian Pacific Railway's Detroit River Rail Tunnel, which links Detroit with Windsor, Ontario, has restricted clearances. The tunnel does not allow "high cube" double-stack train operations.

3.2.2.2 Car Weight Limitations

The current maximum weight standard gross weight on rail for railcars is 286,000 pounds. Figure 12 shows the maximum weights on Michigan's freight network.

Figure 12. Michigan Rail Line Maximum Weights

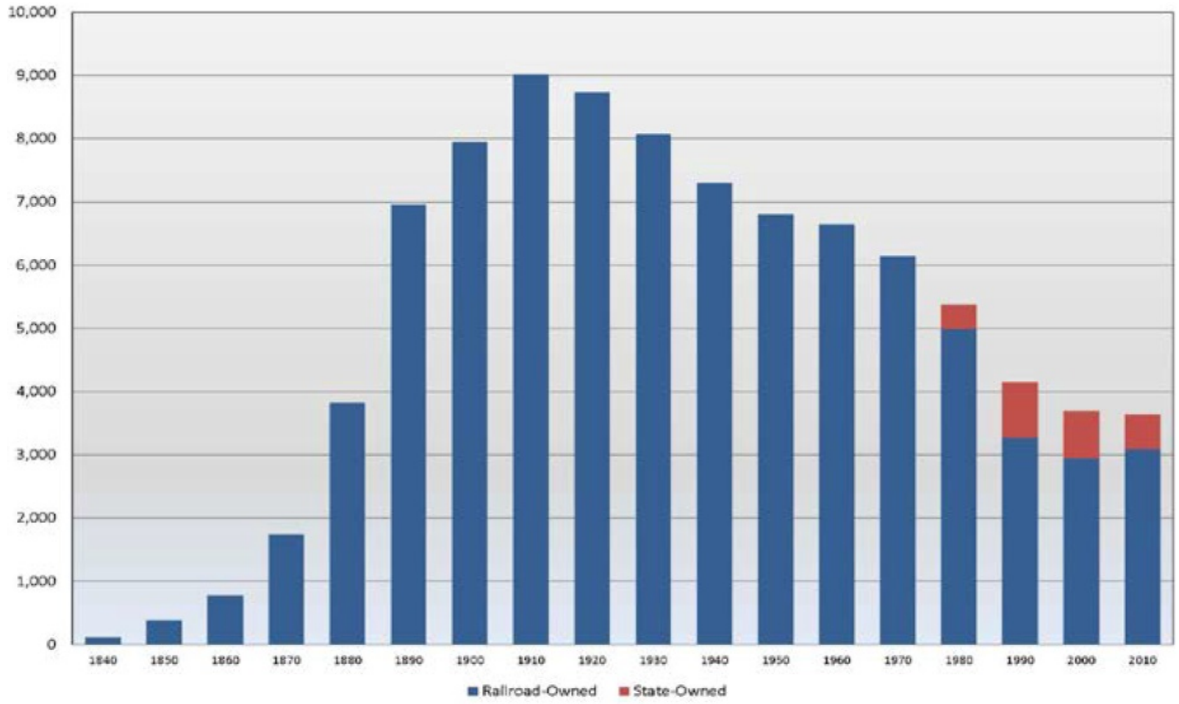


Source: Survey of Railroads, carrier websites

3.2.3 Inactive and Abandoned Rail Lines in Michigan

Michigan's rail network reached its peak mileage in 1909 with 9,059 miles, compared to today's 3,567 miles. As shown in Figure 13, rail route mileage in Michigan declined consistently between 1910 and 2010.

Figure 13. Route Miles of Railroad Track in Michigan, 1840 - 2010



Source: MDOT, *Michigan's Railroad History 1825 - 2014*

While much of the nearly 5,500 miles of Michigan rail lines taken out of service since 1910 have been repurposed so that they no longer represent continuous transportation corridors, some segments have been "railbanked."

The Michigan Legislature enabled MDOT to purchase rail lines to not only preserve rail service but also for railbanking. Michigan has an extensive network of rail trails as shown in Figure 14. Not all of these are railbanked, and some were likely purchased and converted to trail use without railbanking procedures.

Figure 14. Michigan Rail Trails

Source: Michigan Department of Natural Resources

3.2.4 Military Strategic Rail Corridor Network

The U.S. Department of Defense has identified a Strategic Rail Corridor Network (STRACNET), which consists of 32,500 miles of rail lines critical to the movement of essential military equipment to ports located around the country, as well as another 5,000 miles of track essential to connect military facilities to each other.

Michigan has 73 miles designated as part of STRACNET and 271 miles designated as STRACNET connectors.

Figure 15. Michigan Strategic Rail Corridor Network

Source: U.S. Military Transportation Management Command

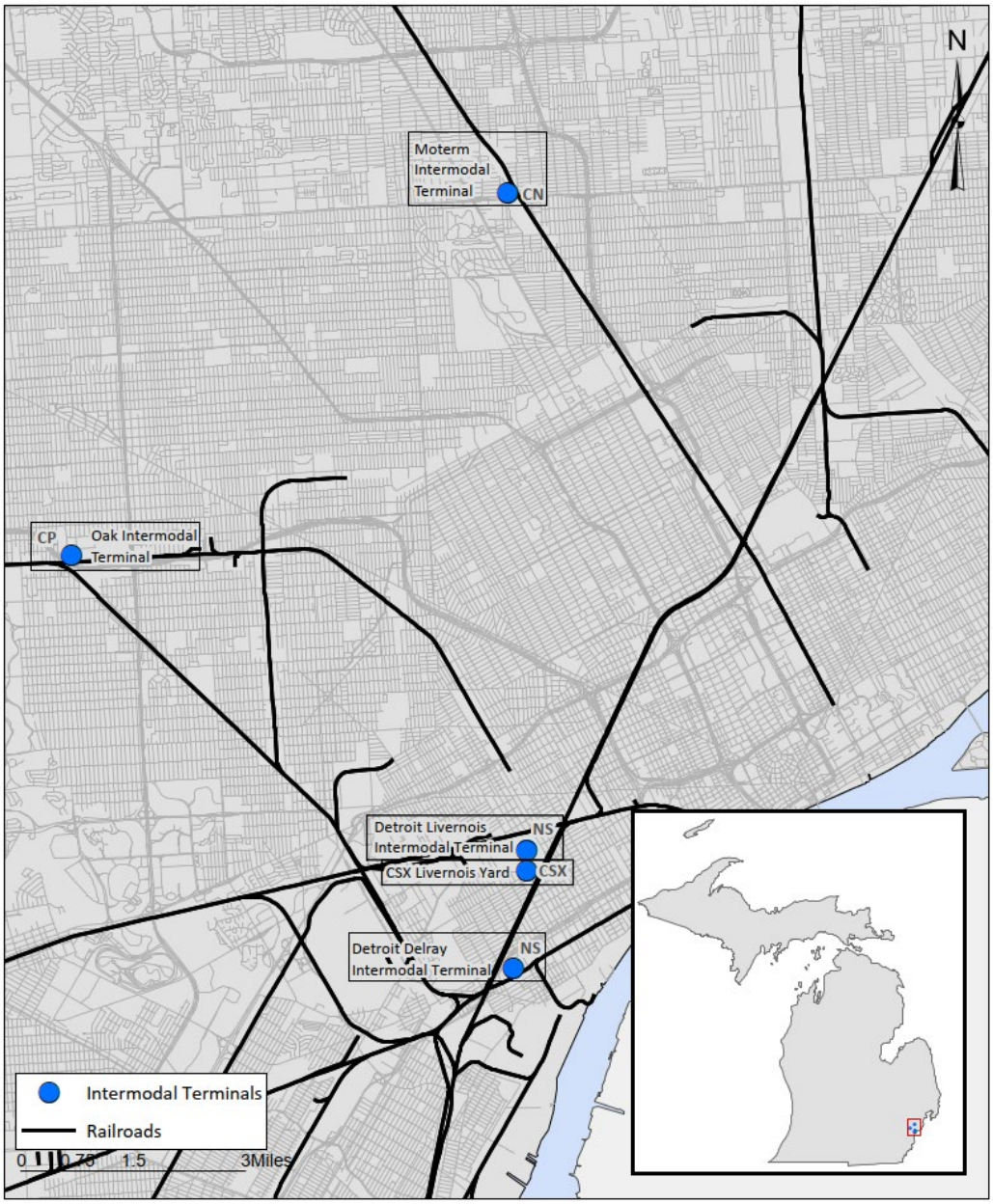
3.3 MULTIMODAL TERMINAL INVENTORY

3.3.1 Multimodal Truck/Rail Terminals

For the purposes of MM2045, truck/rail facilities have been divided into four categories:

- **Intermodal terminals**. For freight railroads, "intermodal" generally refers to containers on flatcars or trailers on flatcars. Five intermodal terminals are located in Michigan, all of which are clustered in the Detroit area as shown in Figure 16.

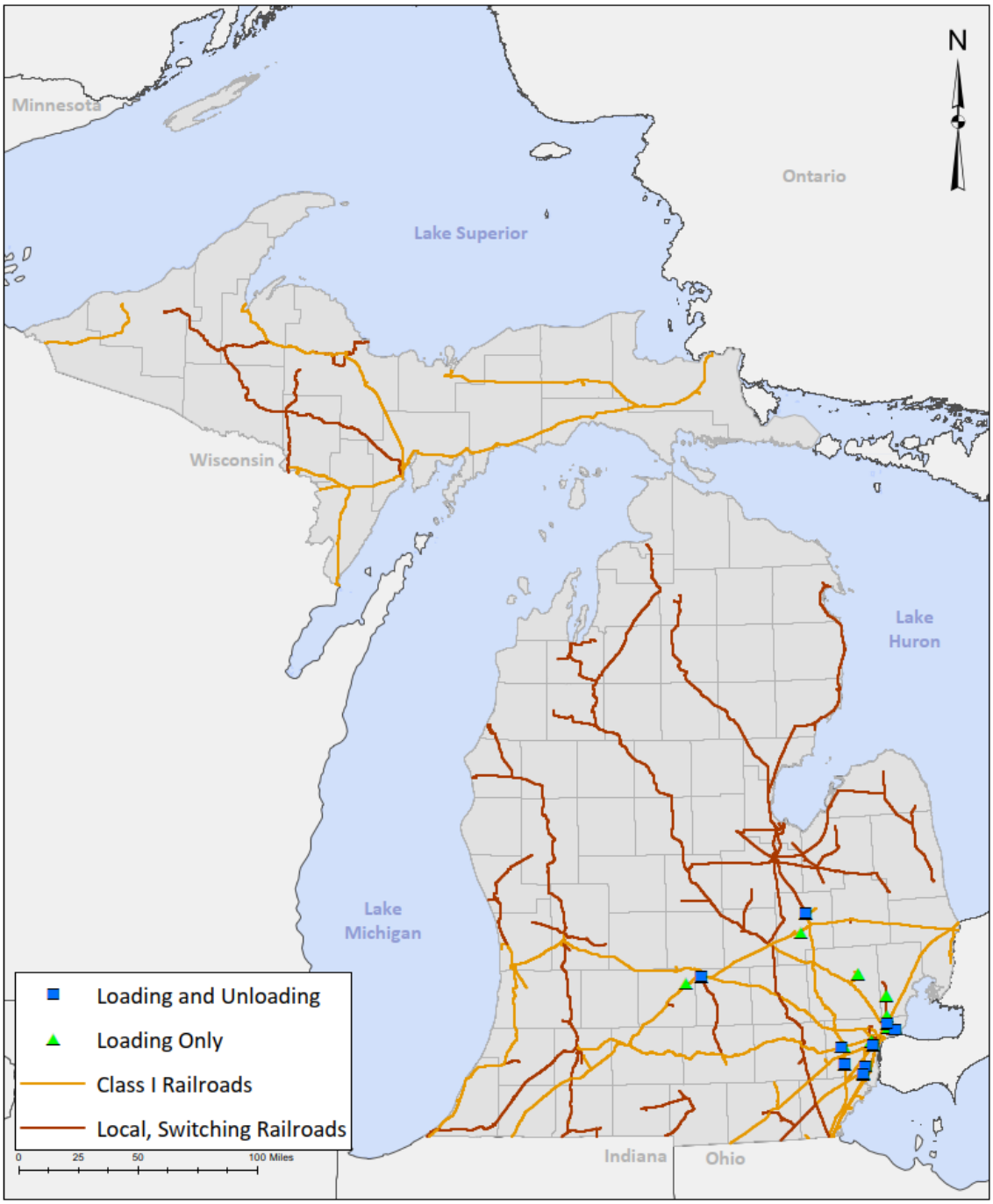
Figure 16. Michigan Intermodal Terminals



Source: Railroad Carrier Websites, MDOT Transload Database

- **Automotive Ramps.** Motor vehicles are frequently shipped by rail, either to or from ports as exports or imports, or from assembly plants to domestic markets. Given the concentration of vehicle assembly plants in Michigan, all automotive rail ramps in the state feature automotive loading. Each is associated with an automotive assembly plant.

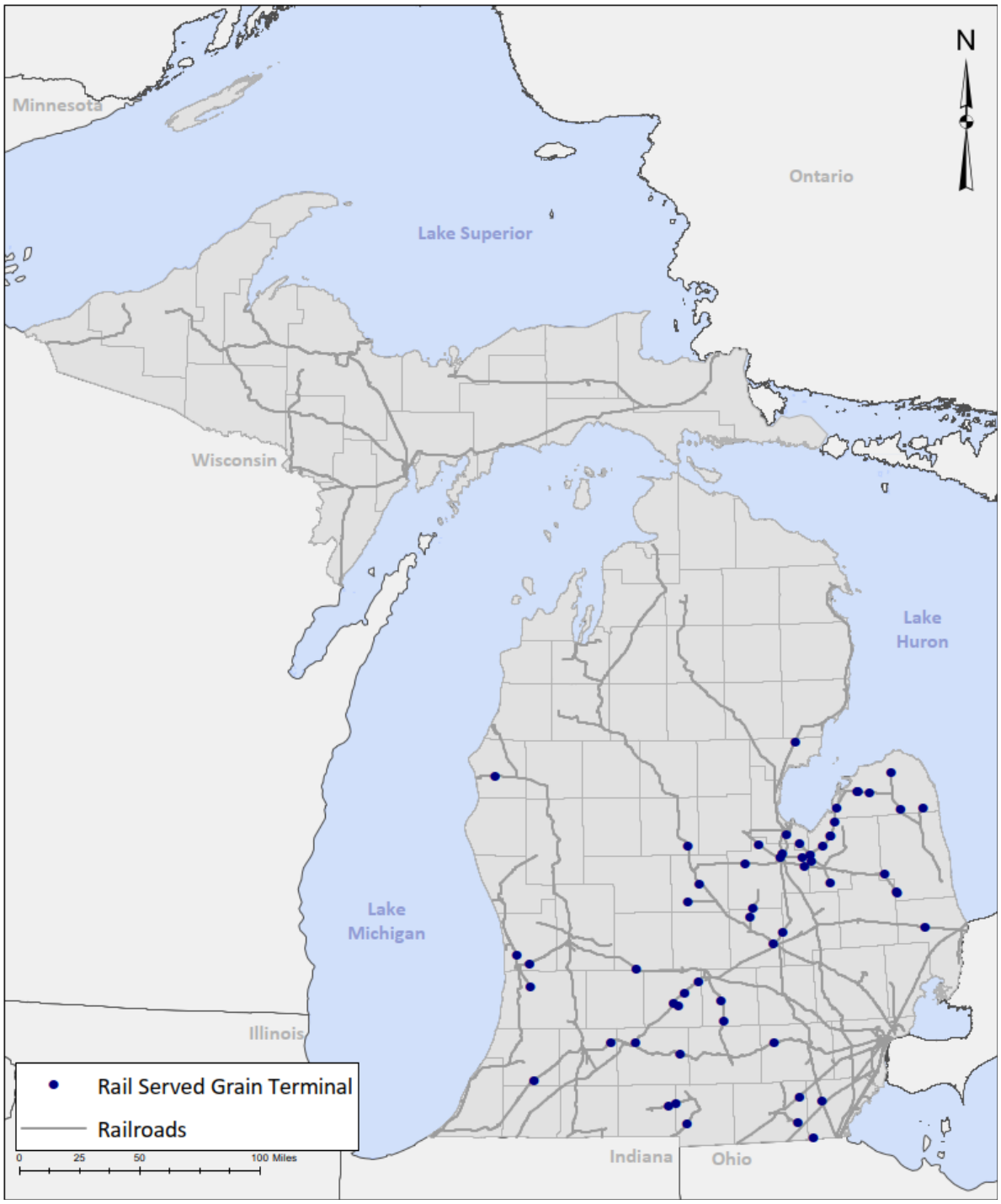
Figure 17. Michigan Rail Automotive Ramps



Source: AAR

- **Grain Elevators.** Rail is important to Michigan agriculture. Many of Michigan's grain elevators are rail-served, as displayed in Figure 18. As shown, grain elevators tend to cluster in the "thumb" area, as well as throughout the central part of Michigan.

Figure 18. Michigan Rail-Served Grain Elevators



Source: Michigan Department of Agriculture and Rural Development

- **Transload facilities**. The term "transload" refers to a broad range of truck/rail transfer facilities. For the purposes of MM2045, these are facilities that do not fit into other, more specific categories of truck/rail transfer facilities such as intermodal terminals, automotive ramps, and grain elevators. They can consist of simply a rail siding with a space for a truck to load or unload adjacent to the track, to more elaborate with

specialized equipment or storage, and in some instances, providing value-added services.

Figure 19. Michigan Transload Facilities

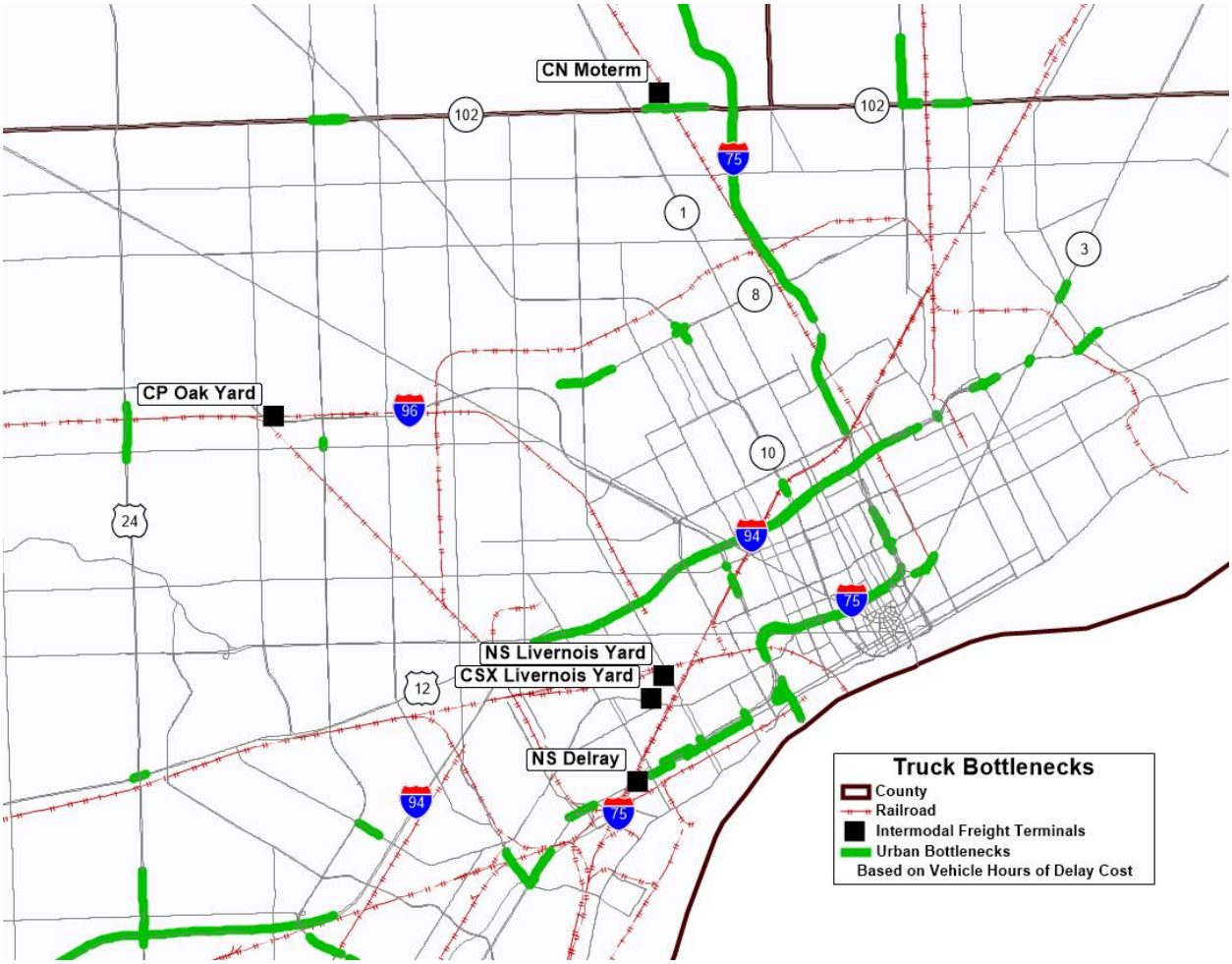
Source: Michigan Department of Agriculture and Rural Development

3.3.2 Intermodal Connectivity-Bottlenecks

Figure 20 shows highway bottlenecks in the Detroit area that affect intermodal terminals. The Canadian National Moterm and Norfolk Southern facilities are directly affected by or are

partial contributors to the truck bottlenecks in the immediate vicinity of the terminals. They are on M-102 (8 Mile Road), affecting access to Moterm, and on I-75 and M-85 (Fort Street) in the Delray neighborhood, affecting access to the Norfolk Southern terminal.

Figure 20. Intermodal Terminal Highway Access Bottlenecks

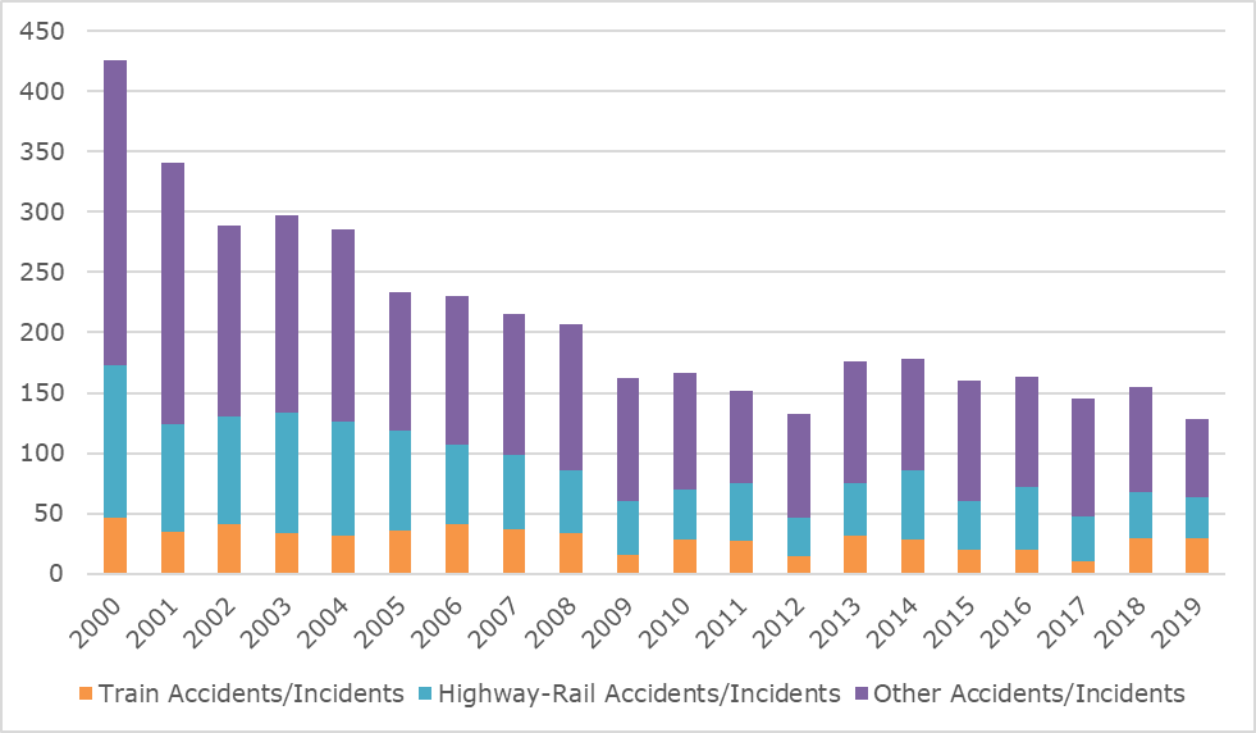


Source: MDOT/WSP analysis

3.4 CROSSING INVENTORY AND SAFETY

As shown in Figure 21, rail-related accidents and incidents[1] in Michigan have generally declined over the past 20 years. Total accidents and incidents on the Michigan rail system decreased from an average of 277 per year between 2000 and 2009 to an average of 169 per year between 2010 and 2019.

Figure 21. Rail-Related Accidents and Incidents in Michigan (20-year Trend)

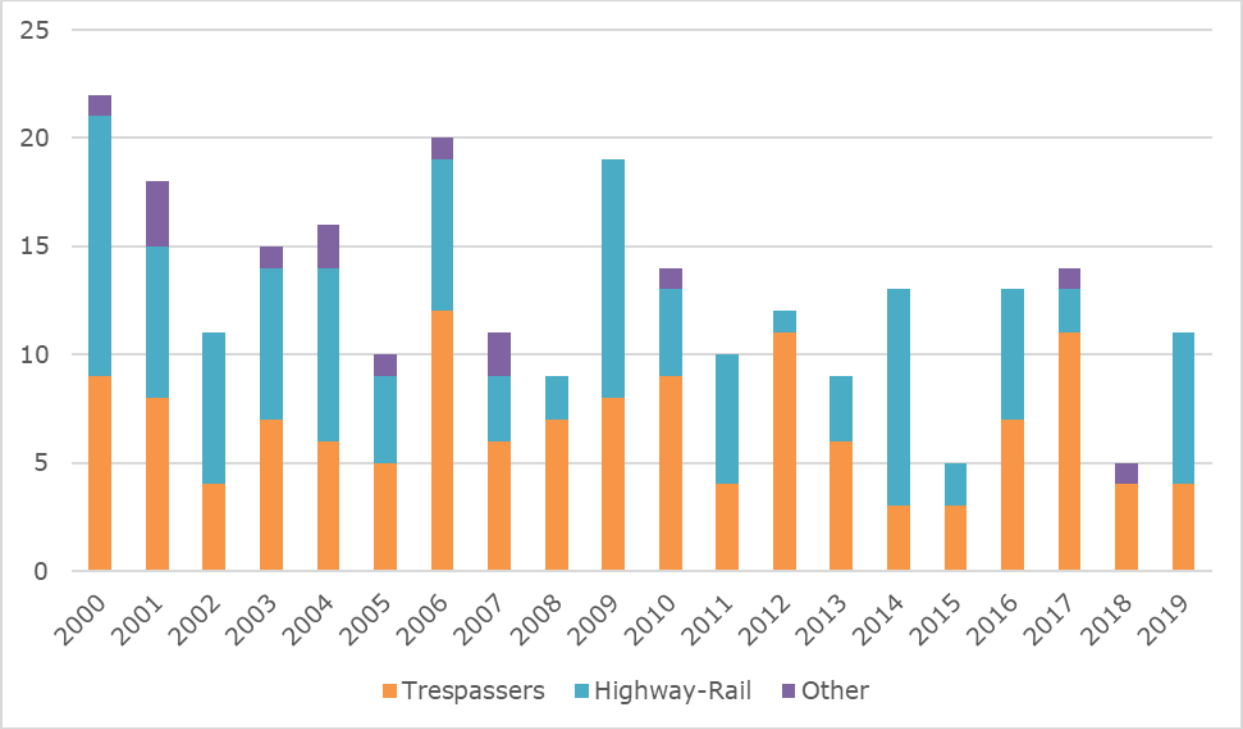


Source: Federal Railroad Administration Office of Safety Analysis, MDOT
Note: Highway-rail accidents include motor vehicle-train accidents only and exclude bicycles or pedestrians struck by trains.

[1] FRA uses the terms "Accidents and incidents" to refer to a variety of reportable events that could be collisions, derailments, other events that cause property damage and/or injuries or fatalities. Accidents and incidents also refer to occupational illnesses to railroad employees.

As shown in Figure 22, rail-related fatalities have also generally decreased. The average number of trespasser fatalities per year decreased 14 percent between the 2000 and 2009 period and the 2010 to 2019 period, while the average number of fatalities at highway-rail grade crossings decreased by 40 percent, and fatalities from other causes declined by 73 percent between the same periods.

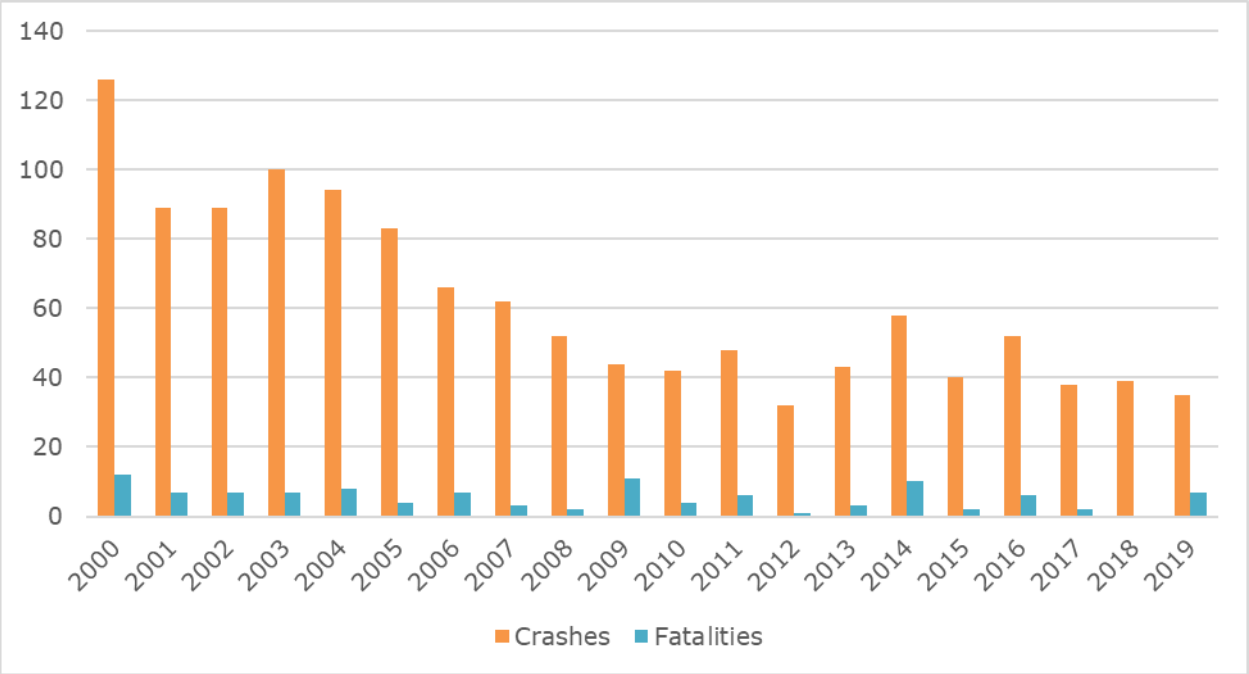
Figure 22. Rail-Related Fatalities in Michigan (20-year Trend)



Source: Federal Railroad Administration Office of Safety Analysis, MDOT
Note: Highway-rail accidents include motor vehicle-train accidents only and exclude bicycles or pedestrians struck by trains.

The overall number of train-motor vehicle crashes declined by 47 percent, as shown in Figure 23.

Figure 23. Highway-Rail Crashes



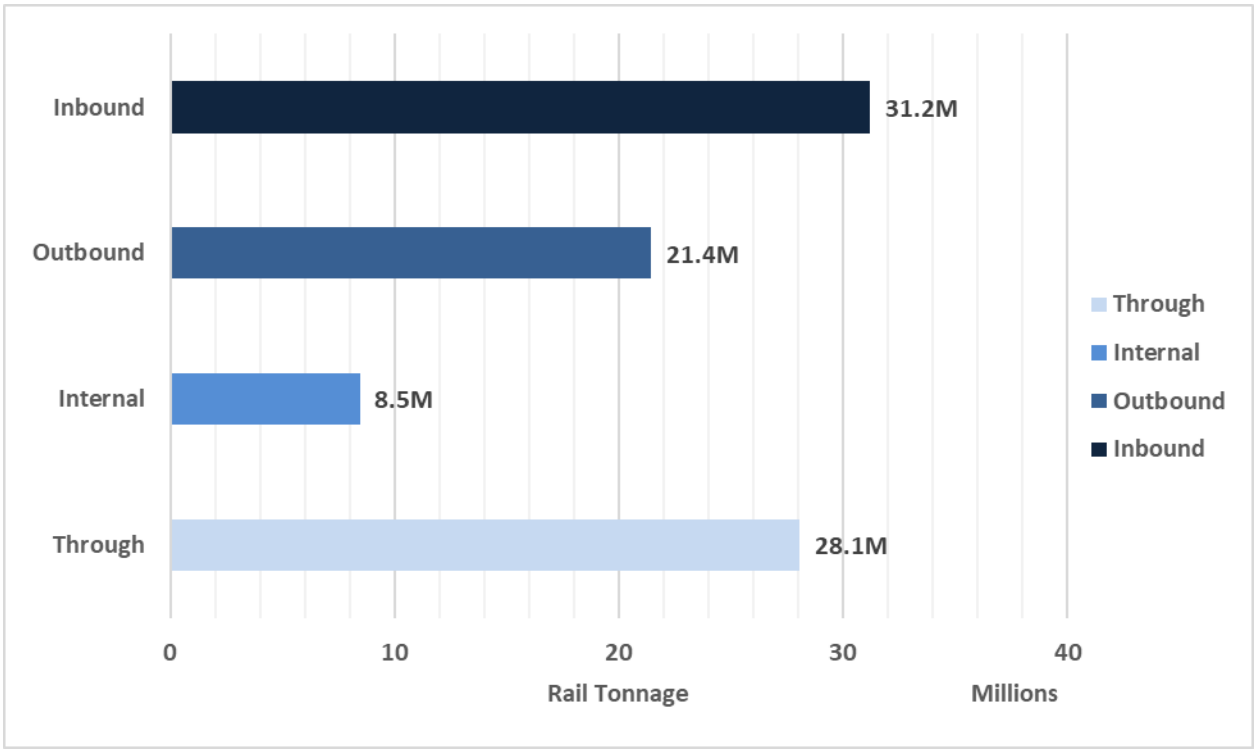
Source: MDOT

3.5 RAIL TRAFFIC SUMMARY

Michigan's freight rail system is integral to the Michigan economy and the mode of choice for a significant volume of commerce between Michigan and its trading partners.

In 2018, intra-Michigan rail freight traffic accounted for 8.5 million tons (about 9 percent) of total rail tonnage in the state. The largest category was inbound freight from other states and Canada, amounting to approximately 35 percent of total traffic (31.2 million tons). Shipments to other states and Canada comprise 24 percent of all rail Michigan freight tonnage (21.4 million tons) while through-traffic made up 31 percent of total traffic (28.1 million tons).

Figure 24. Freight Rail Tonnage by Direction (2018) Millions of Tons

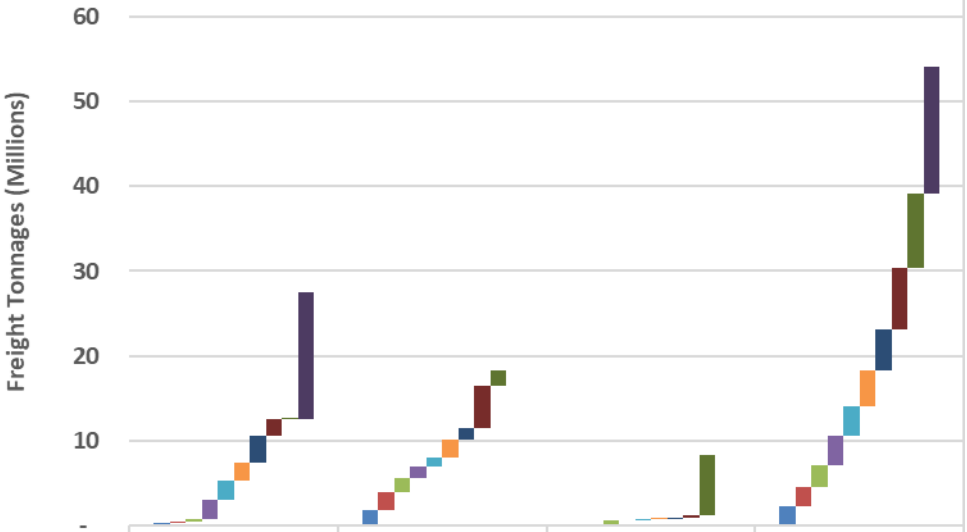


Source: 2018 Surface Transportation Board Waybill data, MDOT analysis

Rail's role is usually to carry low-value products. The national average value per ton of commodities shipped by rail in 2018 was $416 compared to $1,108 shipped by truck. However, in Michigan, the value per ton of goods shipped by rail is higher than the value per ton of goods shipped by truck, at $1,860 and $1,575, respectively, primarily due to rail's role in shipping automobiles.

Figure 25 shows the top 10 originating and terminating rail freight commodities in Michigan. Coal was the largest Michigan rail commodity by tonnage, nearly all of which is inbound to the state. Other prominent commodities include metallic and nonmetallic ores and metal products, farm products, chemical products, transportation equipment, and waste and scrap material. Section 3.7 explores the top Michigan rail freight commodities in more detail.

Figure 25. Top Originating and Terminating Rail Freight Commodities in Michigan (2018)



	Inbound	Outbound	Internal	Total to/from/within MI
Coal	14,872,298			14,872,298
Metallic Ores	8,680	1,806,846	7,000,000	8,815,526
Transportation Equipment	2,020,600	4,964,860	312,720	7,298,180
Chemical Products	3,134,793	1,448,280	185,960	4,769,033
Primary Metal Products	2,081,520	2,083,304	14,920	4,179,744
Petroleum or Coal Products	2,329,020	1,056,329	151,092	3,536,441
Miscellaneous or Mixed Shipments	2,160,480	1,313,520		3,474,000
Nonmetallic Ores and Minerals	285,976	1,701,876	528,600	2,516,452
Farm Products	128,468	2,114,887	72,076	2,315,431
Waste or Scrap Material	415,400	1,843,996	16,320	2,275,716

Source: 2018 Surface Transportation Board Waybill data, MDOT analysis

3.6 GEOGRAPHY OF MICHIGAN RAIL FREIGHT TRAFFIC

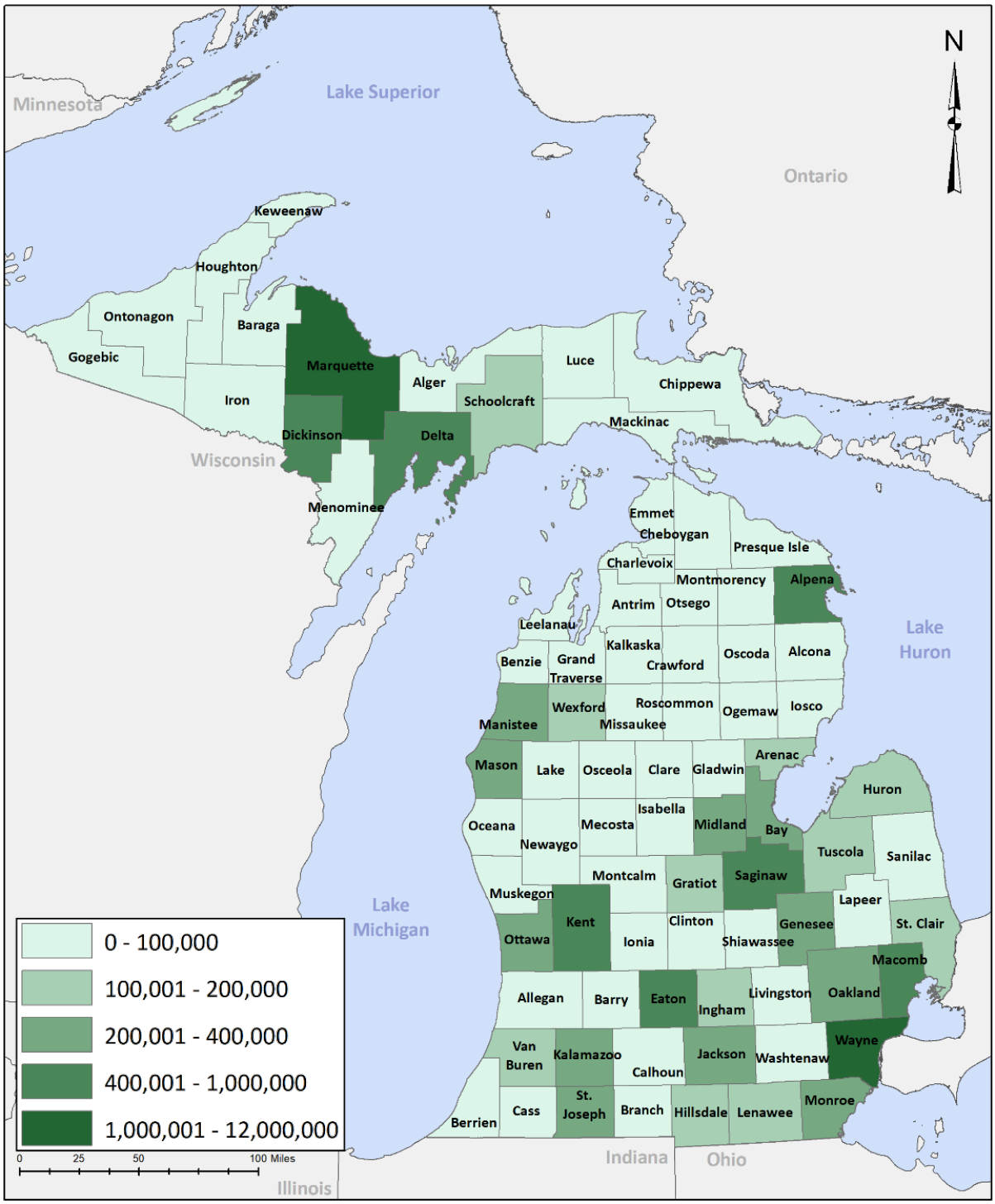
3.6.1 Rail Freight Originations in Michigan

Figure 26 identifies freight rail tonnage shipped from Michigan by county. Marquette County in the Upper Peninsula and Wayne County in the Detroit area are the top two freight rail originating counties in Michigan. Half of all outbound rail traffic originates in Wayne County. Finished vehicles destined to Illinois, Missouri, Florida, Texas, and to seaports in Maryland make up a large portion of Wayne County outbound tonnage. Also shipped from the county are metals to production facilities in Ohio and Indiana, and intermodal mixed freight to New Jersey and Virginia.

Within Marquette County, rail movements are dominated by iron ore moving approximately 20 miles from the Tilden Mine to the ore dock in Marquette. From there, the ore travels by water to steel-production facilities throughout the south Great Lakes. Iron ore moving by rail out of Marquette County has decreased since the closing of the Empire Mine in 2016 and the subsequent closing of the ore dock in Escanaba. Large volumes of steel are shipped from the county to the Algoma Steel plant in Sault Ste. Marie, Ontario, and have remained steady over the past several years.

Other notable intrastate movements include crushed limestone from Alpena County to locations in mid-Michigan, and intra-county movements of finished vehicles and transportation equipment in Wayne County.

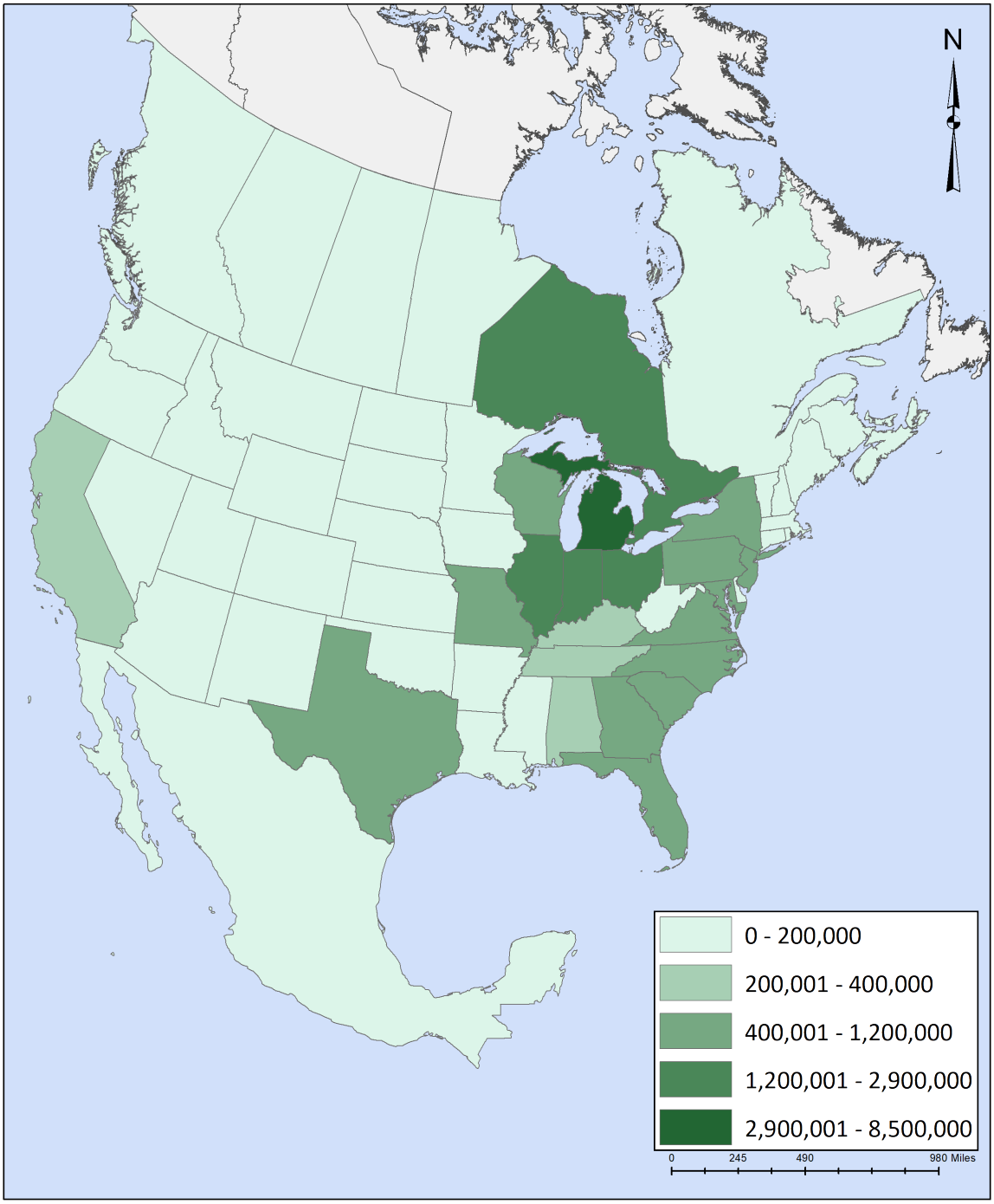
Figure 26. Top Rail Freight Originating Counties in Michigan



Source: 2018 Surface Transportation Board Waybill data, MDOT analysis

Figure 27 illustrates the top outbound destinations for Michigan rail freight. Illinois, Missouri, Texas, and Florida are destinations for finished vehicles, while East and Southeast states are destinations for agriculture products. Rail freight from Michigan to Ontario primarily consists of metallic ores, fiberboard, and chemical products.

Figure 27. Michigan Freight Rail Outbound by State/Province Trading Partner



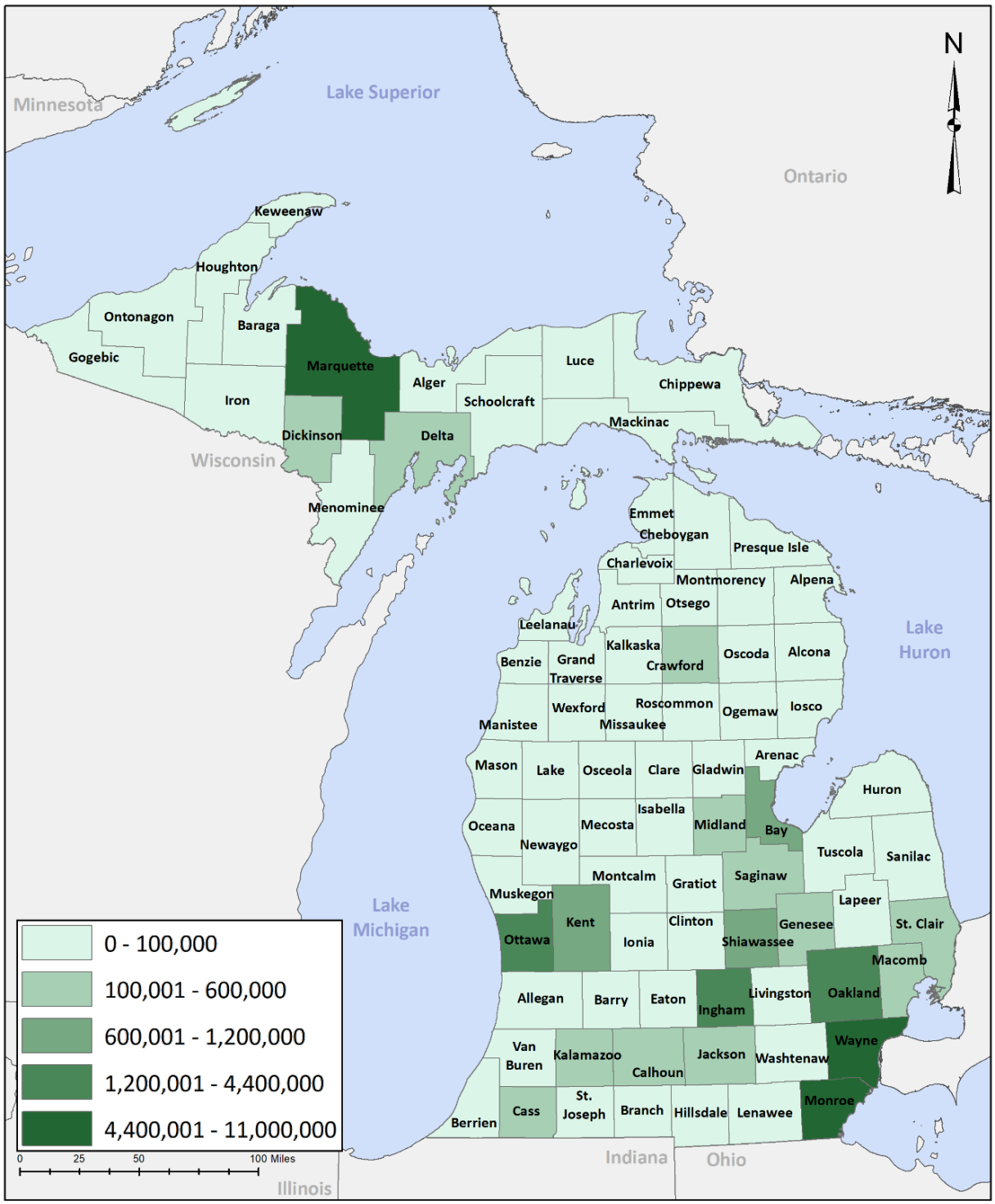
Source: 2018 Surface Transportation Board Waybill data, MDOT analysis

3.6.2 **Rail Freight Terminations in Michigan**

Coal accounted for nearly half of inbound rail tonnage in 2018. Although coal was shipped by rail to destinations throughout the state, most was destined for power generating facilities in Monroe, Ottawa, Wayne, and Bay counties. Wyoming (via Chicago) and Pennsylvania are the primary origins of inbound coal. These movements have decreased over the years as power plants have closed or converted to cleaner energy sources. The density map in Figure 28 provides an overview of the top freight attractors in the state. Marquette County's high volume of terminating freight reflects the intra-county metallic ore shipments described above.

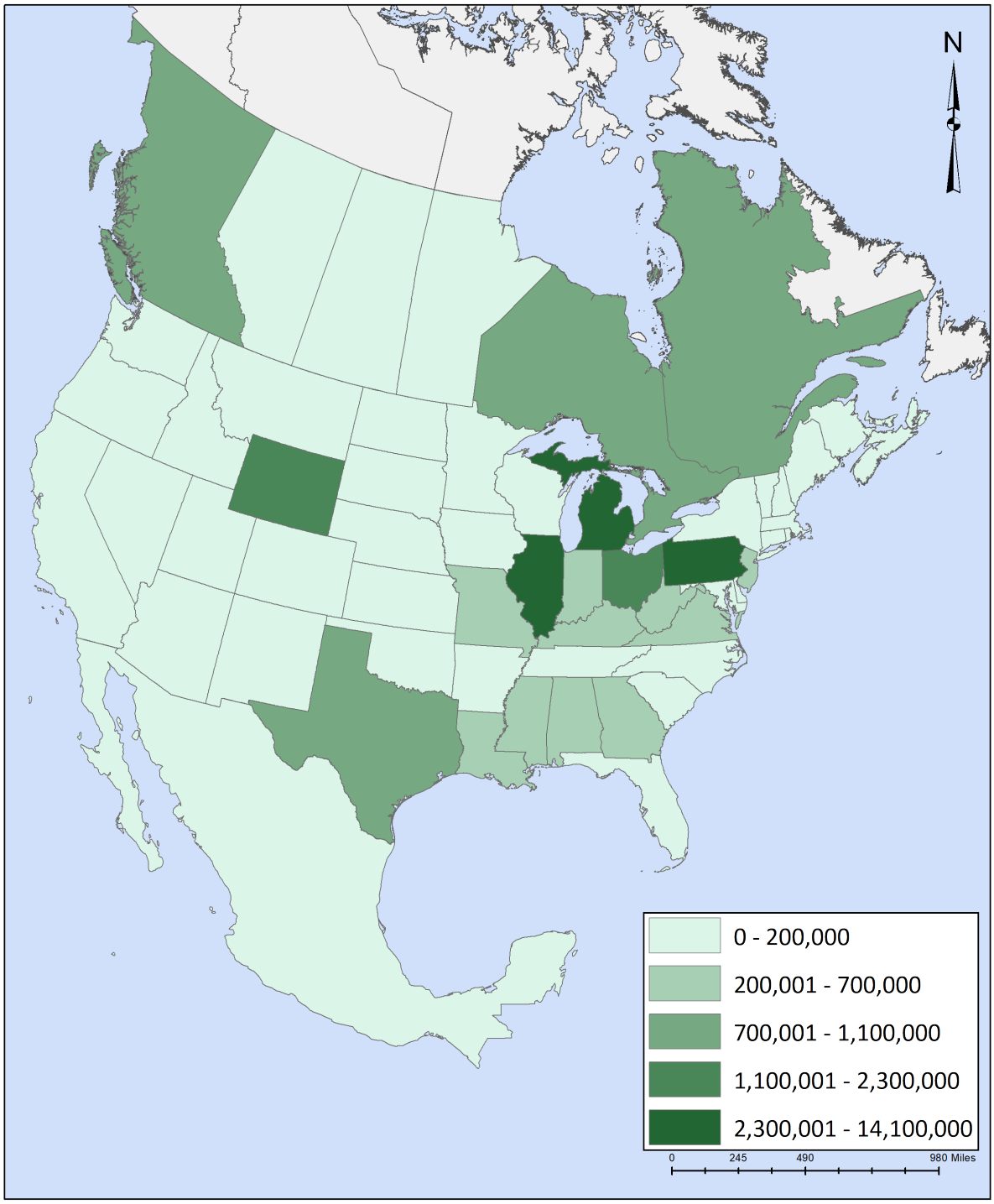
Figure 29 shows the leading origins of rail freight terminating in Michigan. As noted earlier, Wyoming and Pennsylvania are major sources of coal, while the inbound traffic from Canada comprises log shipments from Ontario, and fiberboard and other lumber products from Quebec. Corn syrup from Illinois to Calhoun County is another major inbound movement.

Figure 28. Top Rail Freight Attracting Counties in Michigan



Source: 2018 Surface Transportation Board Waybill data, MDOT analysis

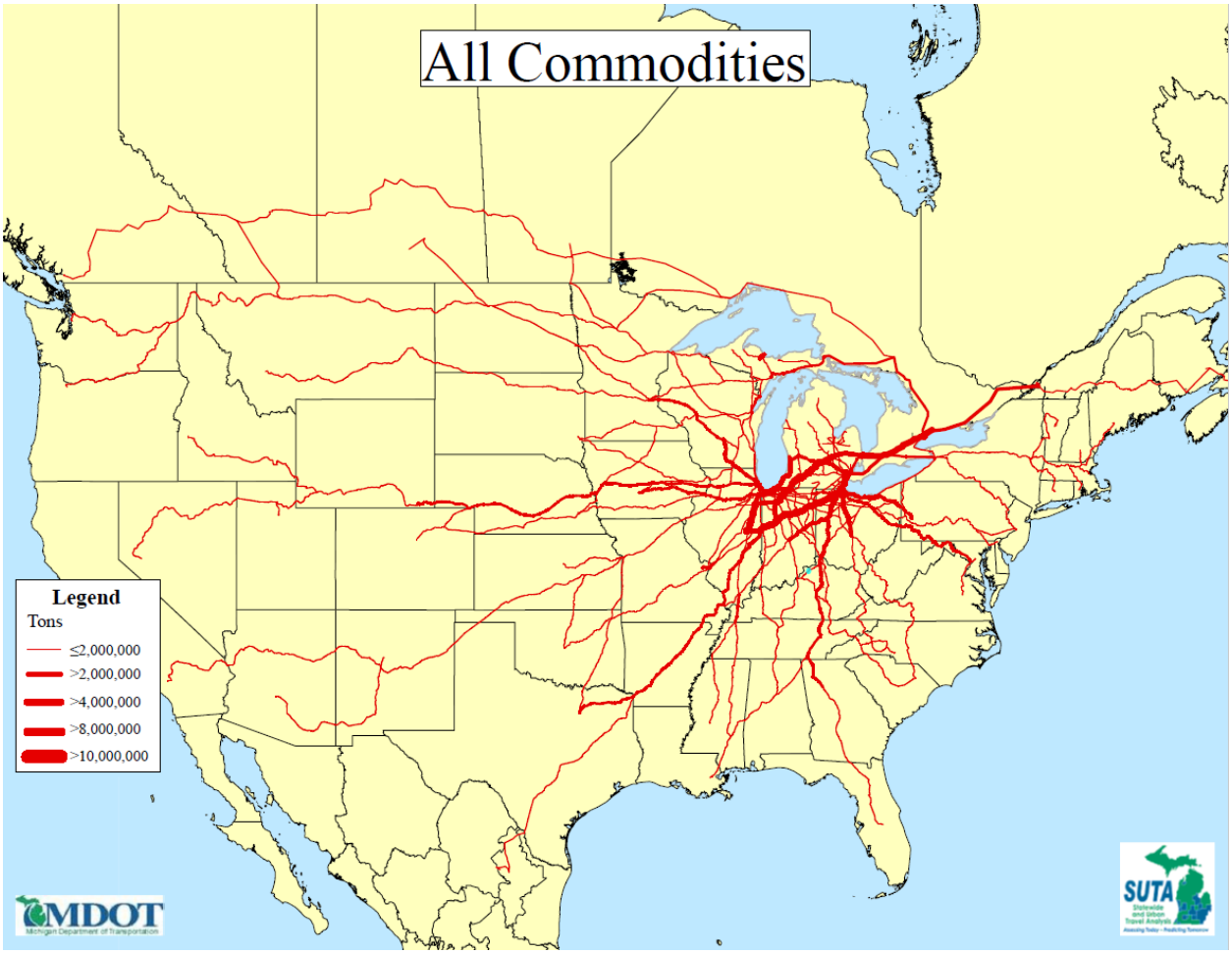
Figure 29. Michigan Freight Rail Inbound Tonnage by State/Province Trading Partner



Source: 2018 Surface Transportation Board Waybill data, MDOT analysis

Figure 30 provides a domestic and international network perspective on Michigan's rail traffic flows. As shown, Michigan's heaviest traffic flows are between Michigan and nearby states and provinces such as Illinois, Ohio, Ontario, Indiana, Pennsylvania, Iowa, Minnesota, and Wisconsin. However, the state's reach extends throughout the U.S, Canada, and into Mexico. Figure 30 also shows extensive connectivity of Michigan with port facilities in Halifax, Baltimore, Montreal, New Orleans, Seattle, and Vancouver.

Figure 30. Commodity Movements To/From Michigan



Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

Focusing specifically on rail flows within Michigan, the two highest volume corridors are (1) the Canadian National line that crosses the state between southwest Michigan and Port Huron and (2) the corridor between Toledo, Ohio, and Detroit, consisting of parallel rail lines of Norfolk Southern, Canadian National, and CSX. Figure 9 shows the importance of Michigan in foreign trade. If thought of in the context of just the United States, Michigan would be a rail "cul-de-sac," but if thought of in the context of North America, Michigan is a gateway with some of its most important rail corridors being those that connect with Canada.

Figure 31. Michigan Freight Rail Traffic Flows

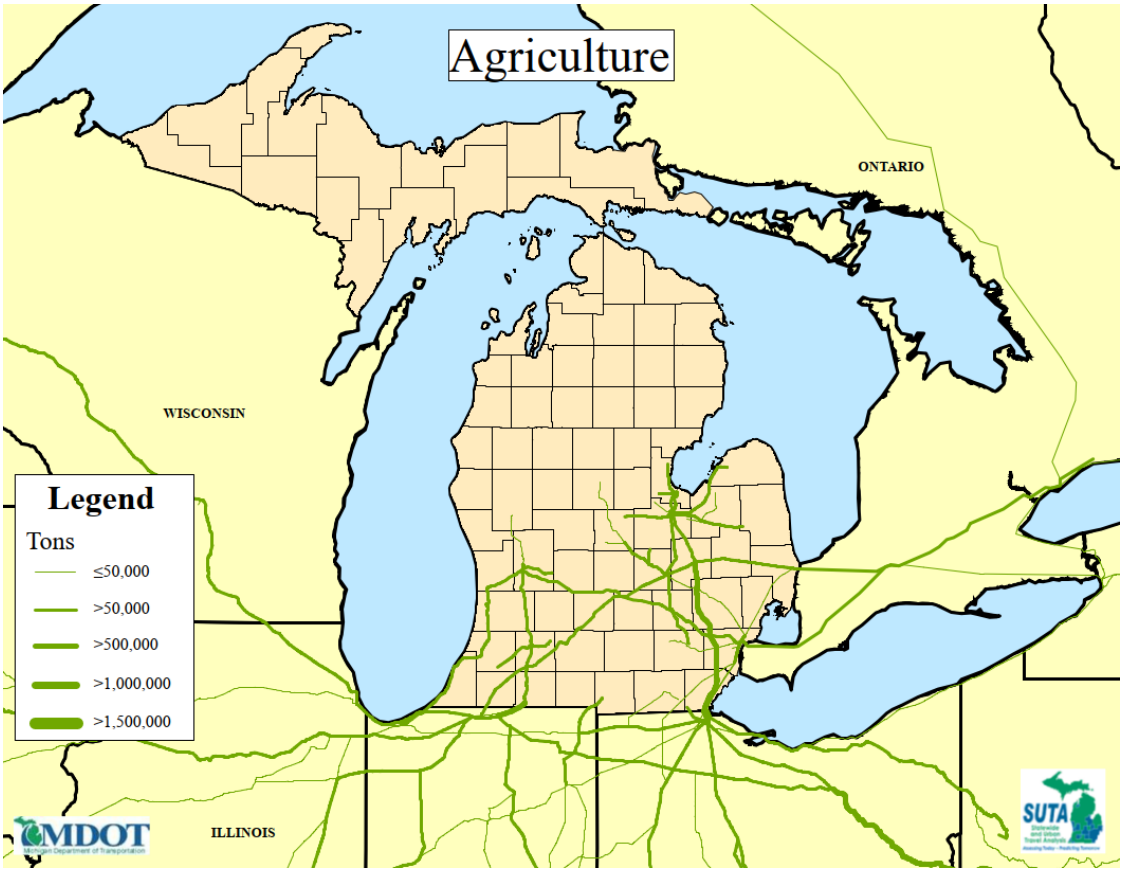
Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

3.7 COMMODITY NETWORKS

3.7.1 Agriculture/Food Products

Rail shipments of agricultural products in Michigan have decreased each of the last five years. Outbound movements make up most shipments in the state at nearly 80 percent. The low 2018 traffic volumes were mostly due to a poor harvest season. The outbound shipments include wheat, barley, and soybeans from the Saginaw Bay region and central and south Michigan headed to the southeast U.S. chicken- and pork-producing states of Virginia, North Carolina, South Carolina, and Georgia. Edible soybean production in Michigan's thumb region also heads south to Tennessee, Mississippi, Texas, and Mexico.

Figure 32. Michigan Agriculture Rail Network



Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

Food products are mostly through movements. Soybean cake meal from Iowa to Ontario and northeastern United States through Michigan are the biggest movements. The biggest inbound movement is corn syrup from Illinois to Calhoun County (site of Kellogg's North American headquarters) for cereal production. Spent grains from Calhoun and Lenawee counties, wheat flour from Branch County, and sugar from Bay County are notable outbound rail movements of food products.

3.7.2 Lumber and Paper

The major source of inbound log shipments is north Ontario, with the biggest movement to paper mills in Dickinson County in the Upper Peninsula of Michigan. Log shipments between Dickinson County and Wisconsin are significant, as well. Quebec is the leading origin of finished lumber products, delivered to Ohio, Illinois, and Michigan. Wayne County is the leading Michigan destination of inbound wood products (primarily lumber) from Quebec and Illinois.

The largest tonnages of paper by rail are outbound shipments of printing paper from Delta and Dickinson county paper mills to Illinois and Wisconsin. The highest volumes of wood pulp are shipped outbound from Dickinson County and through movements from Ontario to Wisconsin. Fiberboard is shipped by rail inbound and through Michigan. Much of the fiberboard originates in the south U.S. and Quebec. Destinations include Ontario, Michigan, and Ohio.

Figure 33. Michigan Lumber and Paper Products Rail Network

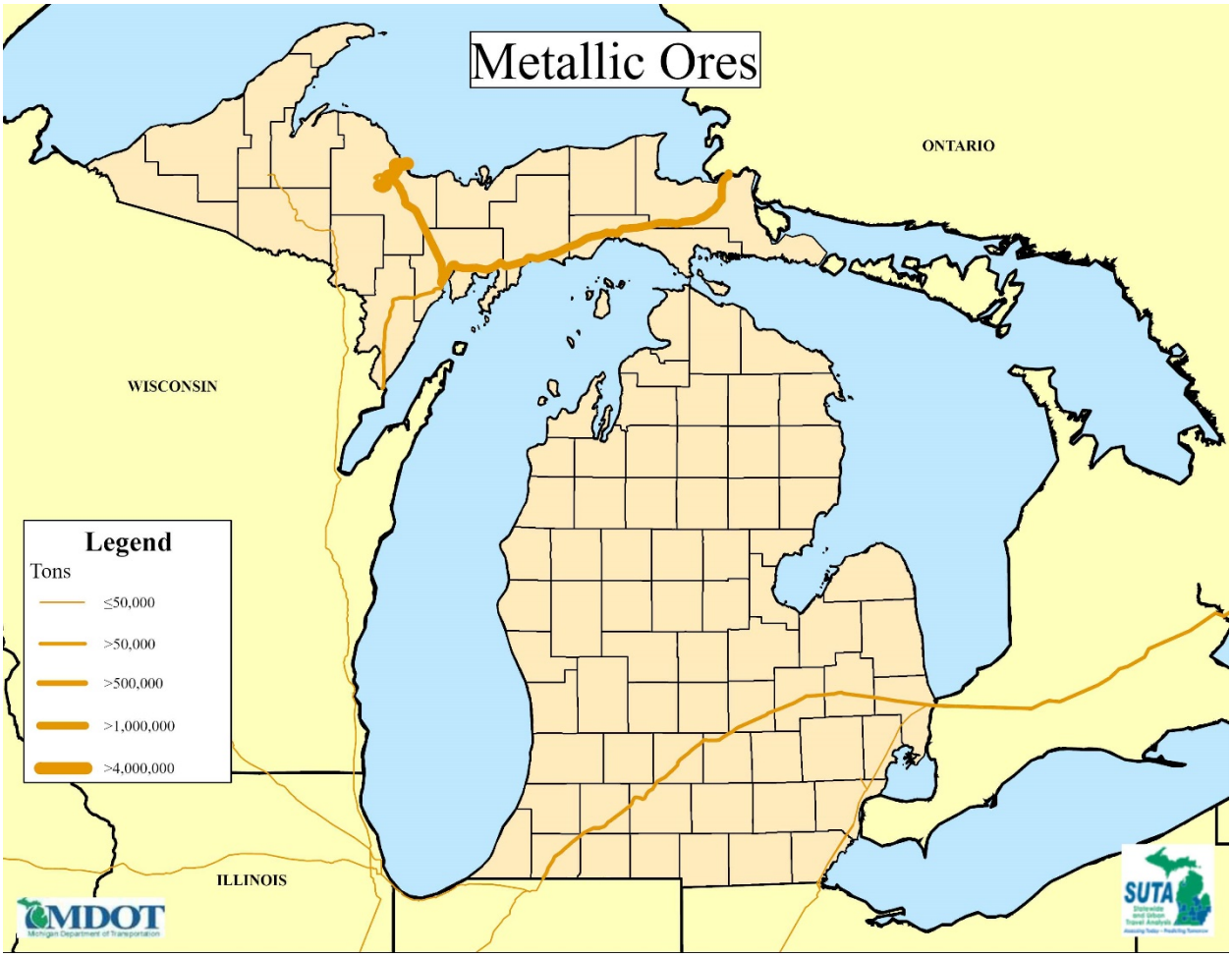
Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

3.7.3 Metallic Ores

Mining in the Upper Peninsula (particularly Marquette County) drives rail shipments of metallic ore in Michigan. As described earlier, a large portion of these rail movements are intrastate, with shipments to the ore dock in Escanaba constituting a primary move. From here, a significant portion of the ore is shipped by water to steel-production facilities throughout the south Great Lakes. Rail movements to locations outside the state (particularly Ontario) are also prominent, with the Algoma Steel plant in Sault Ste. Marie, Ontario, being a notable rail destination.

Overall, iron ore moving by rail out of Marquette County has decreased since the closing of the Empire Mine in 2016 and subsequent closing of the ore dock in Escanaba. However, a large movement of ore from the county to the Algoma Steel plant remains consistent.

Figure 34. Michigan Metallic Ores Rail Network

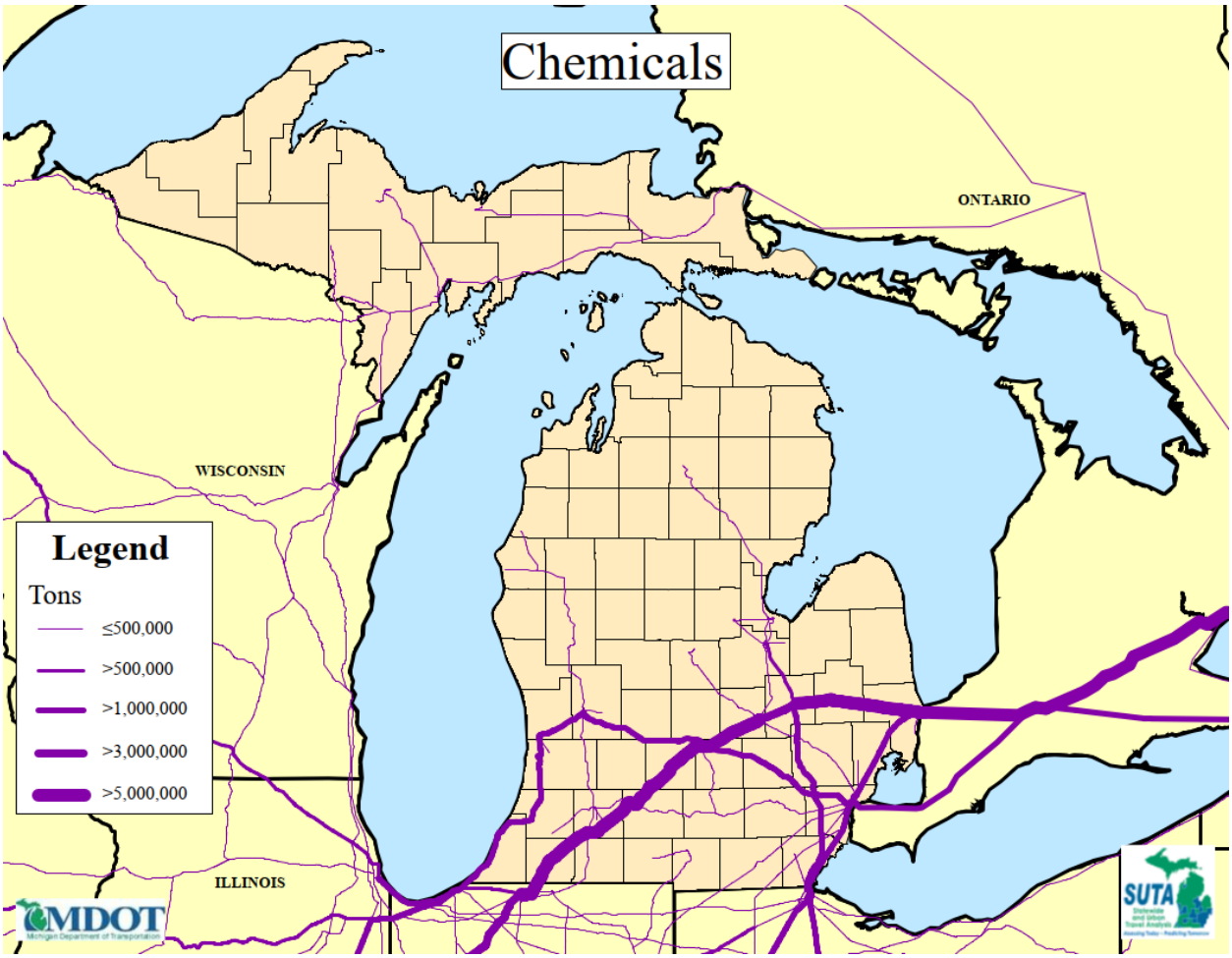


Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

3.7.4 Chemicals

At 8.2 million tons, chemical products represent the commodity with the highest volume moving through Michigan by rail. A wide range of chemical products move through the state. Ethanol shipments from Minnesota and Iowa to destinations in Ontario and New York are most prevalent. Synthetic plastic polyethylene and polyvinyl chloride are common movements to the Sarnia, Ontario, region, as well as vinyl chloride from Texas. Wayne County is the leading destination of chemicals by rail, with a wide variety of inbound commodities. The leading outbound chemical product is calcium chloride being shipped from Kent County to Illinois, New Jersey, and Ohio.

Figure 35. Michigan Chemicals Rail Network



Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

3.7.5 Coal and Petroleum Products

As mentioned previously, coal movements originating primarily from Wyoming and Pennsylvania are transported to power plants in Monroe, Ottawa, Wayne, and Bay counties (Figure 36).

Figure 36. Michigan Coal Rail Network

Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

Movements of petroleum or coal products consist mainly of inbound coke from Pennsylvania, West Virginia, and Ohio to the Dearborn and Great Lakes steel facilities, and outbound coke from Wayne County to steel-production facilities in north Indiana along Lake Michigan. Other significant commodity flows within this category include shipments of liquified petroleum gas from the region around Sarnia, Ontario, to destinations throughout the United States, as well as movements from Texas to Ontario.

3.7.6 Transportation Equipment

Transportation equipment accounts for approximately one-quarter of all outbound tonnage from Michigan. Finished vehicles produced by the state's automotive plants are primarily being transported to Illinois, Missouri, and to seaports in Maryland, Florida, and Texas. In addition to Wayne County traffic, finished vehicles also move from assembly plants in Eaton, Genesee, and Macomb counties, mainly to Illinois.

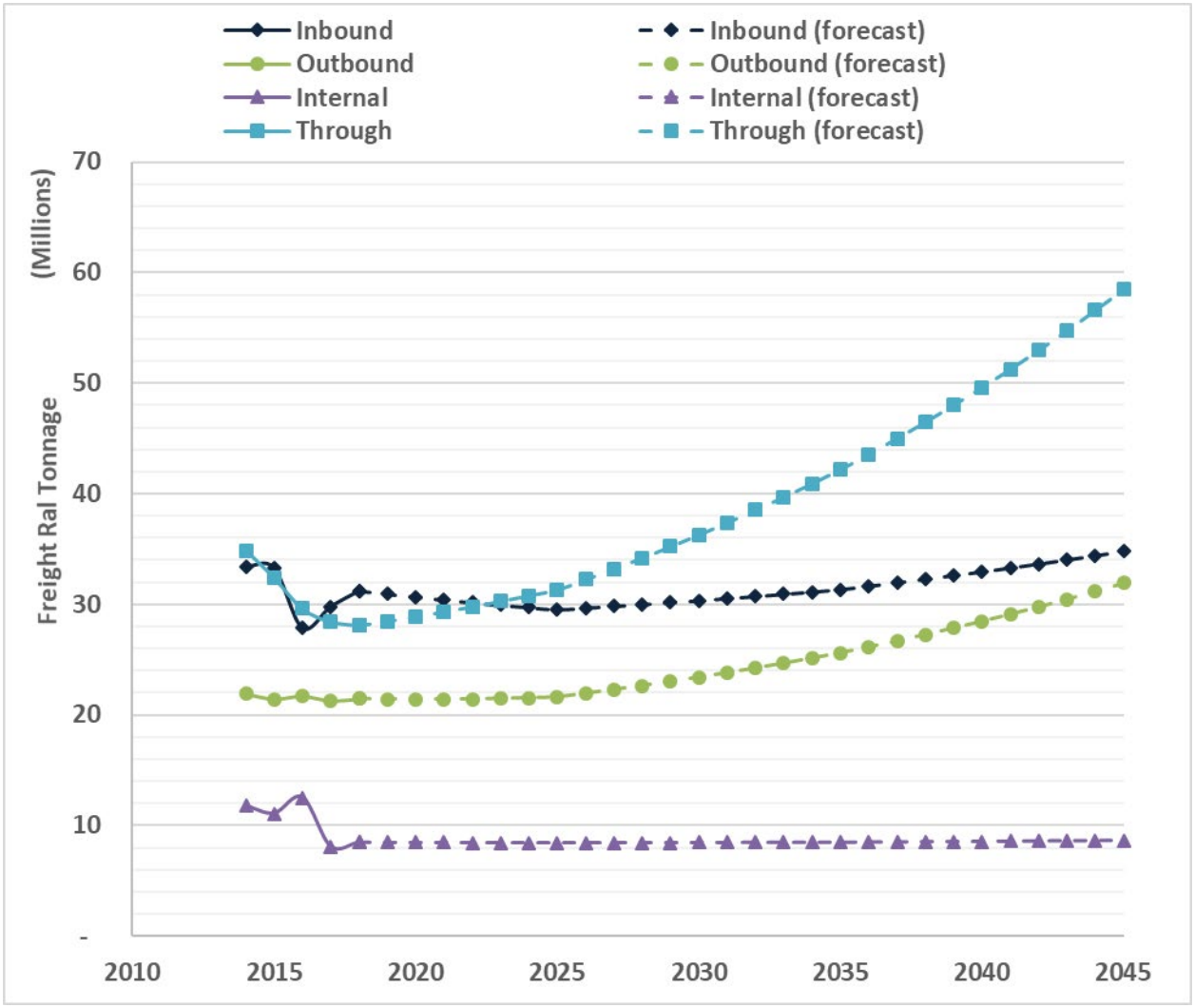
Figure 37. Michigan Transportation Equipment Rail Network

Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

3.8 FREIGHT TONNAGE TRENDS AND FORECASTS

Figure 38 provides freight rail forecasts by direction. Overall, freight rail tonnage is expected to increase by 50 percent between 2018 and 2045, or 1.5 percent per year. Most future year tonnage increases are attributable to growth in traffic passing through or originating in Michigan. Intrastate traffic is expected to have no growth over the next 30 years, while growth of inbound freight shipments is expected to be minimal.

Figure 38. Freight Rail Tonnage Trends and Forecast by Direction of Flow

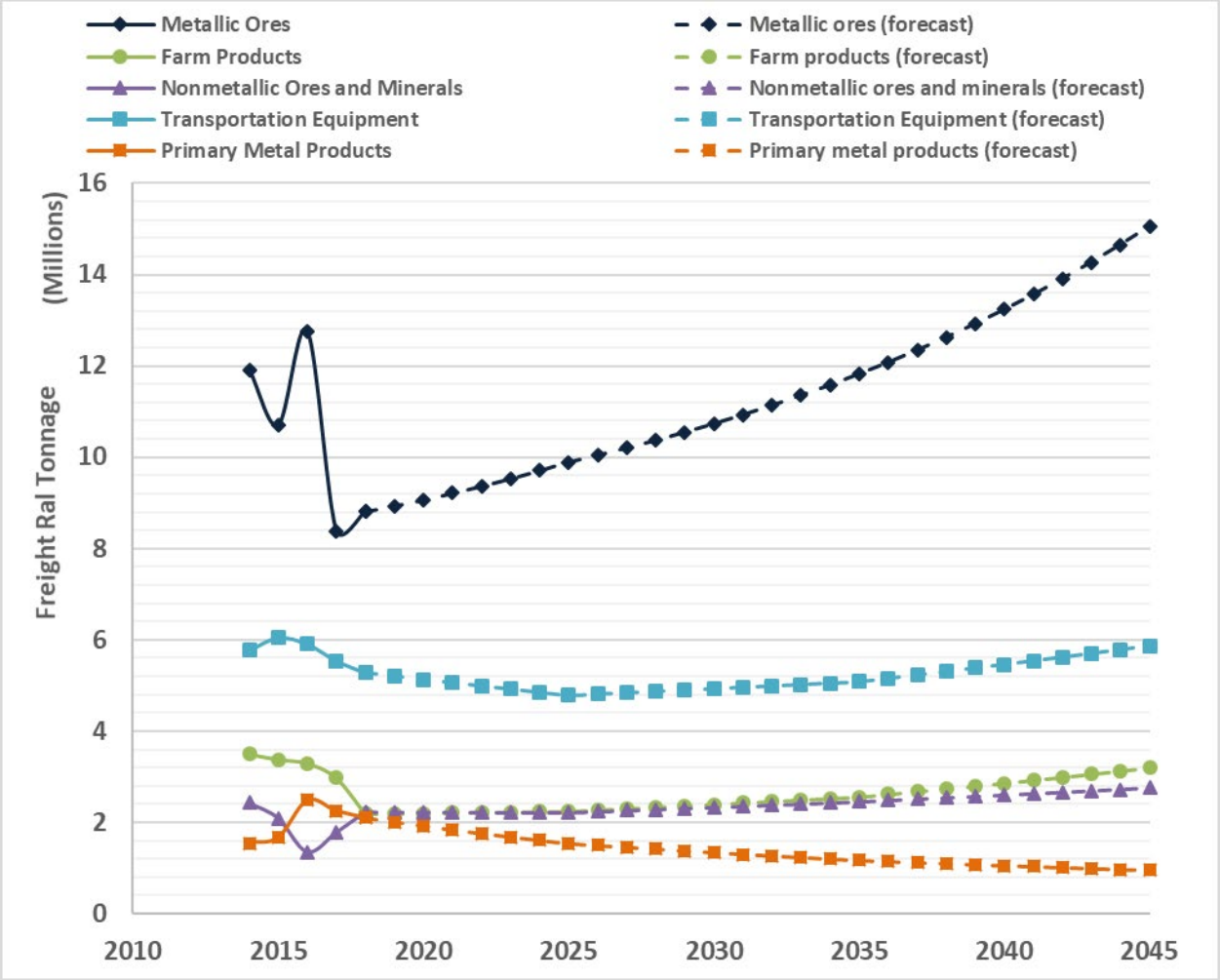


Source: 2018 Surface Transportation Board Waybill data, MDOT/WSP analysis

3.8.1 Commodity Trends and Forecasts

The five commodities with the most originating tonnage in 2018 were metallic ores, transportation equipment, nonmetallic ores and minerals, farm products, and primary metal products. Originating tonnage includes intrastate traffic.

Figure 39. Top Five Originating Commodities Trends and Forecasts

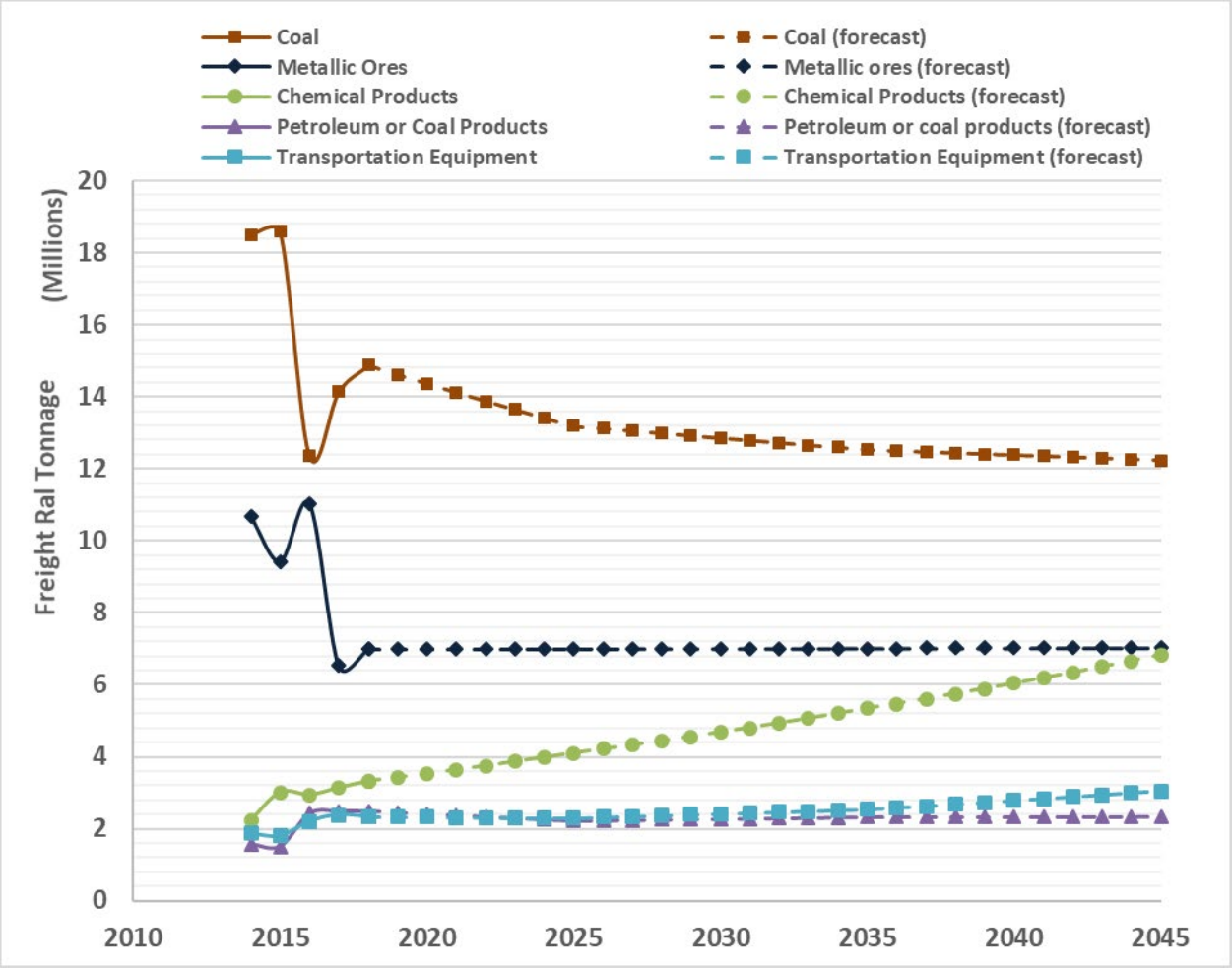


Source: 2018 Surface Transportation Board Waybill data, WSP analysis

Marquette County metallic ore shipments are expected to increase significantly between 2018 and 2045 (the forecast period) and remain the leading originating commodity in the state. Meanwhile, transportation equipment, nonmetallic minerals, and farm products are expected to see more modest increases. Primary metal product shipments are expected to fall through 2045.

The leading five base year (2018) terminating commodities are coal, metallic ores, chemical products, petroleum/coal products, and transportation equipment. Terminating tonnages also include intrastate traffic.

Figure 40. Top Five Terminating Commodities Trends and Forecasts

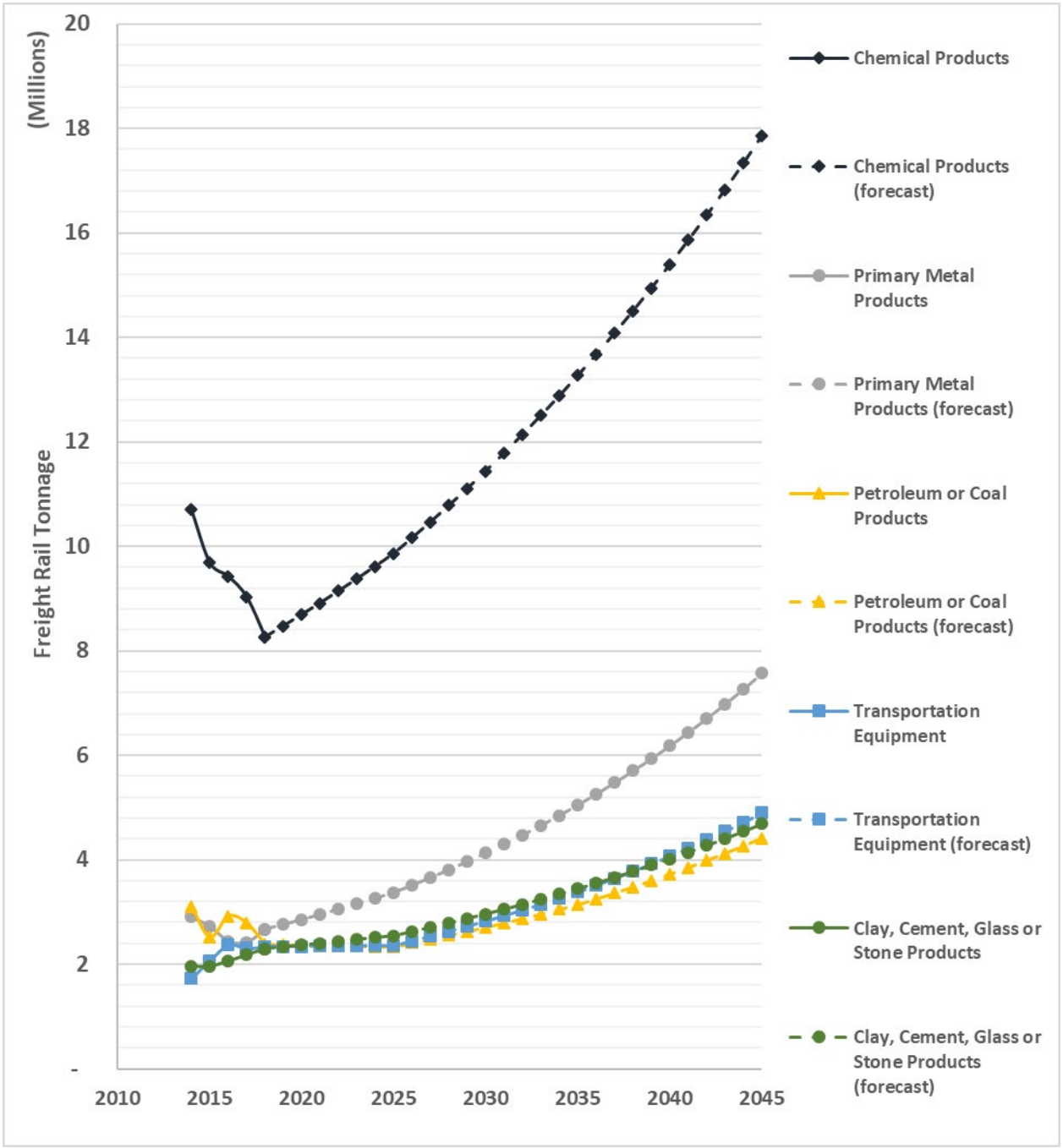


Source: 2018 Surface Transportation Board Waybill data, WSP Analysis

Although coal tonnage is expected to decrease over time, it is expected to remain the top inbound commodity into Michigan. Terminating metallic ores are expected to remain flat from 2018 to 2045. This contrasts with the steady upward trend in originated tonnage anticipated for metallic ores. The difference in trends can be explained by intra-county moves within Marquette County expected to be flat, while outbound shipments of ores across the south Great Lakes are expected to rise steadily. Inbound chemical product tonnage is also anticipated to grow, while petroleum and transportation equipment movements see smaller year-over-year positive changes across the forecast period.

As shown in Figure 41, growth in through-freight shipments in Michigan is primarily driven by forecasted increases in chemical shipments.

Figure 41. Top Five Through-Commodities Trends and Forecasts



Source: 2018 Surface Transportation Board Waybill data, MDOT, IHS Markit Analysis

4. Michigan Passenger Rail System

4.1 MICHIGAN'S INTERCITY PASSENGER RAIL SERVICES

MDOT contracts with Amtrak to provide three services in Michigan, as shown in Figure 42: (1) the Blue Water operating between Chicago and Port Huron, (2) the Pere Marquette operating between Chicago and Grand Rapids, and (3) the Wolverine operating between Chicago and Detroit/Pontiac.

Figure 42. Michigan Amtrak Service

The Michigan routes are part of Amtrak's state-supported corridor service network. Besides serving Michigan intrastate travel as well as access to Chicago, the Michigan services afford Michigan residents with connections to Amtrak's national network centered in Chicago. This affords travelers yet another means to get to Michigan.

4.1.1 Blue Water Service

The Blue Water service is a daily single train in each direction. The westbound service departs Port Huron at 6:20 a.m. with a late morning arrival in Chicago at 11:45 a.m. The return trip leaves Chicago at 4 p.m., arriving back at Port Huron at 11:31 p.m. The Blue Water service route [2] is 319 miles serving 11 stations that operate over lines owned by three railroads and the State of Michigan: Canadian National (159 miles), Norfolk Southern (39 miles), Amtrak (99 miles), and MDOT (22 miles).

4.1.2 Pere Marquette Service

Like the Blue Water service, the Pere Marquette is a daily single service with one train in each direction between Grand Rapids and Chicago, operating on 176 route miles. The trains serve five stations. The westbound train to Chicago departs Grand Rapids at 6 a.m., arriving in Chicago at 9:08 a.m. The return train departs Chicago at 6:30 p.m., which is convenient for a business day trip or a weekend shopping or entertainment trip.[3] Of the three services, the Pere Marquette is the only one that does not operate over track owned by MDOT. It uses lines owned by CSX (135 miles) and Norfolk Southern (39 miles).

4.1.3 Wolverine Service

The Wolverine, connecting Pontiac and Chicago, comprises three daily round trips.[4] Two westbound trains operate in the morning, with one leaving Pontiac at 5:43 a.m. (departing Detroit at 6:27 a.m.) and arriving in Chicago at 10:33 a.m. and the other departing Pontiac nearly four hours later at 9:38 a.m. (departing Detroit at 10:24 a.m.) and arriving in Chicago at 2:51 in the afternoon. A third westbound train operates in the evening, leaving Pontiac at 5:28 p.m. (Detroit at 6:12 p.m.) and reaching Chicago at 10:41 p.m.

The eastbound operation has departures from Chicago at 7:20 a.m., 1:25 p.m., and 5:50 p.m. with arrivals in Pontiac at 2:47 p.m., 8:40 p.m., and 1:02 a.m. The corresponding Detroit arrival times are 2:01 p.m., 7:51 p.m., and 12:11 a.m.[5] Similar to Blue Water service, the Wolverine operates over track owned by Canadian National (27 miles), Norfolk Southern (39 miles), Amtrak (99 miles), and MDOT (134 miles).

[2] Amtrak departure and arrival times are consistent with July 2019 schedule (pre-COVID). These may be adjusted over time.
[3] Amtrak departure and arrival times are consistent with July 2019 schedule (pre-COVID). These may be adjusted over time.
[4] Amtrak temporarily reduced its service to one train per day in each direction due to COVID-19.
[5] Amtrak departure and arrival times are consistent with July 2019 schedule (pre-COVID). These may be adjusted over time.

4.1.4 Amtrak Thruway Motorcoach Service

Amtrak also provides a connecting bus service branded as Amtrak Thruway Motorcoach, using locally contracted intercity buses. The Amtrak Thruway Motorcoach service extends Amtrak's network by 1,470 miles within Michigan. Figure 43 shows the extent of the network. Each of the bus services connects to Amtrak in Michigan except for the route serving Hancock and other Upper Peninsula locations. The connection with Amtrak for this bus service is in Milwaukee.

The Amtrak Thruway Motorcoach system provides guaranteed connections to Amtrak trains as well as through ticketing. Its routes are incorporated into Amtrak's online and printed schedules.

Figure 43. Extended Michigan Amtrak Network with Thruway Motorcoach Connections

4.2 MICHIGAN PASSENGER RAIL SYSTEM STATIONS

A significant part of the population of Michigan has access to intercity passenger rail transportation. Very few residents do not have access to the state's passenger rail services.

4.2.1 Stations-Services

Access to Michigan's passenger rail system is provided by 22 stations: three in urban areas, 11 in suburban areas, and eight in rural towns. The Wolverine serves the most Michigan locations (12 stations), followed by the Blue Water (10 stations) and the Pere Marquette (four stations), as listed in Table 7.

Table 7. Amtrak Services-Michigan Stations Served

Amtrak Service	Stations Served
Wolverine	Albion
	Ann Arbor
	Troy
	Battle Creek
	Dearborn
	Detroit
	Dowagiac
	Jackson
	Kalamazoo
	New Buffalo
	Niles
	Pontiac
	Royal Oak
Blue Water	Battle Creek
	Dowagiac
	Durand
	Flint
	Kalamazoo
	East Lansing
	Lapeer
	New Buffalo
	Niles
	Port Huron
Pere Marquette	Grand Rapids
	Holland
	Bangor
	St. Joseph

Five Michigan stations are served by two services: Battle Creek, Dowagiac, Kalamazoo, New Buffalo, and Niles.

The appendix includes profiles of the Michigan passenger stations. Station ownership is a mix of parties owning a mix of assets. The State of Michigan, through MDOT, participates in the ownership of eight stations (principally owning platforms and track), and owns the Detroit and Pontiac Station buildings. Amtrak has an ownership stake in seven stations, either in the station building itself or some element of the overall facility, such as the platform(s), track, or other. Local governments, local transit authorities, the freight railroads, and Michigan State University own elements of stations.

4.2.2 **Stations-Connectivity**

4.2.2.1 Intermodal Connectivity

Intermodal connectivity is provided in several forms with several stations having multiple means of access.

- **Personal Vehicle Access-Parking**: All stations have free parking facilities, except for East Lansing and Kalamazoo, which charge parking fees. Other than Lapeer, overnight parking is permitted at all stations.
- **Local Transit Connections**: Albion is the only station without public transit connections. Transit connections range from streetcars (Detroit) to local bus service to dial-a-ride transit.
- **Intercity Bus Connections:** Thirteen of Michigan's passenger rail stations have connections with intercity bus services. Several bus operators serve passenger rail stations in the state. Bus lines serving the rail stations include Baron Bus Line, Greyhound, Indian Trails, and Miller Transportation, as well as Amtrak Thruway Motorcoach.
- **Active Transportation Connectivity**: Seven stations have bike storage.
- **Ride Sharing and Taxis:** Taxi cabs and on call services such as Uber and Lyft.

4.2.2.2 Station Structures

All but two stations, New Buffalo and Royal Oak, are buildings. These other two stations have covered, open platforms providing some protection from inclement weather. Many stations are intermodal facilities offering bus connections.

4.2.2.3 Ticketing Service

Although online ticketing and e-tickets are increasing in their acceptance and use, many travelers are still more comfortable with hard copy tickets. Four of Michigan's stations (Ann Arbor, Battle Creek, Dearborn, and Detroit) have manned ticket offices. Of the remaining stations, eight have ticketing machines while 10 have no ticketing capability.

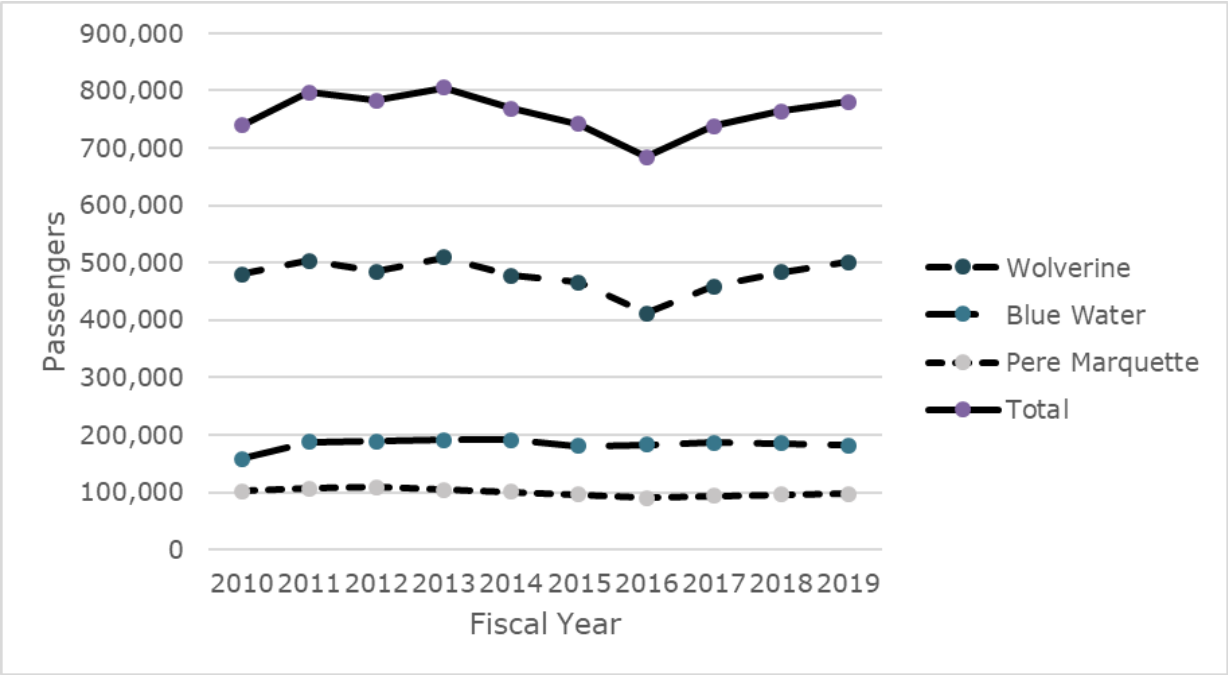
4.3 MICHIGAN PASSENGER RAIL RIDERSHIP

4.3.1 Passenger Rail Ridership Characteristics

4.3.1.1 Ridership by Service

Overall ridership grew during the Fiscal Year (FY) 2010-2019 period, from 739,000 to 780,000, although the growth was not without variability. Ridership peaked at 804,000 in FY 2013 only to decrease to 684,00 over the next three years. Following that decrease, ridership steadily increased to FY 2019.

Figure 44. Passenger Rail Ridership



The variation in overall ridership in the state was attributable to the variability of the Wolverine ridership. The Wolverine accounted for the majority of Michigan's passenger rail ridership, 64 percent of the passengers in FY 2019. Wolverine ridership grew from 478,000 passengers in FY 2010 to 501,000 passengers in FY 2019. Ridership on the two other services demonstrated a decreasing trend over the period. After an increase in Blue Water ridership in FY 2011 from 158,000 passengers in the prior year to 187,000 passengers, ridership remained relatively flat. However, ridership decreased slightly in FY 2019. Ridership on the Pere Marquette grew between FY 2010 and 2012, but decreased in FY 2019, not yet recovering to its FY 2010 level.

4.3.1.2 Passenger Rail Market

Table 8 shows the most traveled city pairs. Ridership is heavily focused on the Chicago market. No intermediate city pairs appear in the top 10. Ann Arbor-Kalamazoo (539 riders

per month) and East Lansing-Kalamazoo (425 riders per month) are the two leading intrastate travel pairs.

Table 8. Michigan Top City Pairs: Monthly Ridership FY 2019

Station	Station	Riders
Ann Arbor	Chicago	9,425
Dearborn	Chicago	4,533
Detroit	Chicago	4,521
Kalamazoo	Chicago	4,502
East Lansing	Chicago	4,411
Grand Rapids	Chicago	2,747
Holland	Chicago	2,665
Troy	Chicago	2,408
Battle Creek	Chicago	2,117
Flint	Chicago	1,789

The Michigan services play a significant role in Amtrak's Chicago market. Table 9 shows the leading markets for Chicago Amtrak service. Based on ridership, three Michigan locations are in the top 10. Ann Arbor is a significant revenue generator.

Table 9. Chicago Top City Pairs: Ridership and Revenues

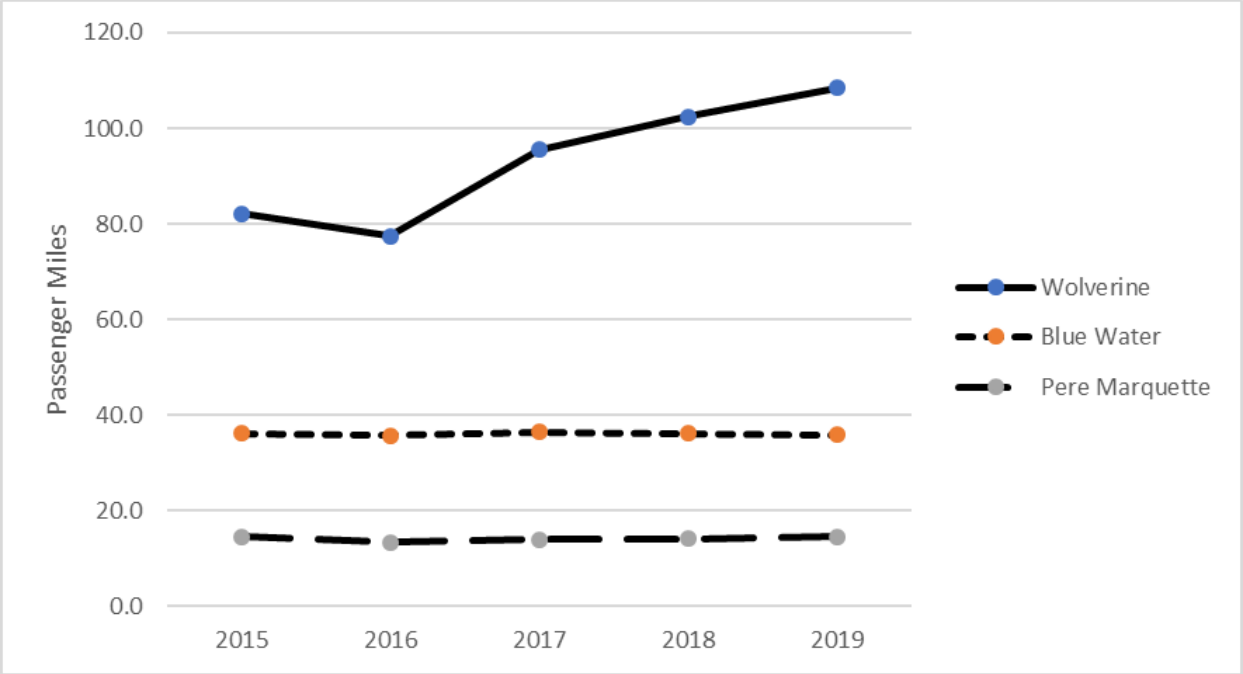
Chicago Top City Pairs: Ridership	Chicago Top City Pairs: Revenues
Milwaukee	Milwaukee
St. Louis	St. Louis
Milwaukee Airport	Washington, D.C.
Normal, IL	Los Angeles
Champaign, IL	Emeryville, CA
Ann Arbor	Ann Arbor
Springfield, IL	Seattle
Kalamazoo	New York
Sturtevant, WI	Denver
Dearborn	Milwaukee Airport

4.3.2 Michigan Passenger Rail System Utilization

4.3.2.1 Service Utilization

In 2019, the three Michigan passenger rail services produced more than 159 million passenger-miles, growing 20 percent from 2015. Figure 45 shows annual passenger-miles for each service.

Figure 45. Michigan Amtrak Service: Passenger-Miles (2015 to 2019)

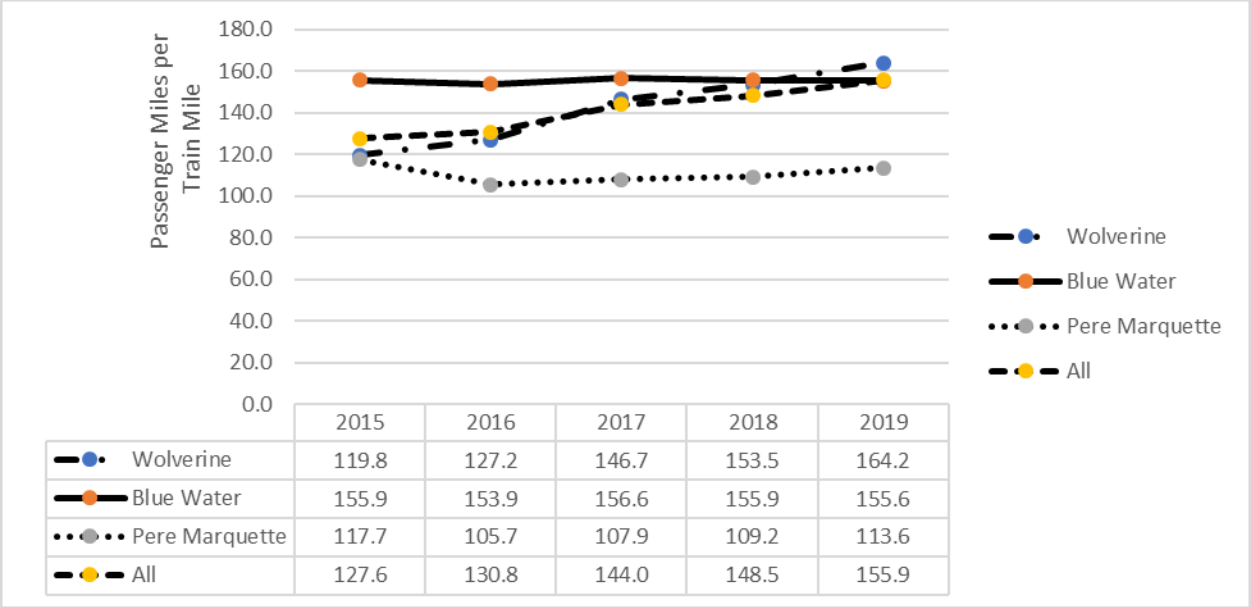


Over the past five years, the Blue Water and Pere Marquette services' annual passenger-miles have remained reasonably constant. The Blue Water service passenger-miles have been around 36 million per year, some years slightly above and others slightly below. Pere Marquette annual passenger-miles between 2015 and 2019 hovered around 14 million.

The Wolverine service, on the other hand, showed significant and steady growth since 2015. After a fall off in miles in 2016, passenger-miles increased each year. Compound annual growth was 7.2 percent from 2015 to 2019.

Figure 46 compares the utilization of each service measured as the number of passenger-miles per train-mile, or average passengers per train over the entire routes.

Figure 46. Michigan Amtrak Service: Train Utilization (2015 to 2019)



	2015	2016	2017	2018	2019
Wolverine	119.8	127.2	146.7	153.5	164.2
Blue Water	155.9	153.9	156.6	155.9	155.6
Pere Marquette	117.7	105.7	107.9	109.2	113.6
All	127.6	130.8	144.0	148.5	155.9

The Blue Water has been the service with the most consistent utilization, and until 2019 led the services in passenger-miles per train-mile when the Wolverine service surpassed it. The Wolverine has demonstrated increases in passenger utilization, growing from 119.8 passenger-miles per train-mile to 164.2 passenger-miles per train-mile, an improvement of 37 percent since 2015.

4.3.2.2 Station Use

While no metric is available to measure utilization, train boardings and alightings over time provide some insight into station utilization trends. The following three tables present station activity for FY 2015 and 2019 for each service ranked by compound annual growth.

The Wolverine experienced favorable growth at its stations with its greatest passenger activity. Troy led in growth with the stations with greater activity, with Detroit, Chicago, and Ann Arbor also experiencing significant annual growth. Two larger stations, Dearborn and Kalamazoo, experienced modest declines in passenger activity.

Table 10. Wolverine Service: Station Boardings and Alightings

Station	Station Passengers		Compound Annual Growth
	FY 2015	FY 2019	
Troy, MI	22,384	36,486	13.0%
Albion, MI	1,816	2,295	6.0%
New Buffalo, MI	12,422	15,408	5.5%
Detroit, MI	61,497	72,314	4.1%
Chicago, IL	389,155	430,155	2.5%
Ann Arbor, MI	143,130	156,674	2.3%
Dearborn, MI	76,537	74,623	-0.6%

Station	Station Passengers		Compound Annual Growth
	FY 2015	FY 2019	
Kalamazoo, MI	88,244	85,471	-0.8%
Pontiac, MI	15,876	15,339	-0.9%
Michigan City, IN	3,783	3,398	-2.6%
Battle Creek, MI	32,974	29,585	-2.7%
Jackson, MI	26,674	23,651	-3.0%
Niles, MI	12,629	11,009	-3.4%
Royal Oak, MI	33,694	27,693	-4.8%
Dowagiac, MI	2,042	1,587	-6.1%
Hammond-Whiting, IN	7,463	5,168	-8.8%
TOTAL	**930,320**	**990,856**	**1.6%**

Dowagiac, a smaller station, experienced the greatest growth of the Blue Water service at 7.5 percent shown Table 11. The two stations with most passenger traffic, East Lansing and Chicago, had the greatest percentage growth at 1.4 percent and 0.6 percent, respectively. Port Huron had the greatest drop in passenger traffic.

Table 11. Blue Water Service: Station Boardings and Alightings

Station	Station Passengers		Compound Annual Growth
	FY 2015	FY 2019	
Dowagiac, MI	2,432	3,252	7.5%
New Buffalo, MI	9,489	10,685	3.0%
Battle Creek, MI	9,920	10,673	1.8%
East Lansing, MI	65,355	69,210	1.4%
Chicago, IL	158,809	162,429	0.6%
Durand, MI	13,577	13,622	0.1%
Kalamazoo, MI	29,483	28,673	-0.7%
Lapeer, MI	9,527	9,008	-1.4%
Flint, MI	32,197	27,881	-3.5%
Niles, MI	6,466	5,583	-3.6%
Port Huron, MI	23,979	18,482	-6.3%
TOTAL	**361,234**	**359,498**	**-0.1%**

Similar to the Blue Water, one of the less used stations served by Pere Marquette service, St. Joseph, had the greatest growth between FY 2015 and 2019. Chicago, the largest station, had minimal growth while the second largest station, Grand Rapids, showed a decline in number of passengers over the period.

Table 12. Station Pere Marquette: Boardings and Alightings

Station	Station Passengers		Compound Annual Growth
	FY 2015	FY 2019	
St. Joseph, MI	11,976	14,668	5.2%
Bangor, MI	3,895	4,584	4.2%
Chicago, IL	94,500	95,845	0.4%
Holland, MI	36,994	37,292	0.2%
Grand Rapids, MI	44,249	40,593	-2.1%
TOTAL	**191,614**	**192,982**	**0.2%**

4.4 PASSENGER RAIL PERFORMANCE

4.4.1 Financial Performance

One of the more important metrics is the farebox recovery ratio since it measures the extent that passenger ticket revenues cover operation expenses. It is similar to the operating ratio used by freight railroads.

Table 13. 2019 Michigan Passenger Services Farebox Recovery Ratio

	Ticket Revenue ($000s)	Operating Cost ($000s)	Farebox Recovery Ratio
Blue Water	$6,263.8	$11,068.6	57%
Pere Marquette	$3,276.8	$5,513.7	59%
Wolverine	$22,606.7	$29,360.9	77%
TOTAL	**$32,147.2**	**$45,943.2**	**70%**

As shown in Table 13, the Michigan services, overall, recover 70 percent of operating costs. The Wolverine performs the best of all services at 77 percent.

Table 14 provides another perspective on financial performance of Michigan passenger rail services, the shortfall in revenue per passenger based on the average passenger fares. It measures the required subsidy per passenger to financially break even. Statewide revenues fall short by $17.67 per passenger.

Table 14. 2019 Revenue Shortfall Per Passenger

	Ticket Revenue (Average Fare)	Average Operating Cost Per Passenger	Revenue Shortfall Per Passenger
Blue Water	$34.45	$60.87	($26.42)
Pere Marquette	$33.58	$56.50	($22.92)
Wolverine	$45.11	$58.59	($13.48)
TOTAL	**$41.19**	**$58.86**	**($17.67)**

A complementary performance metric is the revenue shortfall per passenger-mile traveled. It is similar to the revenue shortfall per passenger; however, it considers the distance

passengers travel. Referring to Table 15, the combined Michigan services incur a shortfall of $0.09 per passenger-mile, with the Blue Water and Pere Marquette services having the greatest shortfalls. It should be noted that when miles are considered, the Pere Marquette has the greatest shortfall, whereas the Blue Water has the greatest shortfall when miles are not considered.

Table 15. 2019 Revenue Shortfall Per Passenger-Mile

	Revenue Per Passenger-Mile	Operating Cost Per Passenger-Mile	Shortfall Per Passenger-Mile
Blue Water	$0.17	$0.31	($0.13)
Pere Marquette	$0.22	$0.38	($0.15)
Wolverine	$0.21	$0.27	($0.06)
TOTAL	**$0.20**	**$0.29**	**($0.09)**

A third way to measure financial performance is the revenue shortfall per train-mile. The Blue Water had the largest shortfall.

Table 16. 2019 Revenue Shortfall Per Train-Mile

	Revenue Per Train-Mile	Operating Cost Per Train-Mile	Shortfall Per Train-Mile
Blue Water	$27.20	$48.07	($20.87)
Pere Marquette	$25.55	$42.99	($17.44)
Wolverine	$34.21	$44.42	($10.22)
TOTAL	**$31.53**	**$45.07**	**($13.53)**

4.4.2 Operating Performance

Complementing financial performance is operating performance. Table 17 shows the change in train speed between FY 2008 and the 12-month period ending third quarter FY 2019, as published by the FRA in its *Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, FY 2019 Q3*, the last volume published.

Table 17. Change in Effective Speed (FY 2018 Q4 to FY 2019 Q3)

Service	Change in Effective Speed from FY 2008 Baseline
Blue Water	7.4
Pere Marquette	3.4
Wolverine	4.7

Source: Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, FY 2019 Q3

Train speeds of each Michigan service improved since the base year FY 2008. The Blue Water had the most significant improvement.

4.4.3 Service Performance

4.4.3.1 On-Time Performance Metrics

The FRA publishes several metrics that measure performance from the perspective of the rail customer. Table 18 presents the percentage of trains arriving on time at the final destination. On-time performance is defined as a train reaching its ultimate destination within 15 minutes of scheduled arrival. The Pere Marquette had the best on-time performance at 69.2 percent of its arrivals, while the Wolverine at 30.8 percent had the worst performance of the three services.

Table 18. Endpoint OTP, FY 2019 Q3

Route	Endpoints	Percentage On-time Performance at Endpoint Stations
Blue Water	Chicago and Port Huron	53.8%*
Pere Marquette	Chicago and Grand Rapids	69.2%*
Wolverine	Chicago and Pontiac	30.8%*

Source: Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, FY 2019 Q3

* indicates the Passenger Rail Investment and Improvement Act of 2008 standard was not met.

PRIIA established an 80 percent on-time arrival rate as a standard. As shown in Table 18, none of Michigan services met the PRIIA performance standard during the period.

Looking at all 24 non-Northeast Corridor (NEC) Amtrak corridor routes, only seven met the 80 percent standard for the period. The median on-time performance was 72.4 percent.

Another way of measuring service reliability is on-time performance at each station. Table 19 shows the on-time performance for all stations of the Michigan routes. The Pere Marquette, at 75.1 percent on-time arrivals, operated close to standard and above the median of 74.2 percent of the non-NEC corridors. As with the endpoint performance, seven non-NEC corridors exceeded the standard.

Table 19. On-Time Performance for All Stations of Michigan Routes, FY 2019 Q3

Route	Percentage On-time Performance
Blue Water	62.0%*
Pere Marquette	75.1%*
Wolverine	46.6%*

Source: Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, FY 2019 Q3

* indicates the Passenger Rail Investment and Improvement Act of 2008 standard was not met.

4.4.3.2 Causes of Performance Deficiencies

Table 20 shows the two leading causes of Amtrak-attributable train delays for each service during the third quarter FY 2019 and total minutes of delay per 10,000 train-miles, as well as amount of delay attributable to the leading causes. The table also includes a calculation

of the number of trains for each service represented by 10,000 train-miles and, based on that, the average minutes of delay per train.

Table 20. Total Delay and Top Two Largest Delay Codes for Amtrak-Responsible Delays, in Minutes of Delay per 10,000 Train-Miles (FY 2019 Q3)

Route	Number of Train Equivalents	Total Delay Average Delay (min)	Largest Two Delay Codes			
			#1	Delay (min)	#2	Delay (min)
Blue Water	31	541* 17 minutes per train	Unable to make normal speed, etc.	140	Delays related to crews, including lateness, lone-engineer delays	121
Pere Marquette	56	386* 7 minutes per train	Delays related to crews including lateness, lone-engineer delays	114	Unable to make normal speed, etc.	114
Wolverine	33	822* 25 minutes per rain	Delays related to crews including lateness, lone-engineer delays	239	Unable to make normal speed, etc.	239

Source: Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, FY 2019 Q3

* indicates the Passenger Rail Investment and Improvement Act of 2008 standard was not met.

All services experienced Amtrak-caused delays longer than the standard of 325 minutes per 10,000 train-miles. The Wolverine experienced the greatest delay, with 822 minutes per 10,000 train-miles during third quarter FY 2019 for an average of 25 minutes per train equivalent. The major cause of delay was attributable to crew matters such as lateness or unavailability of full crews, followed by trains not able to maintain normal speeds.

Table 21 displays delay minutes attributable to the host railroad, or in the case of the State of Michigan-owned line between Kalamazoo and Dearborn, which is maintained and dispatched by Amtrak, MDOT. Total minutes of delay exceeded the standard for each host, except MDOT itself. The standard is 900.

Table 21. Total Delay and Top Two Largest Delay Codes for Host-Responsible Delays, in Minutes of Delay per 10,000 Train-Miles, FY 2019 Q3

Route	Host	Route Miles	Total Delay (min)	Principal Delay	
				Delay Type	Delay (min)
Blue Water	Amtrak	99	1,047*	Slow Order Delays	566
	CN	159	993*	Freight-Train Interference	771
	MDOT	22	614	Signal Delays	519
	NS	39	3,502*	Freight-Train Interference	2,588
Pere Marquette	CSX	135	473	Slow-Order Delays	250
	NS	39	3,235*	Freight-Train Interference	2,229
Wolverine	Amtrak	99	1,288*	Slow-Order Delays	624
	CN	27	2,633*	Freight-Train Interference	1,049
	MDOT	134	792	Passenger-Train Interference	365
	NS	39	3,737*	Freight-Train Interference	2,511

Source: Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, FY 2019 Q3

* indicates the Passenger Rail Investment and Improvement Act of 2008 standard was not met.

Freight train interference was the principal cause of delay for each service. Norfolk Southern was responsible for the highest number of delay minutes per 10,000 train-miles, exceeding 3,000 minutes for each Michigan route.

4.4.4 Customer Satisfaction

Table 22 summarizes customer satisfaction for each service based on an FRA survey. The Pere Marquette has the highest overall customer satisfaction score of the three Michigan services and exceeds the standard. It was below standard for onboard cleanliness and food service. The other two services also scored below standard for the food service. The Blue Water did not meet standard for any category; the Wolverine was better than standard for its personnel.

Table 22. Customer Satisfaction Indicator Scores, FY 2019 Q3

Service Metric	Standard	Routes		
		Blue Water	Pere Marquette	Wolverine
Overall Service	82	74*	82	69*
Amtrak Personnel	80	78*	88	84
Information Given	80	68*	80	69*
Onboard Comfort	80	75*	81	74*
Onboard Cleanliness	80	70*	74*	61*
Onboard Food Service	80	62*	67*	60*

Source: Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, FY 2019 Q3

* indicates the Passenger Rail Investment and Improvement Act of 2008 standard was not met.

5. Freight Rail Issues, Opportunities, Proposed Investments, and Improvements

Issues and opportunities were identified during the preparation of MM2045 through consultation with stakeholders, review and collection of information on the condition of Michigan's rail lines, and assessment of trends that currently or will affect Michigan's rail network. Some of these issues and opportunities relate to Michigan's geography and location in the U.S. rail network. Michigan is often considered a "peninsula state," bounded on multiple sides by Great Lakes in both the Upper and Lower peninsulas. Michigan is also bounded by the U.S. border with Canada. Several stakeholders emphasized the transportation challenges of peninsulas, where transportation networks, including rail, are not supported by through-freight movements but only traffic originating or terminating on the peninsulas. On the other hand, when seen from a North American perspective, Michigan is a gateway. This is apparent from the rail network, where the state's busiest rail line links populous regions of Canada with the U.S. Midwest and points beyond. In many cases, investments and improvements have been proposed to address freight rail issues and opportunities. Several topics became apparent during preparation of the plan:

- Recognizing that changes in commodity markets can create opportunities and threats to railroad transportation.
- Improving access to Michigan's rail network through transload and direct access to industrial sites.
- Securing adequate supply of railcars.
- Improving the condition of low-density railroad corridors in Michigan and ensuring continued operation of these lines.
- Promoting rail opportunities while recognizing private-sector business strategies.
- Promoting Michigan's role within the North American intermodal network.
- Reducing conflicts between freight rail and passenger rail, roadway traffic at crossings, incompatible land uses, and improve safety.

5.1 CHANGES IN RAIL MARKETS

Changes in demand for commodities that are shipped by rail will create both opportunities and threats for Michigan's rail network that will need to be addressed. New mining operations and new value-added activities associated with forest products could provide future opportunities for freight rail in the Upper Peninsula. A new gypsum mine, new grain processing facilities, new automotive-related manufacturing facilities, and other developments could offer rail opportunities in the Lower Peninsula. In Michigan as elsewhere in the nation, propane appears to be a growth commodity for rail.

Through the Michigan Rail Loan Assistance Program and the Freight Economic Development Program, MDOT has the capability to assist private-sector partners in ensuring the state takes full advantage of these changes in rail markets. The Michigan Rail Loan Assistance Program can provide no-interest loans, primarily to railroads, for rail improvement projects, and the Freight Economic Development Program can provide assistance to new or expanding rail customers with up to 50 percent of the costs associated with rail infrastructure on their property.

The energy sector has been undergoing a restructuring that is affecting the demand for freight rail transportation. Environmental concerns and inexpensive natural gas led to the conversion of coal-powered electric utility plants to natural gas. Historically, coal has been a leading product shipped by rail. Conversely, natural gas is delivered by pipeline.

The J. H. Campbell Generating Plant is one of the largest single users of railroad transportation in Michigan, receiving coal by rail to fuel the plant. The owner of the plant, Consumers Energy Co., has investigated the possibility of retiring the plant as early as 2025. The closure of this power plant would dramatically decrease the amount of freight that uses the CSX rail line serving the plant in western Michigan. This is a potential problem. Without the coal revenue, the line may be less viable.

5.2 TRANSLOAD OPPORTUNITIES

During outreach for MM2045, stakeholders were enthusiastic about additional transload facilities on the rail network. They can provide a low-cost way for shippers to save on transportation costs when traffic is otherwise entirely trucked. Transloading allows customers to access the benefits of railroad transportation without rail infrastructure at their own sites, especially if their volumes would not justify investment in direct rail access. Transloading can also allow customers to benefit from rail until such time as investment in a direct rail connection can be justified.

Transload facilities can also help to consolidate rail demand in situations where rail traffic would otherwise be dispersed such that no one site could justify service. Shipments, however, would need to be destined to relatively distant markets. Study of transload opportunities in the Upper Peninsula found that most transload operations were viable only for shipping long distances, such as to the Minneapolis/St. Paul area or beyond.[6] A steel shipper echoed the point that transloading is only feasible over longer lengths of haul.

A potential opportunity identified by a stakeholder is log shipping in north Michigan. Logs are generally shipped to processing facilities by truck. Because timber harvesting is dispersed and varies by season and year, a rail siding at a specific location cannot be justified. However, if enough shippers could coordinate their shipping requirements and use

[6] Irfan Rasul of Michigan Technological University, *Evaluation of Potential Transload Facility Locations in the Upper Peninsula (UP) of Michigan,* 2014.

a multi-shipper transload facility, a common facility may generate enough traffic to justify rail service.

At present, transloading would not be feasible since typical moves are only about 250 miles. The added cost of transferring freight between truck and rail would push the cost of a truck-rail service above that of the cost of trucking alone.

While more transload facilities could be valuable additions to Michigan's rail network, they would only benefit longer distance moves.

As part of development of MM2045, railroads identified eight projects at a total cost of $10.2 million to improve or establish transload facilities. They are included in the rail investment plan. MDOT can assist railroads and other transportation providers to establish, upgrade, plan, or improve transload facilities through the Freight Economic Development Program.

5.3 DIRECT RAIL ACCESS OPPORTUNITIES

There is also a need for more direct rail access to industrial sites, as well as improvements to existing shipper rail facilities. A steel shipper reported it would like to use more rail transportation but a number of its customers in the Detroit area are not directly served by rail. Rail lines are adjacent to customer locations but not connected to their facilities.

In determining improvements that would provide rail access to industrial sites, the type of rail lines that serve those locations is an important consideration. It is generally more expensive to build direct rail connections on high-speed, high-density rail mainlines than low-speed, light-density branch lines. As an example, providing new freight rail access on the state's accelerated rail corridor in which passenger-train speeds can reach 110 mph would require complex and costly changes. To access the Michigan Line,[7] freight trains may need to enter and leave the line at higher speeds, which would require expensive switches, possibly long access tracks and modifications to positive train control (PTC) systems. If the Michigan Line is to play a significant role in freight rail economic development, it may make the most sense to consolidate freight rail access, where feasible, so that multiple shippers share the cost of high-speed switches and long lengths of running track. MDOT's Freight Economic Development Program can help fund direct access to shippers, as well as rail-customer infrastructure necessary to directly access the rail system. MDOT is also committed to help offset some of the additional costs associated with the accelerated intercity passenger service on the Michigan Line that would otherwise be imposed on new freight customers.

Another potential use of the Freight Economic Development Program is the upgrading of shipper infrastructure to accommodate unit trains where there is sufficient demand. Unit

[7] The "Michigan Line," also referred to as the "Accelerated Corridor," refers to the MDOT-owned rail line between Kalamazoo and Dearborn.

trains carry a single commodity between origin and destination. Unit train service tends to be faster than manifest trains because trains operate point-to-point, avoiding intermediate classification yards.

Shipper facilities that handle unit trains require significant investment. A report conducted for MDOT in 2014 indicated a need for additional unit train capacity in the Michigan thumb area.[8] The report noted that arriving empty unit trains needed to be broken up and delivered in small lots to local grain elevators for loading. None of the elevators could accommodate an entire unit train. It would be more efficient if these trains could move directly to elevators without being broken up and reassembled. Additional unit loaders (elevators able to load a unit train) could boost the competitiveness of Michigan agriculture.

5.4 RAILCAR AVAILABILITY

Rail shippers in Michigan have reported shortages of certain types of railcars at certain times. These are driven by several dynamics:

- **Short-term fluctuations in railcar supply and demand**. At times, Michigan agricultural shippers have had difficulty obtaining railcars when needed. Rail shipments of grain in North America are seasonal, coinciding with harvests. Michigan's grain harvest begins later than in large production areas of the Midwest, such as in Illinois, Iowa, and Indiana. When Michigan producers start ordering railcars to handle their harvest, they sometimes find this equipment already in service, transporting harvests elsewhere.
- **Longer-term railcar availability.** As demand drops for certain types of railcars, these cease to be manufactured in sufficient quantity to replace those that will be retired. This is not a problem as long as previously manufactured railcars remain available. However, railcars, by law, can only be in service for 40 years, with up to two five-year extensions. Railcars more than 50 years old are not allowed to be interchanged between railroads. Forest product shippers in the Upper Peninsula are concerned about current and impending shortages of log cars. Many log cars are approaching the age at which they will need to be retired, and new log cars are not available to replace them. There is concern that a "chicken and egg" scenario may develop, whereby shippers do not use rail for log shipments because no railcars are available, and car manufacturers do not produce log cars because forestry producers are not shipping logs by rail.

For these issues, MDOT could play a facilitating role, helping private sector companies to organize and develop mutually advantageous solutions.

[8] Tioga Group, Inc. for the Michigan Department of Transportation, *The role of rail infrastructure in the economic development of Michigan's Lower Peninsula*, September 2014.

5.5 MICHIGAN'S LOW-DENSITY RAIL LINES

Rail transportation is subject to the economics of density; that is, rail lines that carry more freight are often more profitable than those that have less freight. Revenues accruing to a rail line vary directly with rail traffic volume. However, certain costs, such as expenditures for periodic long-term maintenance, do not fluctuate and vary only in part with traffic levels so that costs will be incurred irrespective of traffic volume. As an example, crossties, certain bridge components, and highway-rail grade crossing surfaces degrade over time whether a rail line carries traffic or not.

As with other states, within Michigan there is significant mileage of rail lines that has little traffic. In Michigan, 614 miles of active rail lines carry fewer than an annual average of 50 carloads per mile. Of these lines, all but 90 miles are operated by Class III railroads, which often have limited resources to invest in their rail infrastructure. Another 52 miles carry between 50 and 100 carloads per mile per year. At these traffic levels, it is difficult for railroads to cover all their long-term capital needs through their revenues. Low-density rail lines tend to be located in the north portion of the Lower Peninsula and in the Upper Peninsula, where there is low population density, and little, if any, through-freight traffic.

Several shippers located on low-density rail lines stressed the importance of maintaining these lines. In these areas of relatively sparse population, rail access is vital to local industries even though the volumes shipped are low. Within north Michigan, agriculture, mining, and forestry industries particularly rely on rail. While the maintenance of these lines can be challenging, their preservation is one measure of success in that it ensures that rail continues to be a modal option for those areas of the state.

As of the preparation of MM2045, Canadian National and Watco, Inc. have announced a deal where Watco will purchase from Canadian National the line from Munising to Trout Lake, and the line from Marengo Junction to White Pine in the Upper Peninsula. The lines carry little traffic. MDOT will want to monitor the situation to ensure continued rail service.

One measure of a rail line's condition is the FRA track classification, which dictates the maximum speed at which trains can operate. The lowest FRA standard of track is Class 1, whereby trains are limited to 10 mph. Railroads may also gain an exception from the FRA and not operate to FRA standards. Trains on excepted track are limited to 10 mph, cannot carry passengers, and cannot contain more than five cars of hazardous materials. In many cases, these areas of excepted track operate at a lower standard of maintenance than FRA Class 1. All railroads operating in Michigan were queried about the FRA classification of their tracks for MM2045. Based on those that responded, the Michigan rail network includes at least 172 miles of excepted track and at least 257 miles of Class 1 track. On the one hand, one would prefer that rail lines be maintained to a higher state of repair so that railroads can provide better service to current and prospective customers. On the other hand, rail lines are usually maintained to a condition consistent with current usage. When business grows, in most instances, lines can be quickly upgraded to meet those demands.

Figure 47. Example of Excepted Track

Source: MDOT

In the 1990s, the railroad industry adopted 286,000 pounds as the industry standard maximum gross weight of railcars. This was an increase from the previous standard of 263,000 pounds. Rail lines that are unable to accommodate 286,000-pound railcars present a competitive disadvantage to railroads and the shippers on those rail lines. The smaller railcars, which have lower capacities, are more costly to handle per ton shipped. Shippers often pay the same rates per carload regardless of railcar size, so that using a larger capacity 286,000-pound railcar allows the shipper to ship more tonnage per railcar, while paying the same rate. However, upgrades to rail lines and bridges to enable 286,000-pound railcars are costly. The Michigan rail system includes 410 route miles that are limited to 263,000-pound railcars.

As part of a survey conducted for MM2045, Michigan short-line railroad operators were asked to submit needed projects that could be considered for public-private partnerships. The railroads identified the following:

- Four projects to upgrade railroad tracks to modern standards, with a combined cost of $82.3 million. These projects included upgrades of rail from old, light, jointed rail to modern, heavier, continuously welded rail, upgrades of switches, rail yards, and increasing capacity to 286,000 pounds.
- Fifteen projects to improve railroad tracks and rail yards to a state of good repair, with a combined cost of $33.3 million.

- Nine projects to improve railroad bridges to a state of good repair, with a combined cost of $23.8 million.

Much of the 530 miles of freight corridors that MDOT owns has relatively low traffic density. Per the terms of the MDOT operating agreements for those corridors, operating railroads are responsible for ongoing maintenance. However, because the level of traffic on the lines does not always enable operators to cover all long-term investment needs, MDOT sometimes assists with capital improvements.[9]

Some railroad capital needs are short-term. For example, railroads typically replace ties at regular intervals to maintain safe operations. New ties are distributed in such a way that track segments are supported by an appropriate number of "good ties." Other capital needs are longer-term. Bridges and bridge components can remain in operation for long periods of time but eventually may require replacement or repair, which can be costly.

Figure 48. MDOT-Owned Manistee River Bridge

Source: MDOT

A total of 137 bridges are located on MDOT-owned freight rail lines (excluding the Michigan Line), and the management of these assets will be an important consideration in the future. The American Railway Engineering and Maintenance-of-Way Association recommends that railroad bridges have a service life of 75 years. Most of the bridges on MDOT-owned lines are at least 100 years old. This raises the concern of fatigue failures due to age. The lack of maintenance records from the predecessor railroads adds to the concern, as repair histories are unknown. Moreover, these bridges were built when railcars were much lighter than they are today and are not all able to accommodate 286,000-pound railcars. Starting in 2018, MDOT has been undertaking a detailed inspection and load-rating refresh for all in-service freight bridges to better understand the current state of the structures. MDOT has embarked on a project to replace one of its higher priority bridges, and other bridges have been identified for inclusion in a possible federal grant application.

[9] MDOT also owns 135 miles of the high-speed corridor dispatched by Amtrak, the Michigan Line. In addition to passenger trains, the Michigan Line also carries freight. MDOT funds all capital and maintenance work on the State of Michigan-owned segment of the Michigan Line.

5.6 WORKING WITH RAILROADS

Railroad transportation can provide public benefits, and public agencies are often supportive of infrastructure projects that increase the usage of rail. However, from the railroad perspective, partnering with the public sector on infrastructure projects that enable new rail services is only desirable if the contemplated rail services are profitable and consistent with corporate strategy.

Michigan's short-line railroads have an incentive to grow rail traffic because they typically have plenty of spare capacity, and revenues from additional traffic will help defray the costs of operating rail lines. Class I railroads, on the other hand, operate higher density rail lines and must consider whether the best usage of that capacity and whether proposed new traffic will provide as high a return as other potential traffic opportunities.

Class I railroads have an incentive to handle freight that travels longer distances on their systems since they earn more revenues from longer moves. As a result, most traffic on Class I railroads is relatively long distance. The average Norfolk Southern rail move was 539 miles in 2019, 562 miles for CSX, and 331 miles for Canadian National.[10] Furthermore, the Class I average length of haul has tended to increase over the years. For example, the average Norfolk Southern length of haul was 472 miles in 2000, 455 for CSX, and 255 miles for Canadian National, each significantly less than in 2019.

New traffic that short-line railroads would like to bring online is not always attractive to Class I interchange partners. One short-line representative interviewed for MM2045 indicated that less than half of the railroad's traffic prospects come to fruition due to uncompetitive pricing from Class I partners. As an example, some traffic would rely on Class I mainlines to access nearby locations in north Ohio or Indiana. From the Class I railroad perspective, these moves may consume valuable capacity that may be more profitably used by through-traffic traveling farther distances on their systems, such as between Chicago and the Northeast.

The availability of Class I capacity for short distance rail moves is particularly important in Michigan, given the state's proximity to Chicago, which is a national railroad hub. Shipments between Michigan and locations on western railroads (BNSF and Union Pacific) originate and terminate in Chicago, but in many cases do not continue by rail to/from Michigan because the length of haul is too short. While the total rail move between Michigan and locations on western railroads may be long, the portion carried by eastern Class I railroads, Norfolk Southern and CSX, may be short, which makes them costly and less desirable. Several shippers consulted for the preparation of MM2045 indicated transloading between truck and rail in Chicago as the only viable alternative to move freight by rail.

Class I willingness to participate in short-haul rail moves may also be influenced by the size and the relative importance of the railroad customer. A shipper that generates hundreds, if not thousands, of carloads per year may find railroads more willing to participate in short-

[10] From railroads' R-1 Annual Reports files with the U.S. Surface Transportation Board.

haul rail moves than those that ship several dozen carloads per year. These shippers have greater negotiating leverage and may be able to provide economics of density by shipping a high volume of carloads between specific origins and destinations. One major shipper interviewed for MM2045 was able to participate in short-haul rail moves that may have been infeasible for a small shipper. As MDOT funds or finances projects that enable new rail services, it encourages shippers to work with the serving railroad to first ensure that the new service is feasible and that the shipper is comfortable with the overall rail rates (including all carriers involved). There may be opportunities for new rail services where Class I participation is not necessary and a rail move involves multiple short-line railroads. However, one short-line stakeholder commented that Michigan's short-line network is too fragmented. A rail move may become unworkable if restrained by handoffs between railroads. MDOT could play a facilitating role, as short lines look for opportunities for better coordination. MDOT could also look for infrastructure opportunities that would make short-haul rail more desirable to Class I railroads and less disruptive to through-operations, such as through faster, more efficient interchanges and access.

5.7 INTERMODAL OPPORTUNITIES

5.7.1 Michigan's Role in the Intermodal Network

Michigan's role in the U.S. rail intermodal network is influenced by the state's location in the North American rail network and its industries. As the nation's 10th most populous state, with a large manufacturing industry, not only automotive but also other manufacturing subsectors such as chemicals, electronics, food products, furniture, forestry products, and metal products, Michigan is a large market for rail intermodal transportation.

According to the Surface Transportation Board Waybill Sample, Michigan received or shipped about 6 million tons of goods by intermodal container by rail in 2018. Per estimates from the TRANSEARCH database, Michigan shipped or received 3 million tons of goods by intermodal containers by truck to/from other parts of North America the same year. Put another way, two-thirds of the containers shipped to or from Michigan arrive or depart by rail and one-third moves by truck. The significant usage of truck drayage to bring containers to or from Michigan is driven by several factors:

- **Michigan's proximity to Chicago**. Chicago is Michigan's largest trading partner for intermodal, with 1.9 million containers flowing between Michigan and Chicago in 2018. More intermodal containers are shipped by truck between Michigan and the Chicago area than are shipped by rail, although the split is somewhat even, with more than 0.9 million shipped by both modes. During discussions with automotive manufacturers, the companies mentioned that they typically receive overseas shipments by rail intermodal to Detroit from East Coast ports. Conversely, containers from West Coast ports are shipped to Chicago and trucked to Detroit. Detroit is 280 miles from Chicago, which is within a one-day drive for a truck. This proximity can favor trucking over intermodal rail, so it is often more economical to truck between Detroit and Chicago rather than transfer

to an eastern railroad. Unfortunately, the need to transfer containers at Chicago, whether between two separate rail moves or between truck and rail, adds costs to Michigan shippers. Some Michigan traffic is interchanged at other gateways such as Memphis, St. Louis, and Kansas City, which could potentially improve efficiency. For Michigan shippers, it would be more efficient if rail shipments from points west could be shipped directly to Michigan without transferring and additional processing at intermediate gateways. Some movements between West Coast ports and Michigan do not require processing at Chicago, such as movements on the Canadian National lines from the Port of Vancouver and the Port of Prince Rupert. If railroads could make greater use of run-through agreements, this could also reduce the need for processing in Chicago.

- **Michigan's Status as a Peninsula State.** Michigan's largest trading partner for intermodal containers by truck (drayage traffic) is Ohio. Nearly 3 million containers moved between Ohio and Michigan in 2018, with most containers traveling between shippers or receivers in Michigan and intermodal ramps in Ohio. These containers travel to/from Michigan by truck because the state is north of the main Norfolk Southern and CSX intermodal routes, which pass through Ohio. Rather than ship directly to Michigan, containers are off-/on-loaded in Ohio and trucked to or from Michigan.

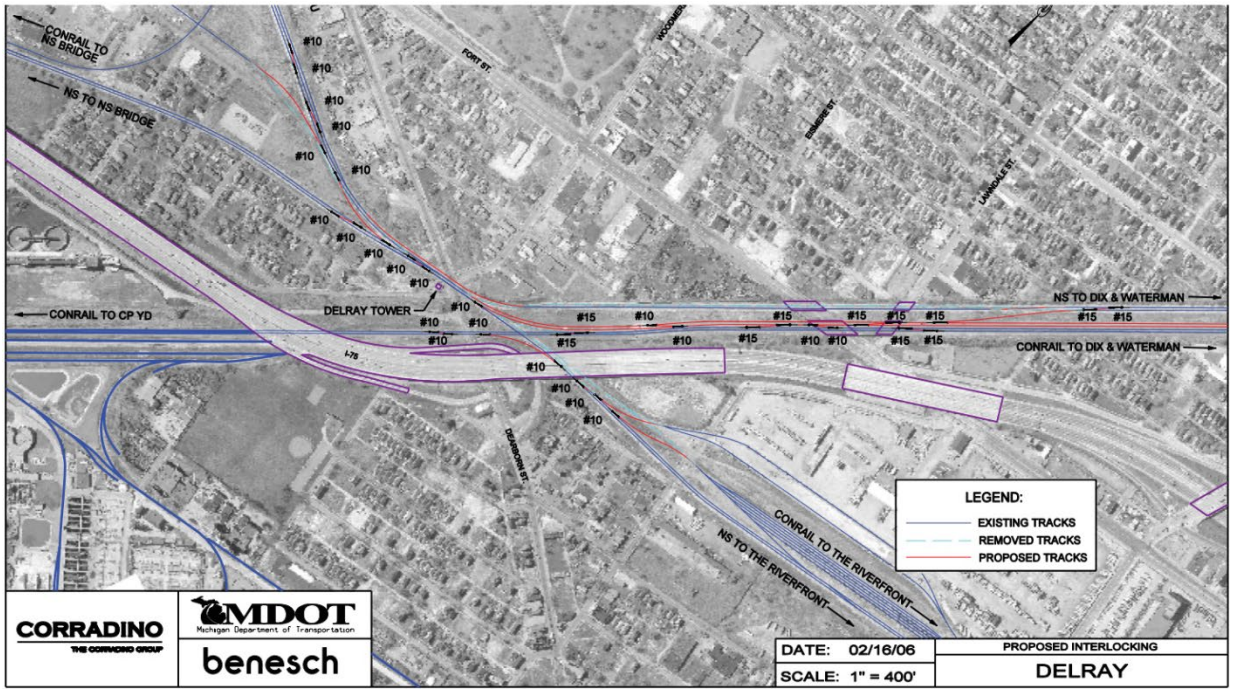
Both proximity to Chicago and Michigan's location off intermodal routes have hampered efforts to bring intermodal terminals to western Michigan. To address the lack of nearby intermodal terminals in Grand Rapids, representatives of the Grand Rapids business community have studied the possibility of establishing a new intermodal terminal in western Michigan. Grand Rapids would likely fulfill many of the criteria for establishing an intermodal facility as a metropolitan area with more than a million inhabitants and the potential for balanced inbound/outbound container flows. However, Grand Rapid's location is inefficient from the serving railroad's perspective, as it is not on an established intermodal route and is within 200 miles of the railroad's facilities in Chicago.

Michigan's connections with eastern intermodal connections serves as an opportunity as eastern international gateways grow. As described in the Baseline Trends report of MM2045, sources of imports from Asia are shifting to locations that favor importation through East Coast ports. Improvements to the Panama Canal have enhanced the economics of all-water liner services from Asia to East Coast ports, making West Coast ports coupled with land-bridge rail service less competitive in Southeast and Northeast markets. Canadian National is investing in its current intermodal service between the Port of Halifax and Montreal/Toronto. The service could be extended to Detroit. Canadian Pacific Railway (Canadian Pacific) acquired the Central Maine and Quebec Railway and has established intermodal service to the Port of St. John. Detroit is a western terminus of the portion of the Canadian Pacific network that does not travel north of the Great Lakes. The proposed purchase of KCS by a Canadian railroad could impact connections between Michigan and Mexico. These developments have the potential to strengthen Detroit's position as an intermodal rail hub.

5.7.2 Detroit Intermodal Improvements

To derive maximum benefits from these developments, the Detroit rail network needs to be improved. Starting in 2001, MDOT began an initiative to improve southeast Michigan's intermodal capabilities, the Detroit Intermodal Freight Terminal (DIFT) initiative. The DIFT project is intended to increase the capacity of the intermodal rail terminals in Detroit, as well as improve the efficiency of the road and rail networks that serve these terminals. During past discussions with the DIFT-participating railroads, several infrastructure improvements have been agreed upon as part of a first five-year plan. Of the total project improvements, $34.7 million have been spent or are underway, including the $16 million Delray interlocker (Figure 49), the West Detroit interlocker, and a track from Delray to Dix. The interlocker projects allow for more flexibility, the ability to hold trains, faster speeds, and few delays.

Figure 49. Delray Interlocker



Source: MDOT

Projects not yet completed as part of this five-year plan include the Waterman/Dix interlocker, the Canadian Pacific Yard interlocker. Another project that Norfolk Southern endorsed in discussions for MM2045 is to pave the Norfolk Southern portion of the Livernois Junction Yard.

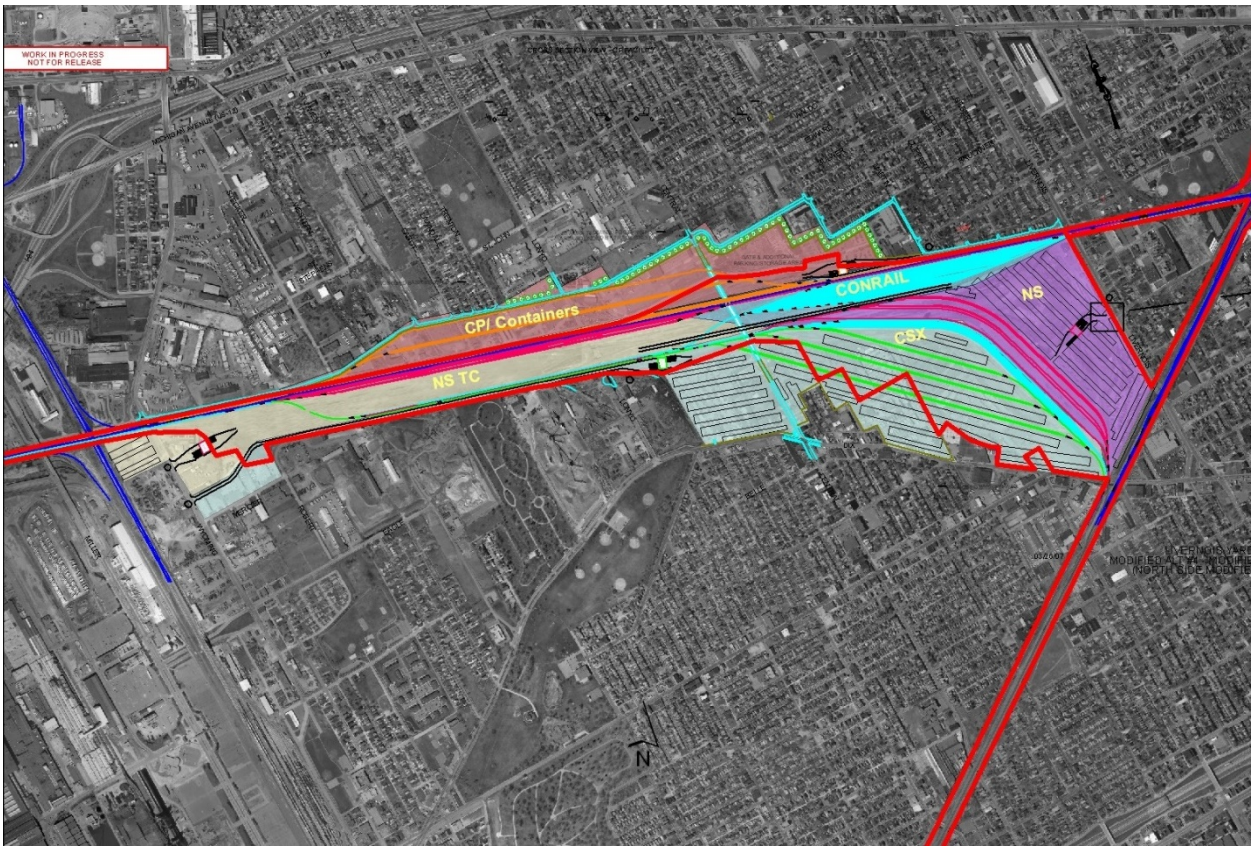
Other elements of DIFT were not yet formally prioritized by the railroads but their relative importance has been discussed during DIFT development meetings. Projects include the following:

- Expanding CSX and Norfolk Southern intermodal operations at the Livernois Junction Yard. Anticipated improvements would not only expand the number of containers that could be handled at the facility but would also provide an area where the railroads could build full-size intermodal trains.
- Relocating Canadian Pacific intermodal operations from its Oak Terminal to the Livernois Junction Yard.
- Upgrading additional interlockings.
- Improvements to roadway access to the Livernois Junction Yard. The project would also change the exit gate for the CSX portion of the yard so that it could more directly access the highway and not travel residential streets.

The total DIFT program is $539 million in 2011 dollars, with an anticipated public share of $380 million. Figure 50 shows the DIFT terminal improvements.

When asked to prioritize DIFT projects, Norfolk Southern not only endorsed the paving of the Livernois Junction Yard, but also recommended a project to add domestic intermodal service to Norfolk Southern service at the Livernois Junction Yard. This project would cost at least $50 million with a significant public contribution but could provide public benefits by diverting trucks from road to rail. The relationship between this project and previously planned DIFT improvements would need to be determined.

Figure 50. Detroit Intermodal Freight Terminal Layout



Source: MDOT

5.7.3 Detroit-Windsor Tunnel

Of additional concern for improving access to Detroit's intermodal rail network is the Canadian Pacific Detroit-Windsor tunnel. As mentioned in the MM2045 Existing Multimodal Conditions and Inventory report, one of the two tunnels has been heightened to accommodate double-stack international containers but cannot accommodate double-stack hi-cube domestic containers. Currently, rail service by Canadian Pacific serving Detroit uses international containers, but this could change, and there may be a need for unrestricted double-stack intermodal clearance.

Figure 51. Canadian Pacific Detroit-Windsor Tunnel

Source: MDOT

5.8 REDUCING PASSENGER-FREIGHT RAIL CONFLICTS

Freight rail transportation has the potential to hinder or be hindered by passenger rail service on shared lines. Several stakeholders noted areas where freight and passenger rail services could be better separated, reducing the potential for conflicts. As an example, the Michigan Line relies on 1.8 miles of Canadian National track in Battle Creek. Canadian National has suggested that it would improve both freight and passenger operations if passenger and freight trains could operate on separate tracks over this segment. MDOT staff have confirmed that many of the Amtrak train delays on the Michigan Line occur near where these trains pass over the Canadian National rail line in Battle Creek. MDOT has received a $750,000 grant for a $1.5 million initiative to complete design and environmental work to separate freight and passenger operations in this area.[11] Another area where stakeholders have mentioned the potential for conflicts between freight and passenger operations is the Wayne Diamond. This is a location where a double-track section of CSX crosses the MDOT-owned Michigan Line. While this area is not considered a bottleneck currently, it could become a chokepoint if freight or passenger rail traffic were to increase significantly.

[11] MDOT is contributing $375,000 to the engineering and design, as is Amtrak. The $750,000 federal grant funds the other 50 percent of the project.

5.9 REDUCING CONFLICTS AT HIGHWAY-RAIL GRADE CROSSINGS AND ADDITIONAL SAFETY MEASURES

MDOT continues to work on improving the safety of Michigan's rail system. MDOT administers the Railway-Highway (Section 130) Program, the federal program aimed at eliminating hazards at highway-rail grade crossings. Per the program's formula, Michigan received $8.1 million in FY 2019. MDOT also dedicates $3 million per year of state road funding toward highway-rail grade crossing safety issues. In 2020, MDOOT received a $15.6 million federal grant, which it matched with $14.6 million in state funds, to reduce the risks of trespasser accidents and to improve safety at select grade crossings on the Michigan Line between Kalamazoo and Dearborn.

Rail-related accidents and incidents have generally declined over the past 20 years. The frequency of train-automobile crashes at highway-rail grade crossings declined by nearly half between 2010 and 2019 compared to 2000 to 2009. Fatalities caused by trespassers struck by trains declined 14 percent during the same time period.

Despite these improvements, more work remains to improve the safety of Michigan's rail network. Another issue associated with highway-rail grade crossings relates to the extended blockages of some crossings by stationary trains. According to stakeholders, there are numerous other examples in Michigan of crossings that are frequently blocked by stationary trains. Blocked crossings are not only inconvenient but they also can represent a safety hazard by inhibiting emergency vehicles from responding to calls. Furthermore, if pedestrians become impatient waiting for a train to move, they may crawl through the train, thus risking being run over if the train starts to move.

5.10 REDUCING LAND USE CONFLICTS

Another potential area of conflict is land use. One railroad company consulted for MM2045 attempted to establish a new transload facility in a Michigan city but was not allowed to make roadway improvements to facilitate truck access into and out of the facility after a nearby university objected to the resultant truck traffic near the campus. In another instance, a railroad would like to build a transload facility at a site that, from a transportation access and layout perspective, would be an ideal location for a facility. However, local jurisdictions are unsure whether they would support logistics activities in this area or would prefer commercial/residential land uses. Although railroad transportation provides public benefits, such as reducing externalities associated with highway freight, supporting job-creating industries, it is important that rail-related industrial activities gain acceptance from local stakeholders and that these activities do not conflict with surrounding land uses. In some cases, railroads had operated in areas long before residential and other developments with which they are now coming into conflict. Developers should be discouraged from building in areas that will come into conflict with railroad operations.

6. Passenger Rail Issues, Opportunities, and Improvements

Intercity passenger rail transportation is important to Michigan. MDOT recognizes this and is committed to improving service in the state. This section of the plan identifies existing and future opportunities and needs, some of which are being addressed or are planned to be addressed by MDOT and Amtrak, the state's passenger rail service provider.

Passenger rail issues, opportunities, and improvements were drawn from joint MDOT-Amtrak planning documents and from discussions with the Michigan Association of Railroad Passengers (MARP). Many are long-range in their consideration of implementation. They are identified in this plan to provide a comprehensive catalogue on needs as identified by interested parties.

6.1 NEEDS CURRENTLY BEING ADDRESSED BY MDOT

The State of Michigan owns 135 miles of the Michigan Line connecting Chicago and Detroit. MDOT owns the line segment between Dearborn and Kalamazoo. The line is used by the Blue Water and Wolverine state-supported Amtrak services. MDOT has invested heavily in the line to upgrade it to a maximum passenger train speed of 110 mph.

MDOT and Amtrak have several projects to improve service on the Chicago-to-Detroit route, which is commonly referred to as the Michigan Line, funded and underway, or about to be underway. The projects include improved trackwork consisting of structures replacement, crossings, signalization, and safety. With the completion of the projects, transit time between Chicago and Pontiac will decrease to less than six hours. The projects are listed in the following sections.

6.1.1 Track and Tie Work Between Battle Creek and Dearborn

Project Description: This project replaces 15 miles of rail east of Jackson and approximately 80,000 railroad ties east of Battle Creek. Project also replaces two 100-year-old bridges in Jackson at Jackson Street and Mechanic Street.

Proposed Jackson Street bridge

Status: Trackwork is to begin in summer 2021 and continue into 2022. Bids for bridge work are due in summer 2021 with work planned for summer 2022.

Cost and Funding: Total cost is $54.9 million split among an FY 2018 federal State of Good Repair (SOGR) grant ($23.3 million), MDOT ($29.6 million), and Amtrak ($2 million).

6.1.2 Michigan Line Signal Improvements

Project Description: This project upgrades signals and other operating control system elements between Kalamazoo and Dearborn. Work includes improving signal components and turnouts, which will reduce frequent delays due to power outages, switch failures, and frozen switches. The signal components at control points will be renewed; 26 grade crossing gate mechanisms will be replaced along the Michigan Line that are beyond their useful life. Ten turnouts to customers served by the freight carriers in the corridor are deteriorated and will be replaced to maintain speed and safety on the Michigan Line.

Cost and Funding: Total cost is $13 million split among FY 2019 SOGR grant ($6.5 million), MDOT ($4.1 million), and Amtrak ($2.4 million).

Status: FRA preparing grant agreement; MDOT to draft funding agreement.

6.1.3 Michigan Line Trespass and Safety Improvements

Project Description: This project comprises infrastructure improvements designed to prevent pedestrian trespassing along the Michigan Line. MDOT has identified locations between Dearborn and Kalamazoo that have been prone to pedestrian-train incidents or where near-misses occur frequently. The project will include installing right of way fencing and tree clearing to deter trespassing. Pedestrian safety enhancements are proposed at select high foot-traffic areas to safely route pedestrians to where to cross the tracks. Each site has unique challenges. MDOT is working with Amtrak and local officials to effectively build the improvements needed to safeguard the public.

Cost and Funding: Total cost is $31.2 million split among a Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program grant ($15.6 million); MDOT ($14.6 million); and Amtrak ($1 million).

Status: FRA preparing grant agreement.

The combined improvements will increase safety, speed, and reliability on the Michigan Line. The schedule between Chicago and Pontiac will be less than six hours, eliminating the need to change crews at Battle Creek and the need for a crew base.

6.2 IMPROVED SERVICE AND FASTER TRAINS

On May 21, 2021, FRA approved train speeds up to 110 mph on the Michigan Line between Kalamazoo and Albion, effective May 25. Work continues on the line east of Albion to Dearborn with additional 110 mph segments to be added over the next three years. Several projects have been identified by MDOT and Amtrak to increase train speeds and further decrease travel times on the Michigan Line.

6.2.1 Curve Modifications: Jackson-Ann Arbor Ypsilanti

Project Description: With the completion of installation of PTC, Amtrak will be able to operate trains at speeds up to 110 mph in all state- and Amtrak-owned territory except for the 47.5 miles between Jackson and Ypsilanti, where Amtrak's operating speeds are limited by the existing horizontal track curvature. The project includes the modification of 42 horizontal curves, safety improvements at 16 public and eight private at-grade crossings, and installation of new rail between Ypsilanti and Jackson. Modification of curvature will permit operating speeds up to 110 mph.

Cost and Funding: Total cost is $31.1 million split among a FY 2020 SOGR grant ($15.5 million), MDOT ($12.6 million), and Amtrak ($3 million).

Status: 90 percent design complete.

6.2.2 Jackson Station Platform Reconfiguration

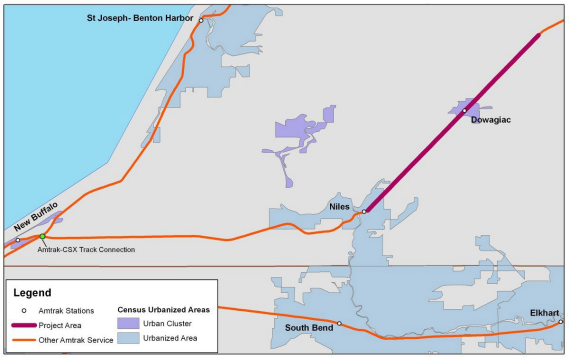
Project Description: The current center island platform of the Jackson station, the oldest station in continuous operation in the country, is prohibited from being used for safety reasons by FRA because of its inadequate width. Trains currently must use track adjacent to the station, which increases station dwell times as hinders train meets. The project would include (1) platform expansion, (2) track reconfiguration, (3) building a pedestrian overpass, and (4) a new parking lot.

Cost and Funding: $33.3 million; source of funding to be determined.

Status: MDOT to begin feasibility analysis.

6.2.3 Double-Track Installation: Niles-Glenwood Road

Project Description: This project will install 16 miles of new track between the Niles Amtrak station and Glenwood Road in Dowagiac, reducing travel times by five minutes over this segment of the Michigan Line.



Cost and Funding: $100.5 million; source of funding to be determined.

Status: Next step is to secure funding.

6.2.4 Ann Arbor Multimodal Station

Project Description: MDOT continues to work with the City of Ann Abor, FRA, and Amtrak to build a new station that is functional for both current and future multimodal demand.

Cost and Funding: To be determined

6.3 STATUS: NEXT STEP IS TO COMPLETE PE/NEPA PHASE.SEPARATION OF PASSENGER AND FREIGHT TRAINS

As described in the System Inventory section of this plan, conflicts between passenger services and freight services operating on the same lines are the largest contributor to passenger train delays in Michigan. Slower, longer freight trains, many having to serve customers along the right of way interfere with passenger trains and their ability to operate at scheduled speeds. MDOT and Amtrak have identified projects to separate passenger train operations from freight train operations.

6.3.1 Western Half of Battle Creek Connector

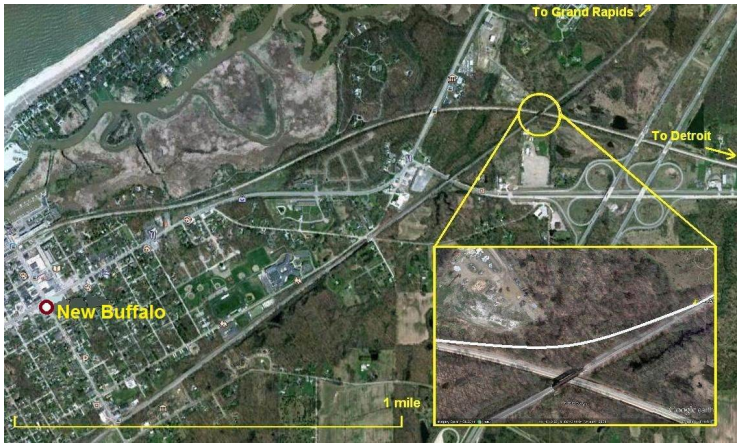
Project Description: This project will permit bypassing the Canadian National line at Battle Creek; work includes a new three-quarter mile bypass of the Canadian National line from Gord interlocking to a location just east of the Battle Creek station to Baron interlocking; new track will serve the Battle Creek station.

Cost and Funding: $28.2 million total cost, source of funding to be determined; $1.5 million PE/NEPA phase is funded - FY 2020 CRISI grant for preliminary engineering and National Environmental Policy Act (NEPA) analysis ($750,000) with both MDOT and Amtrak contributing $350,000..

Status: Preliminary engineering/NEPA analysis to begin; consideration is being given to an eastern half extension to a point beyond the Canadian National line to the east. The preliminary engineering/NEPA work will encompass new track, turnouts, grade crossings, and the rebuilding of the intercity passenger rail boarding platform at the Battle Creek Intermodal Terminal.

6.3.2 East of New Buffalo: CSX-Michigan Line Connector

Project Description: This project will build a new connector that will permit the Pere Marquette service to use the Amtrak Michigan Line for access to Chicago; adds Pere Marquette service to New Buffalo.



Cost and Funding: $25 million to $30 million; source of funding to be determined.

Status: Begin design and engineering.

6.4 POTENTIAL NEW AMTRAK SERVICES

On April 1, 2021, Amtrak announced its aspirational network for 2035, significantly expanding existing services. The proposed new routes and expanded existing services, all not yet funded, reflect the railroad's orientation toward corridor services. Michigan would be a significant beneficiary of the Amtrak 2035 plan.

Figure 52. Proposed Amtrak Network (2035)

6.4.1 Existing Michigan Services Increased Frequencies

The Amtrak 2035 vision includes additional frequencies on Michigan's existing services. At present, the numbers of additional frequencies for the three Michigan services have not been announced.

6.4.2 Detroit-Windsor-Toronto Service

Currently, VIA Rail Canada offers passenger rail service between Windsor and Toronto. The proposed service would likely be an extension of the existing Wolverine service, providing a Chicago-to-Toronto through-service.

To establish the international service, a joint operating agreement between Amtrak and VIA Rail would be required. Similarly, operating agreements may also be required with Canadian Pacific, Conrail, Essex Terminal Railway, and/or Canadian National in Canada. In addition to the railroad operating agreements, coordination with U.S. Customs and Border Protection and the Canada Border Services Agency for establishing operations and supporting facilities will be required..

Each of these future services will require study to determine their feasibility and needed investment. In addition, funding sources need to be identified.

6.4.3 Detroit-Ohio Service

A new service between Detroit, Toledo, and other Ohio locations is also proposed. This route would provide connections to Cleveland, Columbus, and Cincinnati (the three largest cities in Ohio), as well as Amtrak's Lake Shore Limited, its intercity train operating between Chicago and New York City.

6.5 OTHER POTENTIAL NEW PASSENGER RAIL INITIATIVES

6.5.1 New Center Intermodal Facility

The New Center Intermodal Facility is a proposed multimodal transit center in Detroit that is planned to be developed as a public-private partnership. The objectives of the facility are:

- Expand connectivity.
- Establish a regional transportation hub.
- Improve customer experience.
- Enhance public space.
- Leverage land value.

The cost of the facility is estimated to be $36 million to $45 million.

6.5.2 Ann Arbor-Traverse City Service (A2TC)

In 2018, a study was sponsored by the Groundwork Center for Resilient Communities examining the feasibility of reintroducing passenger rail service between Ann Arbor and Traverse City. Investment to upgrade the line to accommodate safe passenger operations at travel times competitive with automobile travel would range between $40 million (five-hour trip at 60 mph) at the low end and nearly $1 billion (three-and-a-half-hour trip at 110 mph), the latter being a complete replacement of the track and ties. A four-and-a-half-hour trip would require an investment of $650 million to permit train speeds of 90 mph. An extension to Detroit was also contemplated at some time in the future. Funding is currently not available.

A more recent cost analysis by MDOT produced an estimated investment of just a little more than $1 billion to support train speeds of 60 mph.

6.5.3 Ann Arbor-Detroit Commuter Rail

Detroit has not had commuter rail service since 1983. For more than a decade, interest groups have promoted commuter rail service between Detroit and Ann Arbor. Currently, funding does not exist. One future possibility is to become an extension of any Toledo-Detroit Amtrak service.

6.5.4 Michigan Central Station

The purchase and renovation of Michigan Central Station by Ford has stimulated consideration of reestablishing passenger rail service at the facility. It could be an ideal location for the Detroit station for a new Toronto service.

6.5.5 Michigan Coast-to-Coast Passenger Rail Study

In 2016, a study of coast-to-coast passenger rail service sponsored by the Michigan Environmental Council found that the service had potential economic benefits. The study examined three potential routes from Detroit via Lansing and Grand Rapids to Holland that could be established by upgrading existing lines. One route would pass through Ann Arbor and Jackson, another through Ann Arbor and Howell, while a third route would bypass Ann Arbor, heading from Wayne to Howell. Two train speed options were examined: 79 mph and 110 mph. Key findings were that both of the proposed routes that would pass through Ann Arbor would be viable options that deserve further study, while the third route did not merit further study since it would bypass the large ridership demand in Ann Arbor. Establishing a 79 mph service on the 187-mile route through Ann Arbor and Howell has been estimated to require an investment of $130 million.

6.5.6 Other Potential Passenger Rail Service Initiatives

The following potential services were suggested in MM2045:

- Holland/Grand Rapids commuter rail options.
- Holland/Grand Rapids/Kalamazoo regional rail service connection to the high-speed Michigan Line in Kalamazoo.
- Additional frequencies on the current Pere Marquette (Grand Rapids/Holland/Chicago) service.

Each of these future services will require study to determine their feasibility and needed investment. In addition, funding sources need to be identified.

6.6 EQUIPMENT

MDOT is a member of the Midwest States Consortium, a group of four Midwest states (Illinois, Michigan, Missouri, and Wisconsin) established to procure the next generation passenger locomotives and cars to supplement and replace existing fleets. The consortium has purchased 33 locomotives and 88 passenger railcars to be pooled among the states for use in Amtrak corridor services. The equipment is being built by Siemens. The locomotives are currently in service on select corridors in the four states, including the three Michigan passenger services. The railcars are state of the art with the following features:

- Increased Americans with Disabilities Act (ADA) enhancements:

  - Integrated wheelchair lifts.
  - Fully ADA-compliant washrooms.
  - Allows for freedom of movement for ADA customers between cars.

- Outlets at seats.
- USB ports at seats.
- Onboard information system.
- Customer Wi-Fi.
- Enhanced food service areas.
- Bicycle racks incorporated into cars.
- Two classes of service.

In January, a four-car set was tested on the Wolverine route. The order is expected to be completed in 2023.

6.7 FRA MIDWEST REGIONAL RAIL PLANNING STUDY

The Midwest Regional Rail Planning Study is one of three regional passenger rail studies that include the Southeast and the Southwest. The goal of the study is to provide a 40-year framework for the Midwest intercity passenger rail network, including the following:

- Prioritizing corridors and investment projects.
- Defining a governance structure.
- Developing a funding strategy.

The purpose of the study is to advance regional rail planning for the Midwest:

- Engage in a long-term visioning process.
- Perform conceptual planning of high-performance passenger rail at the regional level.
- Support National Rail Planning objectives.
- Final Regional Rail Plan supports existing statewide and regional processes:
  - State Rail Plans.
  - Long-Range Transportation Planning.
- Facilitate future planning and streamline implementation.

6.8 MICHIGAN ASSOCIATION OF RAILROAD PASSENGERS IDENTIFIED ISSUES, OPPORTUNITIES, AND IMPROVEMENTS

The MARP, an independent passenger rail advocacy group, provided its aspirations for passenger rail service. These are summarized in the following sections.

6.8.1 Michigan Association of Railroad Passengers Vision

The following issues, opportunities, and improvements identified by MARP reflect its vision for passenger rail service in Michigan:

- The system must comprise intercity trains that are modern, fast, reliable, and operate frequent, regular-interval schedules.
- The trains should connect all significant population centers in Michigan with other population centers in Michigan and centers throughout the United States and Canada.
- The system must be closely integrated with other means of public passenger travel to allow seamless transfer from one mode to the other and to promote travel into Michigan.

To meet its vision, MARP has identified a number of passenger rail improvements in several areas:

- Track and right of way.
- Stations.
- Schedules.
- Equipment.
- New services.

A number of MARP's recommendations are in one stage or another of being implemented. Others need further consideration and study, including availability of funding.

6.8.2 Track and Right of Way

- Separation of passenger trains from freight trains, specifically on a 1.8-mile line segment of Canadian National at Battle Creek (in progress).
- Fencing and signs in certain areas to prevent crossing between station tracks and reduce trespassing near stations, in yards, and on the rights of way where trespassing frequently occurs.
- Reduction of congestion between the Porter, Indiana, and Chicago.
- A track connection northeast of New Buffalo to allow Grand Rapids trains access to the high-speed corridor and to serve New Buffalo.

- Reduction of interference between Canadian National and Conrail operations between Dearborn and Pontiac as it affects passenger rail service.
- Closure, separation, or improved protection of selected highway-rail grade crossings by installing four quadrant gates, skirting/center-line barriers, pedestrian barriers, or advanced warning devices.

6.8.3 Stations

- Additional passenger station structural, rebuilds, or replacements consistent with the preservation and adaptive reuse of historic depot buildings.
- Additional station facility enhancements: suitable waiting rooms, restrooms, platforms, parking, lighting, multilingual signs, handicapped accessibility, emerging mobility access, and micro-mobility solutions.
- Additional station multimodal connections.
- Level boarding facilities where feasible, consistent with FRA and ADA standards, at the busiest stations to enhance the comfort and safety of all passengers as well as help keep trains on time.

6.8.4 Schedules

- Efforts to ensure on-time arrivals and departures.
- Train schedules on the Chicago-to-Detroit/Pontiac corridor with hourly departures during peak travel hours and once every two hours during off-peak travel times.
- Increased train frequency in the Chicago-Detroit/Pontiac corridor to at least five or six roundtrips followed by the two other existing routes in the state.
- At least one mid-morning or late morning train arrival in Detroit from the west and one late evening or early night train departure from Detroit.
- Train schedules that facilitate connections with other trains, intercity buses, and local transit for maximum passenger convenience.

6.8.5 Passenger Rail Equipment

- Modern, well-maintained coaches with two classes of service and improved onboard meals.
- Safe and reliable diesel locomotives that meet or exceed evolving emissions standards.
- Evaluation of the use alternative energy locomotives and multiple unit power.

- International through-train service between southeast Michigan and Windsor, and between Port Huron and Sarnia.

- New Amtrak Thruway Motorcoach bus services between Ann Arbor, Dearborn, Detroit, and Windsor to provide corridor train connections between Amtrak and VIA Rail trains terminating in Detroit and Windsor.
- New service between Chicago and Grand Rapids on a route that operates on the corridor via Kalamazoo.
- Add service to the Blue Water route. Terminate at least one new train on this route in Bay City instead of Port Huron.
- New service connecting Detroit, Ann Arbor, Lansing, and Grand Rapids/Holland/ Muskegon. Extend this route to Toledo to provide vitally important connections to the rest of the Amtrak system.
- Commuter rail service in southeast Michigan: (1) service in the Detroit area, (2) service to Detroit Metro Airport, and (3) service on the Ann Arbor-Howell-Brighton route. In the Detroit area, trains may serve both the existing Amtrak Station and the restored former Michigan Central Station.

7. Rail Service and Investment Program Introductory Matters

This plan describes and incorporates the elements of an FRA-prescribed Rail Service and Investment Program (RSIP) chapter of a State Rail Plan. In some cases, the elements are only described since the content is presented elsewhere in MM2045 (presenting it here would be redundant). In other cases, when the elements are not redundant, they are presented in this document as they would be in the RSIP chapter of a Rail Plan.

7.1 VISION, GOALS, AND OBJECTIVES

MM2045 has been established as a multimodal plan. The vision, goals, and objectives of MM2045 are transferrable across modes and are adopted as the vision, goals, and objectives for passenger and freight rail.

7.2 PROGRAM COORDINATION

Traditionally, states prepare a "family of plans," including modal plans. MM2045 incorporates all modal plans. As such, the rail component was coordinated with the other modal components of MM2045. The plan has also been coordinated with multistate efforts, such as the Amtrak Vision 2045. The plan considers rail activities in neighboring states. For passenger rail, this includes activities relevant to the Chicago-to-Detroit/Pontiac rail corridor. For freight rail, recent and proposed railroad mergers, new port connections, and other developments will affect Michigan's role in the North American freight network.

7.3 RAIL AGENCIES

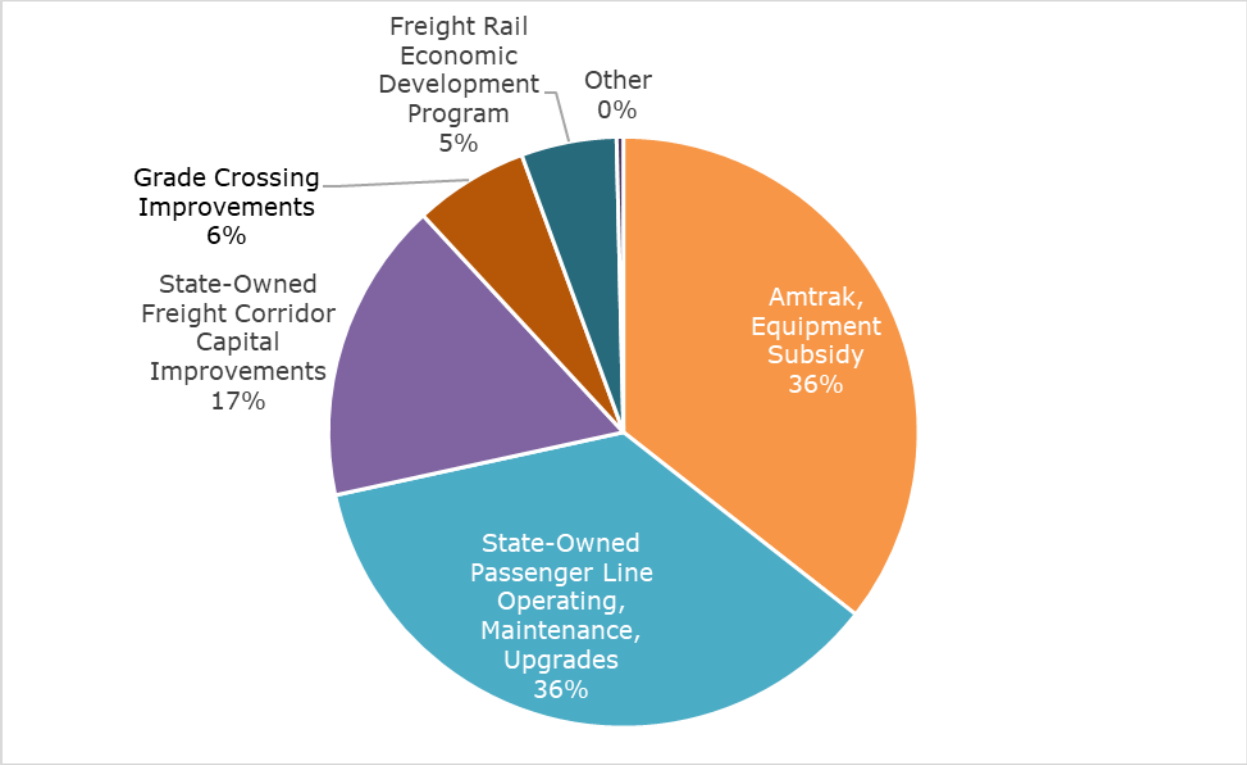
The MDOT Office of Rail does not anticipate major organizational changes.

7.4 RAIL OPERATING AND CAPITAL – FIVE-YEAR PLAN

The MDOT Office of Rail has produced a five-year strategic plan, covering state FY 2021-2025. The strategic plan, in addition to Michigan's highway-rail grade crossing program, anticipates $382 million in state funding for programs or projects through the Office of Rail for the five-year period, or $76.5 million per year. As shown in Figure 53, nearly three-quarters (72 percent) would be spent on Michigan's passenger rail services either through subsidies for Amtrak services (the portion of expenses not covered by passenger revenues) or through maintenance or improvements to the passenger rail line that Amtrak trains use between Kalamazoo and Dearborn. This includes subsidies paid to Amtrak to operate Michigan intercity passenger rail services, payments for passenger rail equipment to the

Midwest states equipment pool (Amtrak subsidies and equipment are 36 percent), and for investments and expenses associated with the 135-mile MDOT-owned passenger corridor between Dearborn and Kalamazoo (36 percent).

Figure 53. MDOT Office of Rail Program Five-Year Strategic Plan

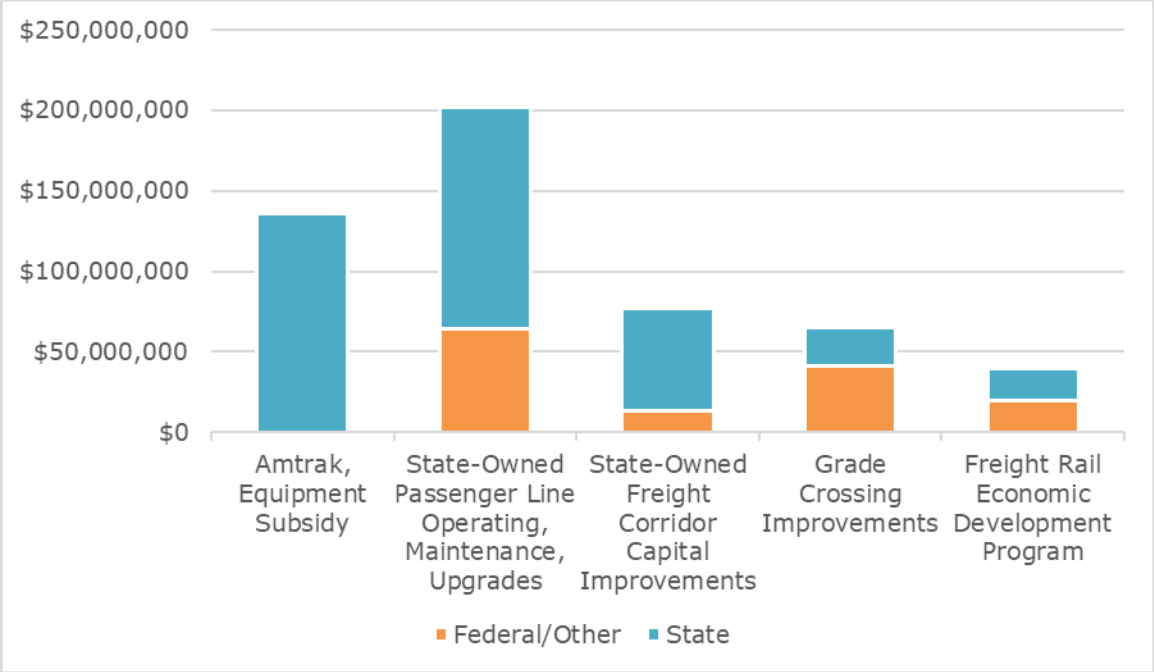


Source: MDOT

Another 17 percent would be spent on capital improvements to the 530 miles of freight-only rail lines. Six percent would be directed to resurfacing and safety improvements to crossings, while 5 percent would be spent on Michigan's ongoing Freight Rail Economic Development Program, which helps Michigan businesses to access the freight rail network.

MDOT's share of total expenditure varies depending on the type of expenditure. As shown in Figure 54, MDOT pays the net costs (costs in excess of passenger revenues) of all the subsidies needed to operate its state-supported intercity passenger rail services, including payments to Amtrak for equipment, insurance, and operating maintenance on the state-owned passenger rail segment. MDOT pays a significant portion of the cost of capital improvements on state-owned rail lines. The federal government has also provided support for capital projects. Most (63 percent) of the cost of crossing improvements is from MDOT's allotment of federal Railway-Highway Crossing (Section 130) funds.

Figure 54. MDOT Office of Rail Program Five-Year Plan – Sources of Funding



Source: MDOT

A listing of projects from the five-year strategic plan can be found in the body of the MM2045 plan.

7.5 RAILROAD OPERATING AND CAPITAL – YEARS 6 TO 20

7.5.1 Passenger Rail Subsidies and Equipment Costs

Between 2021 and 2025, MDOT expects to spend $27 million per year operating intercity passenger services:

- $24 million in Amtrak operating assistance.
- $3 million in Midwest States Equipment.

If MDOT were to operate the same daily five round-trip passenger trains over the next 25 years as during the next five, a best guess estimate would be that the costs above would continue in years 6 to 25. However, MDOT recently completed a Service Development Plan that anticipates a doubling or tripling of the number of trains for the Wolverine service by 2035.[12] The impact on passenger rail subsidies of adding these frequencies is unsure since the level of subsidies depends not only on the incremental cost of providing the additional services but also the revenues earned from the incremental ridership. The Service Development Plan anticipates that additional capital investments would yield improvements

[12] GreatLakesRail.org, *Chicago – Detroit/Pontiac Passenger Rail Corridor Program Service Development Program*, Aug. 3, 2017.

in the speed and level of service along the corridor. The added frequencies would also boost the desirability of the service due to the added convenience. This, in turn, could attract additional ridership and potentially increase revenues faster than incremental costs so that the subsidies would actually decrease as passenger revenues cover a higher share of costs. However, if MDOT were to take on a new passenger rail service on a corridor with little passenger density, costs could significantly increase. Given the related uncertainties, MM2045 assumes that $27 million per year will be available to cover Amtrak operating subsidies and equipment regardless of the specific intercity passenger rail services provided, consistent with that predicted in the five-year strategic plan.

7.5.2 State-Owned Rail Line Operating and Capital Maintenance Costs

7.5.2.1 Passenger Line Operating

The MDOT Five-Year Strategic Plan assumes that the state-owned passenger rail corridor between Dearborn and Kalamazoo would cost $11.7 million per year to maintain and manage:

- $11 million Kalamazoo – Dearborn operating maintenance.
- $1.7 Kalamazoo – Dearborn utilities and insurance.

Over a 25-year period, this would total $285 million.

7.5.2.2 Passenger and Freight Line Bridge Maintenance and Improvement

A planning level analysis of MDOT bridges estimates that, based on current conditions and likely deterioration rates, MDOT bridges will probably require about $219 million in investment over the next 25 years, including $77.5 million for bridges on freight lines and $141.7 in investment on bridges on the state-owned passenger line segment.

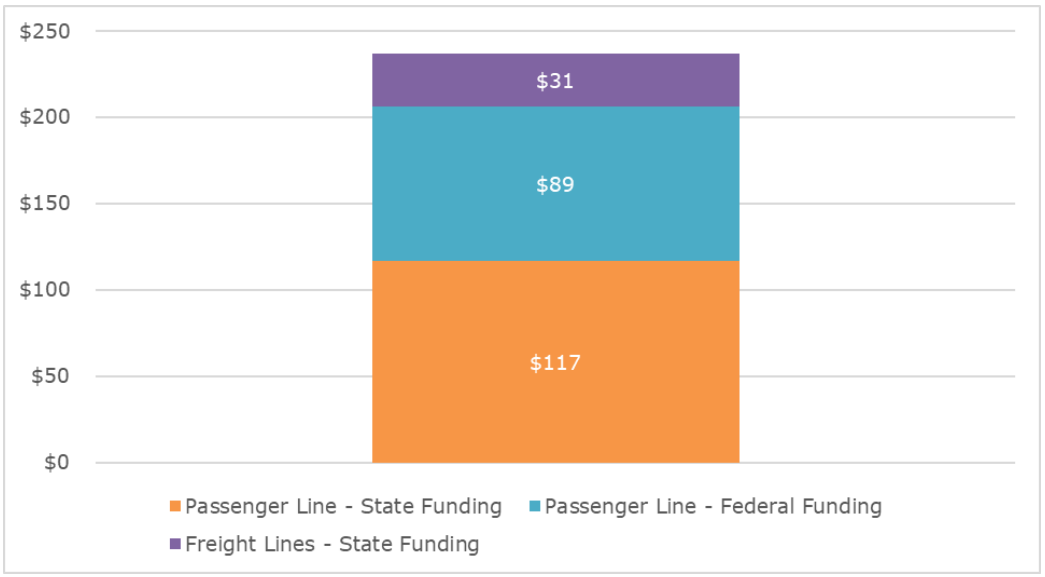
Figure 55. Bridge Maintenance/Improvement Costs over 25 Years on State-Owned Rail Lines (Millions)

Source: WSP, MDOT

7.5.2.3 Passenger and Freight Line Track, Signal Crossing Capital Maintenance

The MDOT Five-Year Strategic Plan included $47 million for other capital maintenance (track, signals, and crossings). This includes $6 million for maintaining freight lines and $41 million for maintaining the state-owned passenger rail segment. Capital maintenance on the state-owned passenger segment is expected to be supported in part by federal grants, which are forecast to be $18 million, leaving the state share at $23 million. If these levels were to continue into the future, the total cost for track, signal, and crossing capital maintenance on state-owned rail lines would be $237 million over a 25-year period (Figure 56), with $117 million in state funding for the state-owned passenger rail segment and $31 million in state funding for state-owned freight lines. Prior federal funding came from competitive, discretionary grant programs. No guarantee exists that federal funding for rail projects will be available, nor that MDOT will continue to win multimodal federal grants. If federal funding is not available in the future, the additional costs will need to be funded by the state.

Figure 56. Track, Signal, Crossing Capital Maintenance, over 25 years on State-Owned Rail Lines (Millions)



Source: WSP, MDOT

7.5.2.4 Other Investments

The MDOT Five-Year Strategic Plan forecasts that the state will provide various matching funds to grants that would improve the passenger line between Dearborn and Kalamazoo. Some examples include:

- Trespasser prevention.
- Battle Creek freight/passenger separation design and environmental work.
- Curve modifications between Jackson and Ypsilanti.

State matching for these improvements is expected to total $26 million between FY 2021 and 2025. If the state were to provide similar investments on its passenger and freight lines over the 25 years of MM2045, the total would be $151 million.

7.5.3 Grade Crossing Improvement Program

MDOT administers the federal Section 130 grade crossing program with an allotment of $8.2 million per year. Michigan also contributes $6 million per year in state funds for grade crossing safety improvements and resurfacing projects. However, the $6 million in nominal dollars is expected to remain in place during the duration of MM2045. With expected inflation, this is only $4.8 million in 2020 dollars during the project period. For the 25 years covered by MM2045, the total estimate for grade crossing improvements, including federal and state funding, is $326 million. The MDOT share is $120 million.

7.5.4 Freight Economic Development Program

MDOT seeks to make funding available to all viable applications for the MDOT Freight Economic Development Program. Based on recent years, this has usually been $4 million per year. Because MDOT requires at least 50 percent matching, projects supported by the program are expected to total at least $8 million per year. For the purposes of MM2045, the total value of Freight Economic Development Program projects is projected to be $200 million, with $100 million in state funding.

7.5.5 Proposed Michigan Rail Network Improvements

Accomplishing significant improvements to Michigan's rail network will require major non-state investment. MDOT has been successful at securing federal funding for projects in the state in the past, although this is no guarantee of future success. A master list of proposed projects is found in the MM2045 plan.

7.5.5.1 Proposed Passenger Rail Improvements

As discussed in the passenger rail needs chapter, projects have been recommended by Amtrak, the Michigan Association of Railroad Passengers, and others. Several are incorporated into the Michigan five-year strategic plan, including curve improvements between Jackson and Ypsilanti and engineering for a new Battle Creek connector.

Table 23 shows other proposed passenger rail improvements. Of the projects listed in Table 23, the Battle Creek Connector and the Niles-Glenwood Road double tracking are further along in planning/environmental/design process. Note that the costs listed in Table 23 include only the capital costs of these initiatives. Each project could have implications for ongoing impacts on operations and maintenance expenditures, particularly projects that would expand service.

Table 23. Proposed Passenger Rail Projects

Category	Project	Cost
Infrastructure Projects to Improve Existing Services on Existing Routes	Battle Creek Connector Bypassing Canadian National	$39,000,000
	CSX/Michigan Line Connector east of New Buffalo	$27,500,000
	Jackson Station Reconfiguration	$33,300,000
	Detroit New Center Station	$50,000,000
	Niles-Glenwood Road Double Tracking	$100,500,000
	Ann Arbor Multimodal Station	TBD
	TOTAL	**$250,300,000**
Service Expansion - Amtrak Proposed	Cleveland - Detroit Service	$300,000,000
	Michigan Central Station	TBD
	Reroute Lake Shore Limited to Michigan Line	TBD
	Service to Ontario	TBD
Service Expansion – Michigan Association of Railroad Passengers, Other Proposed	Additional frequencies - all routes	TBD
	Ann Arbor - Detroit Commuter Rail	$329,000,000
	Ann Arbor - Traverse City	$650,000,000
	Chicago – Grand Rapids via Kalamazoo	TBD
	Daily service to Bay City - Blue Water Route	TBD
	Detroit - Ann Arbor - Lansing - Grand Rapids/Holland/Muskegon	TBD
	Holland/Grand Rapids Commuter Rail	TBD

Source: Amtrak, Michigan Association of Railroad Passengers, Other

7.5.5.2 Proposed Short-Line Freight Rail Improvements

As MM2045 was prepared, short-line railroads were asked to identify needs and recommend investments that would address rail needs. The state's short-line railroads responded with 80 projects worth $306 million as summarized in Table 24. Some of these projects could be eligible for MDOT's Freight Economic Development Program, particularly those that would increase rail volumes by establishing or expanding transload facilities. Many of the projects put forward would be eligible for MDOT's Michigan Rail Loan Assistance Program, which provides no-interest loans for projects that preserve or improve freight rail infrastructure in Michigan.

A full list of projects can be found in the MM2045 plan.

Some of these projects could be eligible for MDOT's Freight Economic Development Program, particularly those that would increase rail volumes by establishing or expanding transload facilities. Many of the projects put forward would be eligible for MDOT's Michigan Rail Loan Assistance Program, which provides no-interest loans for projects that preserve or improve freight rail infrastructure in Michigan.

Table 24. Proposed Projects on Michigan Short-Line Railroads

Type of Project	Number of Projects	Cost of Projects
Bridge – Repair, improve or replace bridges	18	$33,889,500
Building – Improve building used for rail service	8	$2,250,000
Crossing – Resurface or other project relevant to highway/rail crossing	3	$475,000
Equipment – Purchase or renovate rail equipment or maintenance-of-way equipment	6	$26,729,000
Siding – Improve or establish rail siding	6	$18,360,000
Signal – Improve or upgrade rail signal system	2	$18,040,000
Track upgrade – Augment the standards of railroad track, replacing rail with better rail, increasing FRA track class, etc.	8	$99,300,000
Track Rehabilitation – Bring track to a state of good repair	11	$31,325,600
Track Relocation – Move tracks to a different location	3	$37,100,000
Transload – Improve or establish truck/rail transload facility, improve or establish rail/marine facility	9	$11,398,000
Yard – Make improvements to a rail yard	6	$27,351,466
TOTAL	**80**	**$306,218,566**

Source: Survey of short-line railroads

7.5.5.3 Proposed Class I Freight Rail Improvements

Class I improvements include several projects proposed by Norfolk Southern for MM2045, projects developed as the part of the DIFT initiative, and the Canadian Pacific Tunnel. DIFT aims to improve the efficiency of freight rail flows in the Detroit area, as well as provide more efficient, higher capacity freight rail, truck access capabilities at the Livernois Junction intermodal terminal (Table 25). For some projects, MDOT has reached agreement with the affected railroads, and these projects can proceed as conceived in the DIFT program. Other projects are contingent on agreements with the affected freight railroads. MDOT assumes that DIFT projects would be funded half-public/half-private, and the public share could include federal participation. The highest cost project on a Class I railroad is the Detroit River Tunnel, which would build a new rail tunnel between Detroit and Windsor. This would enable unrestricted double-stack containers. Although the Detroit Tunnel did not feature prominently in the preparation of MM2045, it was thought to still be appropriate to include in MM2045, given the 25-year time horizon of a rail plan.

Table 25. Proposed Freight Rail Projects on Class I Railroads

Category	Project	Cost
Projects Recommended by Class I Railroads for MM2045	Pave Norfolk Southern Livernois Junction Yard	$13,800,000
	DRIC Connection (Conrail, Norfolk Southern)	$3,000,000
	Norfolk Southern Domestic Service	$50,000,000
	TOTAL – CLASS I RECOMMENDED PROJECTS	**$66,800,000**
Projects from the DIFT "First Five-Year Plan"	Canadian Pacific YD Interlocker (Canadian National, Conrail)	$4,100,000
	Design Civil Work Outside Terminal	$8,000,000
	TOTAL – DIFT "FIRST FIVE-YEAR PLAN"	**$12,100,000**
DIFT "Projects to be Completed as Determined by DIFT Railroads" and Canadian Pacific Tunnel	Vinewood Interlocker (Canadian National, Conrail)	$2,300,000
	Oakwood Junction Interlocker (Norfolk Southern, Canadian National)	$5,300,000
	Schaefer Interlocker (Canadian National, Conrail)	$5,300,000
	Track from Oakwood to Schaefer (Canadian National)	$16,500,000
	New Rotunda Interlocker (Conrail)	$6,200,000
	Milwaukee Junction Interlocker	$17,500,000
	Beaubien Interlocker (Canadian National, Conrail, Amtrak)	$4,300,000
	Civil Work Outside Terminal	$82,400,000
	Civil Work Inside Terminal	$38,900,000
	Canadian Pacific Terminal	$64,100,000
	Mill Interlocker (Canadian National, Conrail)	$2,900,000
	Trenton Interlocker (Canadian National, Conrail)	$89,200,000
	CSX Terminal	$57,200,000
	Canadian Pacific Tunnel	$446,200,000
	TOTAL	**$838,300,000**

Source: MDOT, 2011 Rail Plan

7.5.5.4 Overall Freight and Passenger Rail Program

If MDOT's strategic plan were to remain over the next 25 years consistent with the strategic plan prediction of FY 2021-2025, total costs and MDOT funding would be as shown in Table 26.

Table 26. Funding Available for MDOT Office of Rail Programs over 25 Years, Assuming Levels Consistent with Five-Year Strategic Plan

Item	Amount
Amtrak, Equipment Subsidy	$680,000,000
State-Owned Passenger Line Operating, Capital Maintenance, Upgrades	$688,000,000
State-Owned Freight Line Capital Improvements	$316,000,000
Grade Crossing Improvements	$120,000,000
Freight Rail Economic Development Program	$100,000,000
Other	$7,000,000
TOTAL	**$1,911,000,000**

Source: WSP, MDOTMDOT

Stakeholders consulted for MM2045 recommended $2.8 billion worth of potential upgrade projects, and these only include the projects with cost estimates. Other projects put forward without cost estimates are not included in the $2.8 billion. Furthermore, some of the

passenger rail proposals would require additional operating and maintenance expenditures that are also not included. These proposed improvements are listed in Table 27.

Table 27. Summary of Stakeholder Proposed Rail Improvements for MM2045

Item	Total
Passenger Rail Improvements	$1,529,300,000
Short-Line Railroad Projects	$306,000,000
Class I Railroad Recommended Projects	$66,800,000
Projects from DIFT First Five-Year Plan	$12,100,000
Longer-Term DIFT Projects	$392,100,000
Canadian Pacific Tunnel	$446,000,000
TOTAL UPGRADES	**$2,752,000,000**

Source: WSP, MDOT

Projects listed in Table 27 will require more funds than MDOT has previously been provided. Furthermore, much of MDOTs rail funding is committed to existing passenger services or maintenance/improvements to state-owned rail lines. While MDOT has been successful in obtaining federal funding, to meaningfully address the needs listed in Table 27 will require funding resources beyond what MDOT has been able to supply or secure in the past.

7.6 PROGRAM EFFECTS

The Freight and Passenger Rail Program presented in this chapter will support the goals of MM2045. The following impacts are described for each MM2045 goal:

1. **Safety and Security:** Enhance the safety and ensure the security of the transportation network for all users and workers.

   Because trains travel on their own rights of way, rail is a relatively safe mode of transportation. Statistically, the rate of accidents, injuries, and fatalities per ton-mile of goods, or per passenger-mile of people transported is less for rail than for highway travel. The program of projects presented herein will help to increase or maintain usage of rail and will thereby keep cars and trucks off the highway and onto rail where travel is safer.

   The program also includes projects specifically aimed at improving the safety of the rail network, including highway-rail grade crossing improvements and measures to prevent trespassers from being struck by trains on rail rights of way. Projects also reduce the risk of train accidents by maintaining tracks/bridges at a condition that will make derailments less likely.

2. **Network Condition:** Through investment strategies and innovation, preserve and improve the condition of Michigan's transportation network so that all modes are reliable, resilient, and adaptable.

   Much of this program consists of capital and operating maintenance programs and projects that will help to maintain or bring Michigan's rail network to a state of good repair.

3. **Mobility:** Enhance mobility choices for all users of the transportation network through efficient and effective operations and reliable multimodal opportunities.

   The program includes expenditures that will maintain rail as a viable option for shipping goods and for intercity passenger travel. Among the projects are improvements that promote multimodal connections such as improvements to passenger train stations, intermodal container terminals, and transload facilities. Projects will alleviate bottlenecks and delays, such as projects that separate freight and passenger rail or that improve the flow of trains in the Detroit area.

4. **Quality of Life:** Enhance quality of life for all communities and users of the transportation network.

   The program of projects will support communities by providing them with transportation alternatives. The program improves the travel experience of rail passengers and allows the continued use or renovation of historically significant railroad stations.

5. **Economy and Stewardship:** Improve the movement of people and goods to attract and sustain diverse economic opportunities while investing resources responsibly.

   The program promotes Michigan's competitiveness through improved freight rail connections that support Michigan industries, including sectors that are vital to rural areas within the state. Projects oriented toward passenger rail help to connect Michigan communities to regional and national economies and make these communities more attractive locations for people and businesses to locate.

6. **Partnership:** Strengthen, expand and promote collaboration with all users through effective public and private partnerships that reflects Michigan's diversity, equity, and inclusion principles.

   Freight rail projects with public-sector participation are by definition partnerships between the public and private sectors because private companies provide freight services. Passenger rail projects require partnerships with railroads (both Amtrak and freight) with local communities, and with regional/national organizations.

Appendix A. Michigan Passenger Rail Station Profiles

Table A-1. Michigan Passenger Rail Station Profiles

Feature	Albion	Ann Arbor	Bangor
Address	300 North Eaton St. Albion, MI 49224	325 Depot St. Ann Arbor, MI 48104	541 Railroad St. Bangor, MI 49013
Train Service	Wolverine	Wolverine	Pere Marquette
Service Frequency	Wolverine: twice daily	Wolverine: six times per day	Pere Marquette: twice daily
Station Location	Rural (small town)	Suburban	Rural (small town)
Shelter	Historic station building (with waiting room)	Station building (with waiting room)	Historic station building (with waiting room)
ADA	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available
Baggage Service	No checked baggage service; no bag storage; no baggage assistance	No checked baggage service; bag storage available (with fee); baggage assistance by station staff	No checked baggage service; no bag storage; no baggage assistance
Restrooms	Accessible restrooms	Accessible restrooms	Accessible restrooms
Ticketing	No ticket office; no Quik-Trak kiosks	Ticket office; Quik-Trak kiosks	No ticket office; no Quik-Trak kiosks
Shared Uses	Intercity bus	Intercity bus	Café and office space
Parking	Same-day and overnight, accessible	Same-day and overnight, accessible	Same-day and overnight, accessible
Transit Connections	N/A	Ann Arbor Transportation Authority	Van Buren Public Transit (Dial-A-Ride Transit)
Intercity Bus Connections	Greyhound	Greyhound; Indian Trails; Baron Bus Line; Amtrak Thruway Motorcoach	N/A
Active Transportation Access	No bike rack/locker; handicap terminal/rail	No bike rack/locker; handicap terminal/rail	No bike rack/locker; handicap terminal/rail

Sources: MDOT, Amtrak, Great American Stations website, downloaded in August 2020

Table A-1. Michigan Passenger Rail Station Profiles (continued)

Feature	Battle Creek	Dearborn	Detroit
Address	119 McCamly St. South Battle Creek, MI 49017	John D. Dingell Transit Center 21201 Michigan Ave. Dearborn, MI 48124	11 West Baltimore Ave. Detroit, MI 48202
Train Service	Blue Water Wolverine	Wolverine	Wolverine
Service Frequency	Blue Water: twice daily Wolverine: six times per day	Wolverine: six times per day	Wolverine: six times per day
Station Location	Suburban	Suburban	Urban
Shelter	Modernized station building (with waiting room)	Modern multimodal transit center (with waiting room)	Station building (with waiting room)
ADA	Facilities fully wheelchair-accessible; wheelchair available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair available; wheelchair lift available
Baggage Service	No checked baggage service; bag storage available (with fee); baggage assistance by station staff	No checked baggage service; bag storage available (with fee); baggage assistance by station staff	No checked baggage service; bag storage available (with fee); baggage assistance by station staff
Restrooms	Accessible restrooms	Accessible restrooms	Accessible restrooms
Ticketing	Ticket office; Quik-Trak kiosks	Ticket office; Quik-Trak kiosks	Ticket office; Quik-Trak kiosks
Shared Uses	Intercity bus	Local bus and intercity bus	Intercity bus
Parking	Same-day and overnight, accessible	Same-day and overnight, accessible	Same-day and overnight, accessible
Transit Connections	Battle Creek Transit	Suburban Mobility Authority for Regional Transportation (SMART)	QLine; Detroit Department of Transportation (DDOT)
Intercity Bus Connections	Indian Trails; Greyhound; Miller; Amtrak Thruway Motorcoach	Amtrak Thruway Motorcoach; Greyhound	Greyhound, Amtrak Thruway Motorcoach
Active Transportation Access	Bike rack (not enclosed)/locker; handicap terminal/bus/rail	Bike rack (not enclosed)/locker; handicap terminal/rail	No bike rack/locker; handicap terminal/rail

Sources: MDOT, Amtrak, Great American Stations website, downloaded in August 2020
Note: Grand Trunk Corp. is a wholly owned subsidiary of Canadian National.

Table A-1. Michigan Passenger Rail Station Profiles (continued)

Feature	Dowagiac	Durand	East Lansing
Address	200 Depot Drive Dowagiac, MI 49047	200 South Railroad St. Durand, MI 48429-1713	Capital Area Multimodal Gateway 1240 South Harrison Road East Lansing, MI 48823-5223
Train Service	Blue Water Wolverine	Blue Water	Blue Water
Service Frequency	Blue Water: twice daily Wolverine: twice daily	Blue Water: twice daily	Blue Water: twice daily
Station Location	Rural (small town)	Rural (small town)	Suburban
Shelter	Historic station building (with waiting room)	Historic station building (with waiting room)	Modern multimodal transit center (with waiting room)
ADA	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair available; wheelchair lift available
Baggage Service	No checked baggage service; no bag storage; no baggage assistance	No checked baggage service; no bag storage; no baggage assistance	No checked baggage service; no bag storage; no baggage assistance
Restrooms	Accessible restrooms	Accessible restrooms	Accessible restrooms
Ticketing	No ticket office; No Quik-Trak kiosks	No ticket office; Quik-Trak kiosks	No ticket office; Quik-Trak kiosks
Shared Uses	Chamber of commerce and retail	Museum	Local bus and intercity bus
Parking	Same-day and overnight, accessible	Same-day and overnight, accessible	Same-day and overnight, accessible (fee)
Transit Connections	Dowagiac Dial-A-Ride Transit	Shiawassee County Transit Authority	Capital Area Transportation Authority
Intercity Bus Connections	N/A	N/A	Indian Trails; Greyhound; Amtrak Thruway Motorcoach
Active Transportation Access	No bike rack/locker; handicap terminal/rail	No bike rack/locker; handicap terminal	Bike rack (not enclosed); handicap terminal/rail

Sources: MDOT, Amtrak, Great American Stations website, downloaded in August 2020

Table A-1. Michigan Passenger Rail Station Profiles (continued)

Feature	Flint	Grand Rapids	Holland
Address	1407 South Dort Highway Flint, MI 48503-2878	440 Century Ave. SW Grand Rapids, MI 49503	171 Lincoln Ave. Holland, MI 49423
Train Service	Blue Water	Pere Marquette	Pere Marquette
Service Frequency	Blue Water: twice daily	Pere Marquette: twice daily	Pere Marquette: twice daily
Station Location	Suburban	Urban	Suburban
Shelter	Station building (with waiting room)	Modern station building (with waiting room)	Multimodal transit center (with waiting room)
ADA	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available
Baggage Service	No checked baggage service; no bag storage; baggage assistance available	No checked baggage service; no bag storage; no baggage assistance	No checked baggage service; no bag storage; no baggage assistance
Restrooms	Accessible restrooms	Accessible restrooms	Accessible restrooms
Ticketing	No ticket office; No Quik-Trak kiosks	No ticket office; Quik-Trak kiosks	No ticket office; Quik-Trak kiosks
Shared Uses	Local bus and intercity bus	Local bus and intercity bus (in adjacent building)	Local bus and intercity bus
Parking	Same-day and overnight, accessible	Same-day and overnight, accessible	Same-day and overnight, accessible
Transit Connections	Flint Mass Transportation Authority (MTA)	The Rapid	Macatawa Area Express (MAX)
Intercity Bus Connections	Indian Trails; Amtrak Thruway Motorcoach	Indian Trails; Greyhound; Amtrak Thruway Motorcoach	Indian Trails
Active Transportation Access	No bike rack/locker; handicap terminal/rail	No bike rack/locker; handicap terminal	Bike rack (not enclosed); Handicap terminal/rail

Sources: MDOT, Amtrak, Great American Stations website, downloaded in August 2020

Table A-1. Michigan Passenger Rail Station Profiles (continued)

Feature	Jackson	Kalamazoo	Lapeer
Address	501 East Michigan Ave. Jackson, MI 49201	459 North Burdick St. Kalamazoo, MI 49007-3669	73 Howard St. Lapeer, MI 48446-2515
Train Service	Wolverine	Blue Water Wolverine	Blue Water
Service Frequency	Wolverine: six times daily	Blue Water: twice daily Wolverine: six times daily	Blue Water: twice daily
Station Location	Suburban	Urban	Rural (small town)
Shelter	Historic station building (with waiting room)	Historic station building (with waiting room)	Historic station building (with waiting room)
ADA	Facilities fully wheelchair-accessible; wheelchair available; wheelchair lift available	Facilities not fully wheelchair-accessible; no wheelchair available; platform accessible; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available
Baggage Service	No checked baggage service; bag storage available (with fee); baggage assistance by station staff (before 2:30 p.m.)	No checked baggage service; bag storage available (with fee); baggage assistance by station staff	No checked baggage service; no bag storage; no baggage assistance
Restrooms	Accessible restrooms	Restrooms, not accessible	Accessible restrooms
Ticketing	No ticket office; No Quik-Trak kiosks	No ticket office; Quik-Trak kiosks	No ticket office; No Quik-Trak kiosks
Shared Uses	None	Local bus and intercity bus (at adjacent Kalamazoo Transit Center)	Community center
Parking	Same-day and overnight, accessible	Same-day and overnight, accessible (fee)	Same day only, accessible
Transit Connections	Jackson Area Transportation Authority	Metro Transit	Greater Lapeer Transit Authority
Intercity Bus Connections	Amtrak Thruway Motorcoach	Indian Trails; Greyhound; Amtrak Thruway Motorcoach	N/A
Active Transportation Access	No bike rack/locker; handicap terminal/rail	Bike rack (not enclosed)/locker; handicap terminal/bus/rail	No bike rack/locker; handicap terminal/rail

Sources: MDOT, Amtrak, Great American Stations website, downloaded in August 2020

Table A-1. Michigan Passenger Rail Station Profiles (continued)

Feature	New Buffalo	Niles	Pontiac
Address	226 North Whittaker St. New Buffalo, MI 49117-1161	598 Dey St. Niles, MI 49120-1745	Transportation Center 51000 Woodward Ave. Pontiac, MI 48342-2276
Train Service	Blue Water Wolverine	Blue Water Wolverine	Wolverine
Service Frequency	Blue Water: twice daily Wolverine: five times daily	Blue Water: twice daily Wolverine: five times daily	Wolverine: six times daily
Station Location	Rural (small town)	Rural (small town)	Suburban
Shelter	Platform with open-sided roofed shelter	Historic station building (with waiting room)	Modern station building (with waiting room)
ADA	Accessible platform; no wheelchair; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair available; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available
Baggage Service	No checked baggage service; no bag storage; no baggage assistance	No checked baggage service; no bag storage; no baggage assistance	No checked baggage service; no bag storage; no baggage assistance
Restrooms	None	Accessible restrooms	Accessible restrooms
Ticketing	No ticket office; No Quik-Trak kiosks	No ticket office; No Quik-Trak kiosks	No ticket office; No Quik-Trak kiosks
Shared Uses	None	Seasonal community events	Intercity bus
Parking	Same-day and overnight, accessible	Same-day and overnight, accessible	Same-day and overnight, accessible
Transit Connections	Berrien Bus (Dial-A-Ride Transit)	Niles Dial-A-Ride Transit	Suburban Mobility Authority for Regional Transportation (SMART)
Intercity Bus Connections	N/A	N/A	Indian Trails
Active Transportation Access	Bike rack (not enclosed); handicap terminal/rail	No bike rack/locker; handicap terminal/rail	No bike rack/locker; handicap terminal/rail

Sources: MDOT, Amtrak, Great American Stations website, downloaded in August 2020 Notes: Ongoing maintenance done by City of New Buffalo; private party owns and maintains station parking

Table A-1. Michigan Passenger Rail Station Profiles (continued)

Feature	Port Huron	Royal Oak	St. Joseph-Benton Harbor
Address	2223 16th St. Port Huron, MI 48060	202 South Sherman Drive Royal Oak, MI 48069	410 1/2 Vine St. St. Joseph, MI 49085
Train Service	Blue Water	Wolverine	Pere Marquette
Service Frequency	Blue Water: twice daily	Wolverine: six times daily	Pere Marquette: twice daily
Station Location	Suburban	Suburban	Rural (small town)
Shelter	Modular station building (with waiting room)	Platform with partially enclosed roofed shelters*	Historic station building (with waiting room)
ADA	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available	Accessible platform; no wheelchair; wheelchair lift available	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available
Baggage Service	No checked baggage service; no bag storage; no baggage assistance	No checked baggage service; no bag storage; no baggage assistance	No checked baggage service; no bag storage; no baggage assistance
Restrooms	Accessible restrooms	Restrooms, not accessible	No restrooms
Ticketing	No ticket office; Quik-Trak kiosks	No ticket office; Quik-Trak kiosks	No ticket office; Quik-Trak kiosks
Shared Uses	Intercity bus	Local bus (at adjacent Royal Oak Transit Center)	Commercial space
Parking	Same-day and overnight, accessible	Same-day and overnight, accessible	Same-day and overnight, accessible
Transit Connections	Bay Metro Area Transportation Commission	Suburban Mobility Authority for Regional Transportation (SMART)	Twin Cities Area Transportation Authority (TCATA)
Intercity Bus Connections	Miller, Amtrak Thruway Motorcoach	N/A	N/A
Active Transportation Access	No bike rack/locker; handicap terminal/rail	No bike rack/locker; handicap terminal/rail	Bike rack (not enclosed); handicap terminal/rail

Sources: MDOT, Amtrak, Great American Stations website, downloaded in August 2020
Notes: The adjacent Royal Oak Transit Center can provide shelter but it does not formally serve Amtrak customers

Table A-1. Michigan Passenger Rail Station Profiles (continued)

Feature	Troy
Address	Troy Transit Center 1201 Doyle Drive Troy, MI 48084
Train Service	Wolverine
Service Frequency	Wolverine: six times daily
Station Location	Suburban
Shelter	Modern multimodal transit center (with waiting room)
ADA	Facilities fully wheelchair-accessible; wheelchair not available; wheelchair lift available
Baggage Service	No checked baggage service; no bag storage; no baggage assistance
Restrooms	Accessible restrooms
Ticketing	No ticket office; no Quik-Trak kiosks
Shared Uses	Local bus
Parking	Same-day and overnight, accessible
Transit Connections	Suburban Mobility Authority for Regional Transportation (SMART)
Intercity Bus Connections	N/A
Active Transportation Access	Bike rack (not enclosed); handicap terminal/rail

Sources: MDOT, Amtrak, Great American Stations website, downloaded in August 2020

Appendix B. Michigan Freight Railroad Profiles

Figure B-1. Canadian National Railway Subdivisions in Michigan

Source: Canadian National

Table B-1. Canadian National Railway Subdivisions in Michigan

Subdivision	From/To	Miles	Number of Tracks	Max Speed	Signal Type	Height/Weight Restrictions
South Bend	Griffith, IN / Battle Creek, MI	67	Double	P: N/A F: 60	CTC	286,000 lbs.
Flint	Battle Creek, MI / Port Huron, MI	154	Single and double	P: 79 F: 60	CTC	286,000 lbs.
Kalamazoo Spur	Kalamazoo, MI / Pavilion, MI	9	Single	P: N/A F: 25	Manual	286,000 lbs.
Flint OML	Flint, MI / Flint, MI	4	Single	P: N/A F: 10	N/A	286,000 lbs.
Holly	Detroit, MI / Durand, MI	63	Single and double	P: N/A F: 60	CTC	286,000 lbs.
Shore Line	Toledo, OH / Detroit, MI	55	Single and double	P: N/A F: 40	CTC	286,000 lbs.
Mt. Clements	Detroit, MI / Port Huron, MI	51	Single	P: N/A F: 49	CTC and Manual	286,000 lbs.
Pontiac Belt Line	Pontiac, MI / Pontiac, MI	6	Single	P: N/A F: 25	N/A	286,000 lbs.
Dearborn	Flat Rock, MI / Dearborn, MI	13.5	Single and double	P: N/A F: 20	CTC	286,000 lbs.
Flat Rock	Zug Island, MI / Flat Rock, MI / Diann, MI	37	Single	P: N/A F: 55	CTC and Manual	286,000 lbs.
Manistique	Sault Ste. Marie, MI / Menominee, MI	443	Single	P: N/A F: 40	Manual	Soo Yard to Gladstone – 263,000 lbs., Gladstone to Green - 286,000 lbs.
Iron Mountain	Powers, MI / Iron Mountain, MI	24.5	Single	P: N/A F: 25	Manual	286,000 lbs.
Marquette Range	Baraga, MI / Algoma, MI	110	Single	P: N/A F: 40	Manual	286,000 lbs.
Newberry	Munising, MI / Trout Lake, MI	90	Single	P: N/A F: 35	Manual	286,000 lbs.
Pembine	Hermansville, MI / Faithorn, MI	40	Single	P: N/A F: 25	Manual	286,000 lbs.

Source: Canadian National

Figure B-2. CSX Subdivisions in Michigan

Source: CSX

Table B-2. CSX Subdivisions in Michigan

Subdivision	From/To	Miles	Number of Tracks	Max Speed	Signal Type	Height/Weight Restrictions
Grand Rapids	Grandville, MI / New Buffalo Township, MI	112	Single and double	P:79 F: 50	CTC	Six-axle locomotives prohibited in few locations
Fremont	West Olive, MI / Holland, MI	10.7	Single	P: N/A F: 25	Manual	None
Grand Rapids Terminal	Grand Rapids, MI / Grand Rapids, MI Grand Rapids, MI / Grandville, MI	10.8	Single and double	P: 30 F: 30	CTC, Manual	Six-axle locomotives prohibited in few locations
Plymouth	Plymouth, MI / Grand Rapids, MI Plymouth, MI / Westland, MI	130.3	Single and double	P: N/A F: 40	CTC, ABS	Six-axle locomotives prohibited in locations
Detroit	Dearborn, MI / Plymouth, MI	17.4	Double	P: N/A F: 45	CTC	Six-axle locomotives prohibited in locations
Lincoln Secondary	Carleton, MI / Detroit, MI	19.1	Single	P: N/A F: 49	Manual	None
Saginaw	Northville, MI / Plymouth, MI Westland, MI / Carleton, MI	19.8	Single and double	P: N/A F: 40	CTC	None
Toledo Terminal	Carleton, MI / Erie, MI	52.2	Single and double	P: N/A F: 45	CTC, Manual	Six-axle locomotives, high or wide loads, cars with gross weight exceeding 270,000 lbs. prohibited in locations

Source: CSX

Figure B-3. Norfolk Southern Railway Subdivisions in Michigan

Source: Norfolk Southern

Table B-3. Norfolk Southern Railway Subdivisions in Michigan

Subdivision	From/To	Miles	Number of Tracks	Max Speed	Signal Type	Height/Weight Restrictions
Detroit Line	Gibraltar, MI / Toledo, OH	29.3	Double	P: N/A F: 50	CTC	None
West Detroit Branch	Detroit, MI / Detroit, MI	2.5	Double	P: N/A F: 10	Manual	None
Detroit	Dearborn, MI / Butler, IN	76.0	Single and double	P: N/A F: 60	CTC	None
Boat Yard Line	Detroit, MI / Detroit, MI	3.0	Double	P: N/A F: 10	Manual	None

Source: Norfolk Southern

Table B-4. Amtrak- and MDOT-Owned Sections of the Michigan Line

Subdivision	From/To	Miles	Number of Tracks	Max Speed	Signal Type	Height/Weigh t Restrictions
Michigan Line	Indiana Border / Kalamazoo, MI	79	Single	110	CTC	None
Michigan Line	Kalamazoo, MI / Dearborn, MI	135	Single, double east of Willow Run Airport	110	CTC	None

Source: MDOT

Table B-5. Summary of Michigan Intermodal Terminals

City	Serving Railroad	Facilities Name	Origins Served	Destinations Served	Capacity
Detroit	CSX	CSX Livernois Yard	Elizabeth, NJ Newark, NJH Philadelphia, PA Portsmouth, VA	JaxPort, FL Elizabeth, NJ Newark, NJ Philadelphia, PA Portsmouth, VA	188,000 lifts
Detroit	CN	Moterm Intermodal Terminal	Calgary Chicago, IL Edmonton, AB Halifax, NS Jackson Memphis, TN Moncton Montreal, PQ New Orleans, LA Saskatoon, Brampton, ON Winnipeg Vancouver	Calgary, AB Chicago, IL Edmonton, AB Halifax, NS Jackson, MS Memphis, TN Moncton, NB Montreal, PQ New Orleans, LA Saskatoon, SK Brampton, ON Winnipeg, MB Vancouver, BC	Not available
Detroit	CP	Oak Intermodal Terminal	Not Available	Not Available	100,000
Detroit	NS	Detroit Delray Intermodal Terminal		St. Louis, MO	Not Available
Detroit	NS	Detroit Livernois Intermodal Terminal	Chicago, IL Elizabeth, NJ Bayonne, NJ Norfolk, VA Portsmouth, VA	Chicago, IL Elizabeth, NJ Bayonne, NJ Norfolk, VA Portsmouth, VA	Not Available

Source: Survey of rail carriers, rail carrier websites, published data sources

Table B-6. Michigan Automotive Ramps

Location	Serving Railroad	Loading	Unloading
Dearborn, MI	CN	Ford	N/A
Dearborn, MI	CN	Used	N/A
Hamtramck, MI	CR	General Motors	N/A
Detroit, MI	CR	Chrysler	Chrysler
Detroit, MI	CR	Inactive	Inactive
Flat Rock, MI	CN	Ford	N/A
Flint, MI	CSX	Inactive	Inactive
Flint, MI	CN	General Motors	N/A
Lansing, MI	CN	General Motors	N/A
Lansing, MI	CN	Inactive	Inactive
Melvindale, MI	NS	Ford, GM	Chrysler, Ford
Wayne, MI	NS	Ford	Ford
Wayne, MI	CSX	Ford	N/A
New Boston, MI	CSX	Chrysler, Ford, GM	GM
Lake Orion, MI	CN	No Active Rail Loading	N/A
Sterling Heights, MI	CR	Chrysler	N/A
Warren, MI	CR	Chrysler	N/A
Woodhaven, MI	CN	Chrysler, Ford	Ford
Woodhaven, MI	CN	Ford	Ford

Source: Automotive Facility Guide January 2020 Edition, Transportation Technology Center, Inc.

Table B-7. Summary of Michigan Rail-Served Port Facilities

City	Serving Railroad(s)	Facilities Name/# of Facilities	Commodities Handled
Detroit, MI	CSX NS	Detroit Bulk Storage, Inc.	Sand, gravel, asphalt, crushed stone, rail ballast, aggregates
Bay City, MI	LSRC	Port Fisher Terminals	Bulk, break bulk commodities
River Rouge, MI	CSX NS	Michigan Marine Terminal	Oil, gas, coal
Detroit, MI	CSX NS	Motor City Intermodal Distribution	N/A
River Rouge, MI	CSX NS	Nicholson Terminal and Dock Co.	General cargo, steel, vehicle
Detroit, MI	CN CSX NS	Waterfront Petroleum Terminal Co. - Detroit River Terminal Facility	Fuel, dry bulk materials, natural gas and propane
Detroit, MI	CN CSX NS	Waterfront Petroleum Terminal Co. - Rouge River Terminal Facility	Fuel, dry bulk materials, natural gas and propane
Essexville, MI	LS	Consumers Energy Dan E. Karn Power Plant	Coal
Marquette, MI	LSI	Lake Superior and Ishpeming Railroad	Iron ore
Menominee, MI	CN	KK Integrated Logistics, Inc.	N/A
Monroe, MI	CN NS	Port of Monroe	Coal, limestone, synthetic gypsum, liquid asphalt, natural gas pipeline sections, wind blades, wind tower sections
Munising, MI	CN	Neenah Paper Michigan Inc.	Coal

Source: State of Michigan, Port of Detroit, Bloomberg, Nicholson Terminal and Dock Co., Waterfront Petroleum Terminal Co., KK Integrated Logistics, Port of Monroe, City of Munising, Travel Marquette

Table B-8. Michigan Transload Facilities

Serving Railroad	Railroad Company Name	Name	Location	Facility Type	Capacity Rail Spots or Track Feet if Known
ADBF	Adrian and Blissfield Railroad	ADBF - Blissfield	Blissfield	Transload	10 spots
ADBF	Adrian and Blissfield Railroad	ADBF - Adrian	Adrian	Transload	1 spot
CN	Canadian National	CN CARGOFLO-Flat Rock	Flat Rock	Transload	N/A
CN	Canadian National	CN Distribution Center	Detroit	Transload/ Warehouse	N/A
CN	Canadian National	CN CARGOFLO-Detroit	Warren	Transload	100 spots
CN	Canadian National	K and K	Menominee	Transload	N/A
CN	Canadian National	Lansing Transloading Facility	Lansing	Transload	500 spots
CP	Canadian Pacific	TRANSFLO	Detroit	Transload	50 spots
CR	Conrail	TRANSFLO	Detroit	Transload	65 spots
CR	Conrail	U.S. Transloading Services, LLC	Detroit	Transload Warehouse	3 spots (CSX) 32 spots (NS)
CR	Conrail	PVS Transportation Inc.	Detroit	Transload	42 spots
CSX	CSX Transportation	TRANSFLO	Detroit	Transload	50 spots
CSX	CSX Transportation	TRANSFLO	Grand Rapids	Transload	38 spots
CSX	CSX Transportation	Grand Rapids Steel Distribution	Grand Rapids	Warehouse	N/A
CSX	CSX Transportation	Evans Distribution Systems	Romulus	Warehouse	16 spots
CSX	CSX Transportation	Bay Logistics Inc.	Romulus	Warehouse	13 spots
CSX	CSX Transportation	Bay Logistics Inc.	Canton	Warehouse	4 spots
CSX	CSX Transportation	Columbian Distribution Services Inc.	Grand Rapids	Warehouse	5 spots
CSX	CSX Transportation	Lumbermens Inc.	Holland	Warehouse	8 spots
CSX	CSX Transportation	Michigan Natural Storage Co.	Wyoming	Warehouse	10 spots
CSX	CSX Transportation	Michigan Natural Storage Co.	Holland	Warehouse	N/A
CSX	CSX Transportation	Michigan Terminals LLC	Wyoming	Warehouse	60 spots
CSX	CSX Transportation	Red Cap Distribution	Dearborn	Warehouse	11 spots

Serving Railroad	Railroad Company Name	Name	Location	Facility Type	Capacity Rail Spots or Track Feet if Known
CSX	CSX Transportation	Clean Harbors Environ Services	Burton	Transload	300 spots
CSX	CSX Transportation	BWP Transport Inc.	Saint Clair	Transload	31 spots
CSX	CSX Transportation	All Points Transport Corp.	Dearborn	Transload	N/A
CSX	CSX Transportation	Masselink	Grand Rapids	Transload	N/A
CSX NS	CSX Transportation Norfolk Southern	Wayne Industries Inc.	Wayne	Warehouse	50 spots (CSX) 78 spots (NS)
CSX NS	CSX Transportation Norfolk Southern	Evans Distribution Systems	Melvindale	Warehouse	2 spots
CSX NS	CSX Transportation Norfolk Southern	Bay Logistics Inc.	Hamtramck	Warehouse	15 spots (CSX) 6 spots (NS)
ELS	Escanaba and Lake Superior Railroad Co.	Channing Yard	Channing	Transload	30 spots
ELS	Escanaba and Lake Superior Railroad Co.	Randville	Randville	Transload	28 spots
ELS	Escanaba and Lake Superior Railroad Co.	E&LS - Floodwood	Floodwood	Transload	1 spot
GDLK	Grand Elk Railroad	Turner Yard	Grand Rapids	Transload	N/A
GDLK	Grand Elk Railroad	Hughart Yard	Grand Rapids	Transload	N/A
GDLK	Grand Elk Railroad	Kalamazoo CKS	Kalamazoo	Transload	5 spots
GDLK	Grand Elk Railroad	RSI Leasing Inc.	Grand Rapids	Transload	88 spots
GDLK	Grand Elk Railroad	Northern Dry Bulk	Grand Rapids	Transload Warehouse	50 spots
GDLK	Grand Elk Railroad	Bulkmatic Transport Co.	Grand Rapids	Transload	20 spots
GDLK	Grand Elk Railroad	Clark Logic	Three Rivers	Transload	N/A
GLC	Great Lakes Central Railroad	Northern Dry Bulk	Clare	Transload Warehouse	125 spots
GLC	Great Lakes Central Railroad	Great Lakes Central Railroad	Owosso	Transload	30 spots
GLC	Great Lakes Central Railroad	GLC - Cadillac	Cadillac	Transload	N/A
GLC	Great Lakes Central Railroad	Northern Dry Bulk	Clare	Transload	100 spots

Serving Railroad	Railroad Company Name	Name	Location	Facility Type	Capacity Rail Spots or Track Feet if Known
HESR	Huron and Eastern Railway	Sargent Dock and Terminals	Zilwaukee	Warehouse	100 spots
HESR	Huron and Eastern Railway	Sargent Docks and Terminal	Saginaw	Transload	100 spots
HESR	Huron and Eastern Railway	HESR - Durand	Durand	Transload	N/A
HESR	Huron and Eastern Railway	Central Warehouse - Midland	Midland	Transload	N/A
HESR	Huron and Eastern Railway	Central Warehouse - Saginaw	Saginaw	Transload	7 spots
IN	Indiana Northeastern	Leader Logistics Group	Coldwater	Transload Warehouse	12 spots
JAIL	Jackson and Lansing Line	JAIL - NS	Jackson	Transload	N/A
JAIL	Jackson and Lansing Line	JAIL - Holt - Fetatransport	Holt	Transload	N/A
JAIL	Jackson and Lansing Line	JAIL - Mason	Mason	Transload	2 spots
LSRC	Lake State Railway Co.	Saginaw Transload	Saginaw	Transload	N/A
LSRC	Lake State Railway Co.	Gaylord Transload	Gaylord	Transload	12 spots
LSRC	Lake State Railway Co.	Alpena Transload	Alpena	Transload	N/A
LSRC	Lake State Railway Co.	Standish Transload	Standish	Transload	N/A
LSRC	Lake State Railway Co.	Greenbush Transload	Greenbush	Transload	N/A
LSRC	Lake State Railway Co.	Bay City Transload	Bay City	Transload	N/A
MMRR	Mid-Michigan Railroad	Bear Truss	St Louis	Transload	10 spots
MQT	Marquette Rail	Michigan Rail and Storage Inc.	Comstock Park	Warehouse	30 spots
MRI	Mineral Range Railroad / Mineral Range, Inc.	Ishpeming	Ishpeming	Team Track	3 spots
MS	Michigan Shore Railroad	Ceres Solutions Co-op	Fremont	Transload	1 spot
MS	Michigan Shore Railroad	Bay Logistics Inc.	Spring Lake	Warehouse	9 spots
MS	Michigan Shore Railroad	West Michigan Dock and Market Corp.	Muskegon	Warehouse	10 spots
MS	Michigan Shore Railroad	Brink Farms	Muskegon	Transload	N/A
MS	Michigan Shore Railroad	Bay Logistics	Norton Shores	Transload	N/A

Serving Railroad	Railroad Company Name	Name	Location	Facility Type	Capacity Rail Spots or Track Feet if Known
NS	Norfolk Southern	NS Thoroughbred Bulk Transfer Terminal	Ypsilanti	Transload	196 spots
NS	Norfolk Southern	Miller Truck and Storage Co.	Jackson	Warehouse	30 spots
NS	Norfolk Southern	Lewis C. Howard Inc.	Kalamazoo	Warehouse	25 spots
NS	Norfolk Southern	Freezer and Dry Storage	Taylor	Warehouse	8 spots
NS	Norfolk Southern	Dearborn Steel Center	Dearborn	Transload	50 spots
NS	Norfolk Southern	Capacity Warehouse Distribution Center	Melvindale	Transload Warehouse	12 spots
NS	Norfolk Southern	Evans Distribution Systems	Detroit	Warehouse	9 spots
WMI	West Michigan Railroad	Hanson Cold Storage	Hartford	Warehouse	8 spots

Source: CN, CSX, NS, MDOT, short-line survey

Table B-9. Rail-Served Grain Elevators

City	Serving Railroad	Name of Facility	Capacity
SCOTTVILLE, MI	Marquette Rail	ACRES COOP INC.	894,000
ELKTON, MI	Huron and Eastern Railway	FARMERS COOPERATIVE GRAIN CO.	100,000
PIGEON, MI	Huron and Eastern Railway	COOPERATIVE ELEVATOR CO.	6,040,000
KINDE, MI	Huron and Eastern Railway	FARMERS COOPERATIVE GRAIN CO.	2,300,000
ELKTON, MI	Huron and Eastern Railway	COOPERATIVE ELEVATOR CO.	5,410,000
PIGEON, MI	Huron and Eastern Railway	ACTIVE FEED CO.	250,000
ELKTON, MI	Huron and Eastern Railway	COOPERATIVE ELEVATOR CO.	860,000
SEBEWAING, MI	Huron and Eastern Railway	BAYSIDE BEST BEANS LLC	139,083
SAGINAW, MI	Huron and Eastern Railway	GAVILON GRAIN LLC	2,451,000
REESE, MI	Huron and Eastern Railway	STAR OF THE WEST MILLING CO.	673,167
RICHVILLE, MI	Huron and Eastern Railway	STAR OF THE WEST MILLING CO.	2,639,542
CARO, MI	Huron and Eastern Railway	POET GRAIN LLC	4,831,000
MILLINGTON, MI	Huron and Eastern Railway	MILLINGTON ELEVATOR AND SUPPLY	290,000

City	Serving Railroad	Name of Facility	Capacity
ITHACA, MI	Huron and Eastern Railway	MID-MICHIGAN SPECIALTY CROPS LLC	274,627
ITHACA, MI	Huron and Eastern Railway	ZFS ITHACA LLC	4,950,000
MIDDLETON, MI	Huron and Eastern Railway	MICHIGAN AGRICULTURAL COMMODITIES INC.	5,300,000
OAKLEY, MI	Huron and Eastern Railway	THE ANDERSONS INC. - OAKLEY CORN PLANT	4,635,000
OAKLEY, MI	Huron and Eastern Railway	THE ANDERSONS INC. - OAKLEY TOWN PLANT	2,500,000
DECKERVILLE, MI	Huron and Eastern Railway	COOPERATIVE ELEVATOR CO.	75,000
DURAND, MI	Huron and Eastern Railway	HARVEST MILLS INC.	400,000
LOWELL, MI	Grand Rapids Eastern Railroad	KING MILLING CO.	2,800,000
MARYSVILLE, MI	CSX Transportation	MARYSVILLE ETHANOL LLC	500,000
HOLLAND, MI	CSX Transportation	CHS INC. (DBA CHS - HAMILTON)	123,000
POTTERVILLE, MI	Canadian National Railway	CITIZENS LLC	844,000
CHARLOTTE, MI	Charlotte Southern Railroad	CITIZENS LLC	1,077,000
CHARLOTTE, MI	Charlotte Southern Railroad	EATON FARM BUREAU COOP INC.	2,300,000
ALBION, MI	Norfolk Southern Railway	THE ANDERSONS INC. - ALBION GRAIN DIV	3,821,000
DUNDEE, MI	Ann Arbor Railroad	JOHN MARION INC.	967,000
BLISSFIELD, MI	Adrian and Blissfield Railroad	VALERO GRAIN MARKETING LLC	2,400,000
BLISSFIELD, MI	Adrian and Blissfield Railroad	MICHIGAN AGRICULTURAL COMMODITIES INC.	3,890,000
WHITE PIGEON, MI	Grand Elk Railroad	THE ANDERSONS INC. - WHITE PIGEON TERMINAL	5,530,000
OTTAWA LAKE, MI	Norfolk Southern Railway	OTTAWA LAKE COOP ELEVATOR	950,000
OTTAWA LAKE, MI	Norfolk Southern Railway	ARCHER DANIELS MIDLAND CO. (DBA ADM GRAIN CO.)	11,823,000
STANDISH, MI	Lake State Railway	THE ANDERSONS INC. - STANDISH	3,337,000
TURNER, MI	Lake State Railway	TURNER BEAN AND GRAIN INC.	75,000
SHEPHERD, MI	Huron and Eastern Railway	SHEPHERD ELEVATOR	1,700,000
NEWAYGO, MI	Marquette Rail	MICHIGAN AGRICULTURAL COMMODITIES INC.	3,300,000
AKRON, MI	Huron and Eastern Railway	COOPERATIVE ELEVATOR CO.	2,690,000
UNIONVILLE, MI	Huron and Eastern Railway	COOPERATIVE ELEVATOR CO.	170,000
AKRON, MI	Huron and Eastern Railway	MICHIGAN BEAN CO. LLC - AKRON	50,000

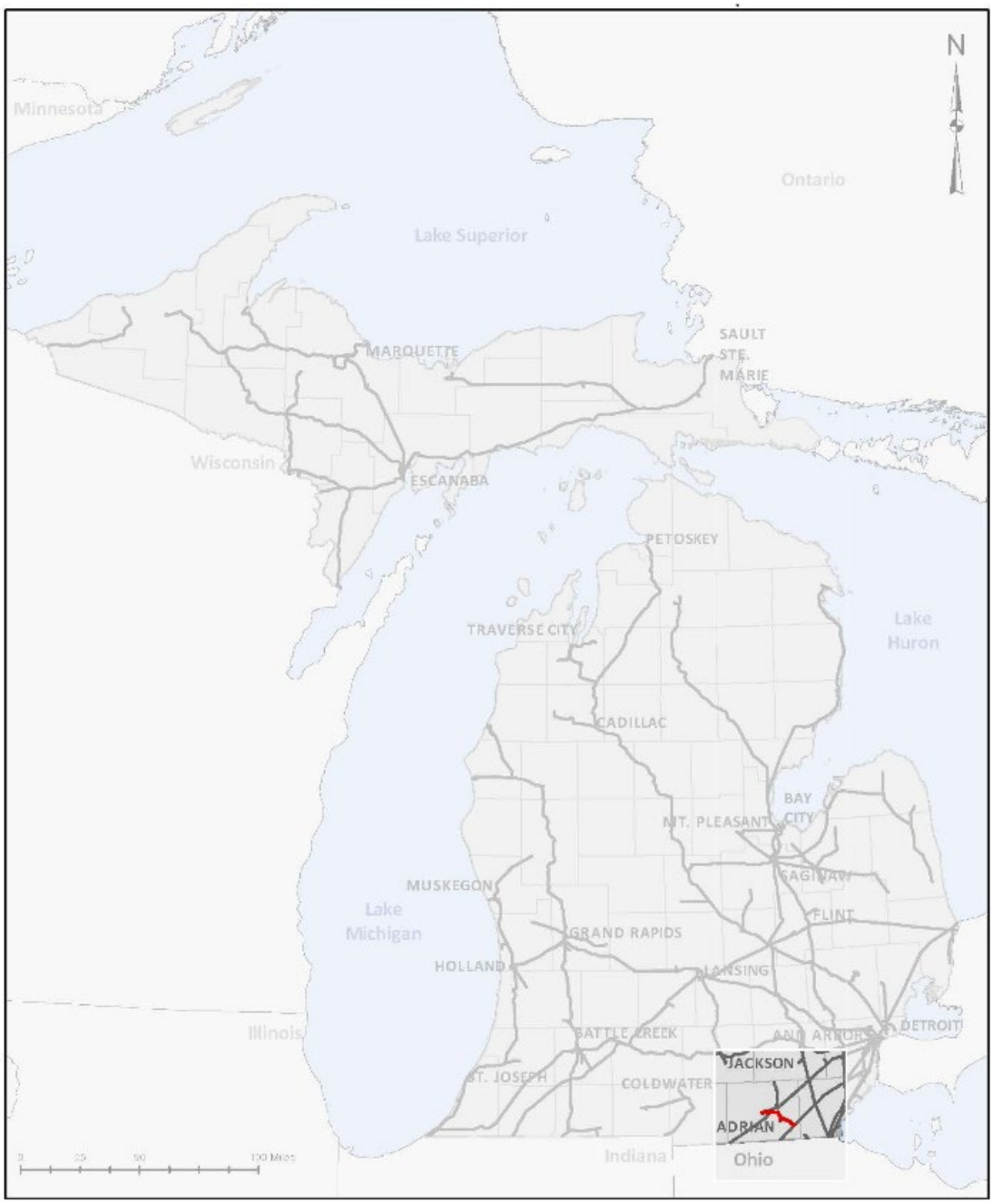
City	Serving Railroad	Name of Facility	Capacity
GILFORD, MI	Huron and Eastern Railway	STAR OF THE WEST MILLING CO.	1,420,487
FAIRGROVE, MI	Huron and Eastern Railway	STAR OF THE WEST MILLING CO.	554,701
RUTH, MI	Huron and Eastern Railway	COOPERATIVE ELEVATOR CO.	3,725,000
UBLY, MI	Huron and Eastern Railway	ADM EDIBLE BEAN SPECIALTIES	1,833,000
AUBURN, MI	Huron and Eastern Railway	ITTNER BEAN AND GRAIN INC.	1,385,000
FREELAND, MI	Lake State Railway	FREELAND BEAN AND GRAIN INC.	647,000
BAY CITY, MI	Lake State Railway	GAVILON GRAIN LLC	1,303,000
MUNGER, MI	Huron and Eastern Railway	EVERBEST ORGANICS INC.	813,972
REESE, MI	Huron and Eastern Railway	ADM EDIBLE BEAN SPECIALTIES	685,000
FREMONT, MI	Mid-Michigan Railroad	CERES SOLUTIONS, INC.	600,000
WHEELER, MI	Mid-Michigan Railroad	M.I. AGRICULTURAL COMMODITIES INC. - RANSOM FACILITY	8,071,000
HEMLOCK, MI	Mid-Michigan Railroad	THE ANDERSONS INC. - HEMLOCK	4,687,000
FRANKENMUTH, MI	Huron and Eastern Railway	STAR OF THE WEST MILLING CO.	2,840,724
MARLETTE, MI	Huron and Eastern Railway	MICHIGAN AGRICULTURAL COMMODITIES INC.	4,010,000
BROWN CITY, MI	Huron and Eastern Railway	BROWN CITY ELEVATOR	76,000
BROWN CITY, MI	Huron and Eastern Railway	MICHIGAN AGRICULTURAL COMMODITIES INC.	3,100,000
SAGINAW, MI	Lake State Railway	GREAT LAKES GRAIN AND TRANSPORTATION LLC	400
LENNON, MI	Huron and Eastern Railway	MORNING STAR GRAIN LLC	464,000
HENDERSON, MI	Huron and Eastern Railway	MICHIGAN AGRICULTURAL COMMODITIES INC.	530,000
EMMETT, MI	Canadian National Railway	STAR OF THE WEST MILLING CO.	1,994,000
ZEELAND, MI	CSX Transportation	JOHN A VAN DEN BOSCH CO.	65,000
LAKE ODESSA, MI	CSX Transportation	CALEDONIA FARMERS ELEVATOR CO.	380,000
LAKE ODESSA, MI	CSX Transportation	CALEDONIA FARMERS ELEVATOR CO.	1,117,000
LAKE ODESSA, MI	CSX Transportation	CARBON GREEN BIOENERGY LLC	1,800,000
GRAND LEDGE, MI	CSX Transportation	ARCHER DANIELS MIDLAND CO. (DBA ADM GRAIN CO.)	7,446,000
HAMILTON, MI	CSX Transportation	CHS	1,445,000
LANSING, MI	Canadian National Railway	PURINA MILLS LLC (DBA PURINA ANIMAL NUTRITION)	26,360
WEBBERVILLE, MI	CSX Transportation	ARCHER DANIELS MIDLAND CO. (DBA ADM GRAIN CO.)	6,385,000

City	Serving Railroad	Name of Facility	Capacity
LESLIE, MI	Jackson and Lansing Railroad	EATON FARM BUREAU COOP INC.	388,000
MASON, MI	Jackson and Lansing Railroad	EATON FARM BUREAU COOP INC.	1,700,000
BATTLE CREEK, MI	Canadian National Railway	CITIZENS LLC	675,000
AUGUSTA, MI	Norfolk Southern Railway	KNAPPEN MILLING CO.	2,043,000
CHELSEA, MI	Norfolk Southern Railway	CHELSEA MILLING CO.	1,028,000
DECATUR, MI	Amtrak	CARGILL INC.	4,425,000
BRITTON, MI	Norfolk Southern Railway	IDA FARMERS CO-OPERATIVE BRITTAN	425,000
QUINCY, MI	Indiana Northeastern Railroad	STAR OF THE WEST MILLING CO.	532,892
QUINCY, MI	Indiana Northeastern Railroad	STAR OF THE WEST MILLING CO.	998,201
READING, MI	Indiana Northeastern Railroad	THE ANDERSONS INC. - READING	4,513,000

B.1. ADRIAN AND BLISSFIELD

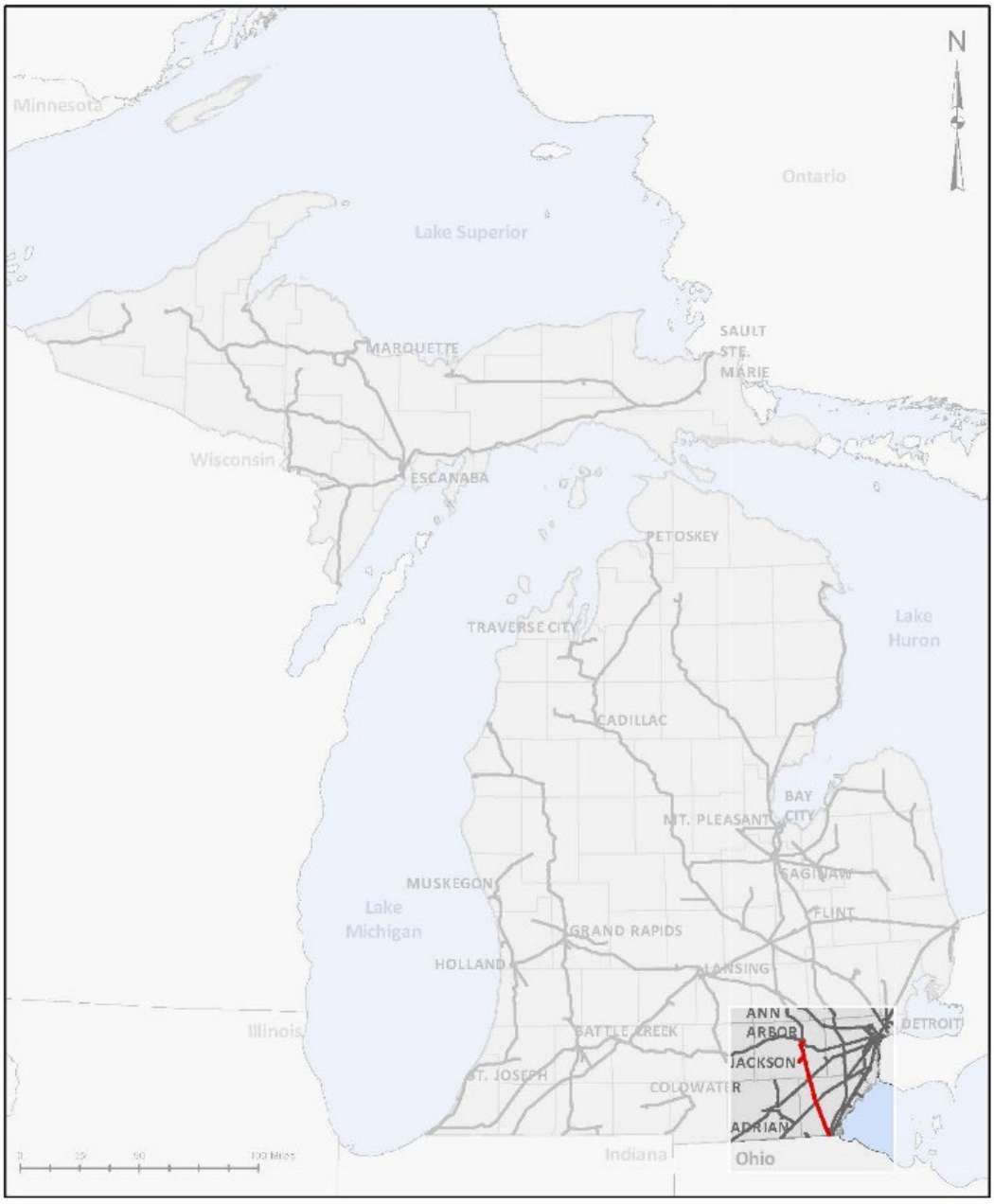
The Adrian and Blissfield Rail Road Co. (ADBF) is a short-line independent railroad operating 21 miles of track in southeast Michigan. ADBF also doubles as a holding company, operating four other short-line railroads in the state. ADBF's railroad line is one of the oldest operating in the U.S., having been originally built in 1834. In addition to hauling freight, the railroad operates a dinner train known as "The Old Road Dinner Train" in Blissfield and Charlotte.

No data provided by the railroad.



B.2. ANN ARBOR RAILROAD

The Ann Arbor Railroad is a short-line railroad operating 61 miles of track through northwest Ohio and southeast Michigan, owned by holding company Watco. It interchanges with the Great Lakes Central Railroad and Norfolk Southern Railway in Ann Arbor, the Norfolk Southern in Milan, and the Canadian National and Indiana and Ohio railways in Diann. The railroad transports auto parts and finished vehicles, serving customers Chrysler, General Motors, Ford, Volkswagen, and Nissan, as well as a full range of bulk commodities.



Infrastructure Profile

Category	Amount
Route Miles Owned	61.1
Route Miles Leased	0
Miles of Trackage Rights	0
Miles of Out-of-Services Track	0
Class 1 Miles	23.9
Class 2 Miles	24.9
Class 3 Miles	0
Excepted Track Miles	0
Non-286K-Capable Track Miles	N/A
Total Bridges	12
Non-286K-Capable Bridges	0

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	1,087	6,371	1143	6,315	**7,458**
2015	981	6,003	302	6,682	**6,984**
2016	1,002	8,354	1084	8,272	**9,356**
2017	1,661	8,641	1503	8,799	**10,302**
2018	3,251	7,032	2323	7,960	**10,283**

Rail Operations

End to End Transit Time	Operating Speed (MPH)
N/A	10 to 40

Public Benefits

Employees	In-State Purchases
1	N/A

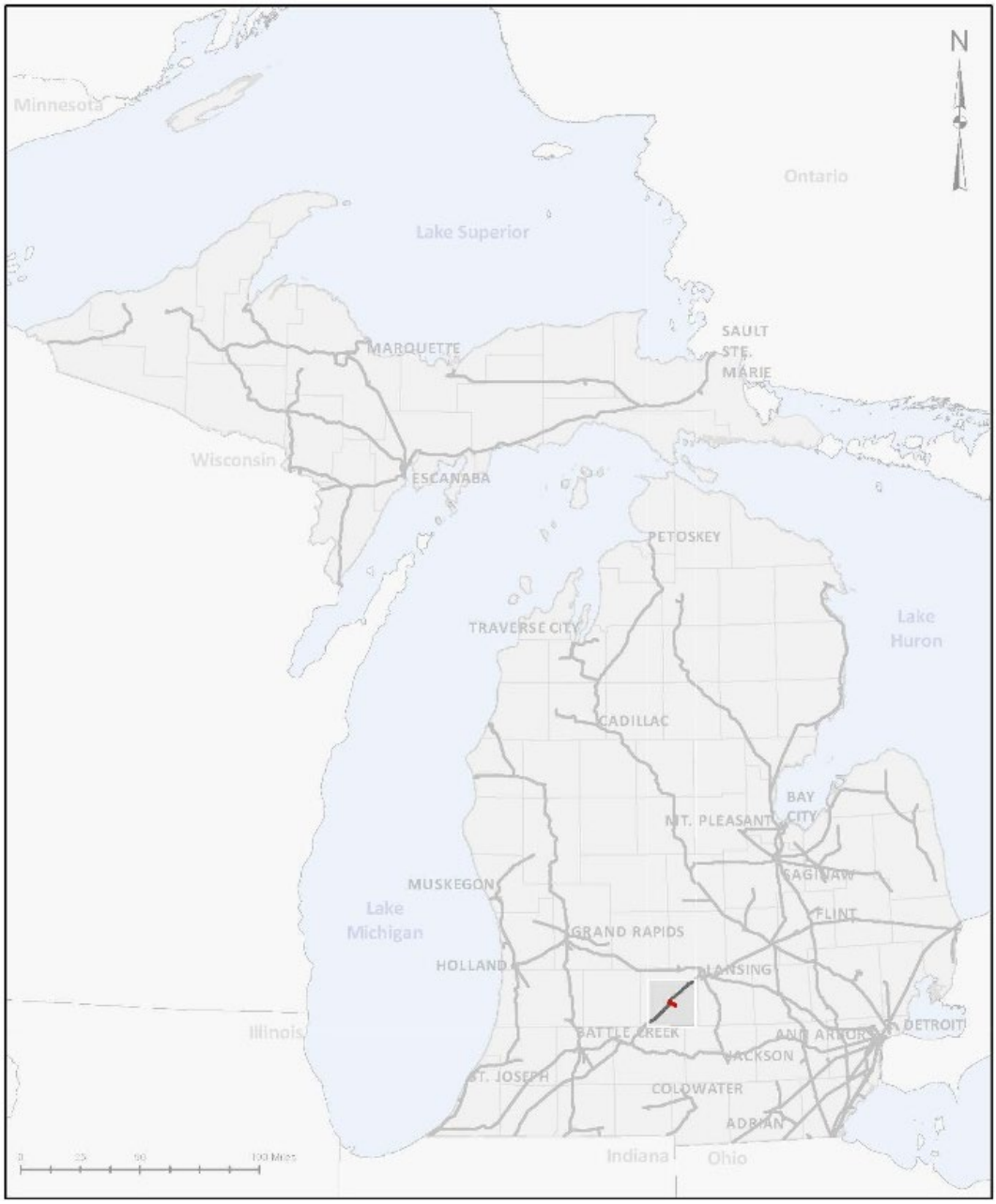
Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Cement	1,417
	Fertilizer	2,439
	Plastics	479
Outbound	Corn, Wheat, Soy	8,848
	Refined Energy	832
	Lumber	408
	Crude Oil	709

B.3. CHARLOTTE SOUTHERN RAILROAD

The Charlotte Southern Railroad (CHS) is a short-line railroad operating 3 miles of track in mid-Michigan, owned by ADBF. The CHS connects freight customers in Charlotte with the Canadian National Railway, and it also hosts ADBF's The Old Road Dinner Train once a month.

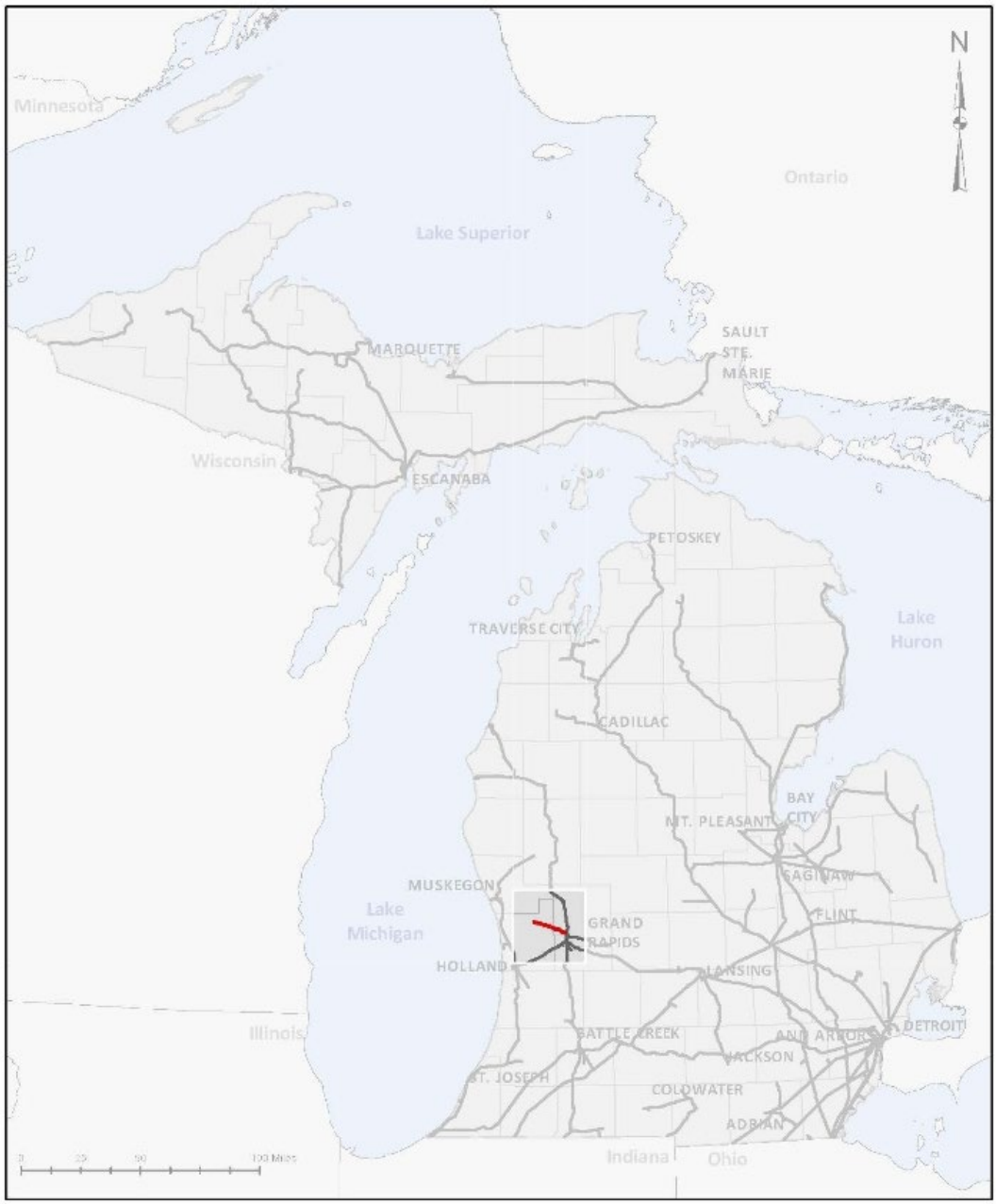
No data provided by the railroad.



B.4. COOPERSVILLE AND MARNE RAILWAY

The Coopersville and Marne Railway is an independent, volunteer-maintained and operated historic railway in west Michigan. The Coopersville and Marne Railway operates passenger excursion trains on a 7-mile stretch of track between Coopersville and Marne, hauling freight for customers located along another 7-mile segment between Marne and Grand Rapids. It interchanges with the Grand Rapids Eastern Railroad, CSXT, and the Grand Elk Railroad in Walker.

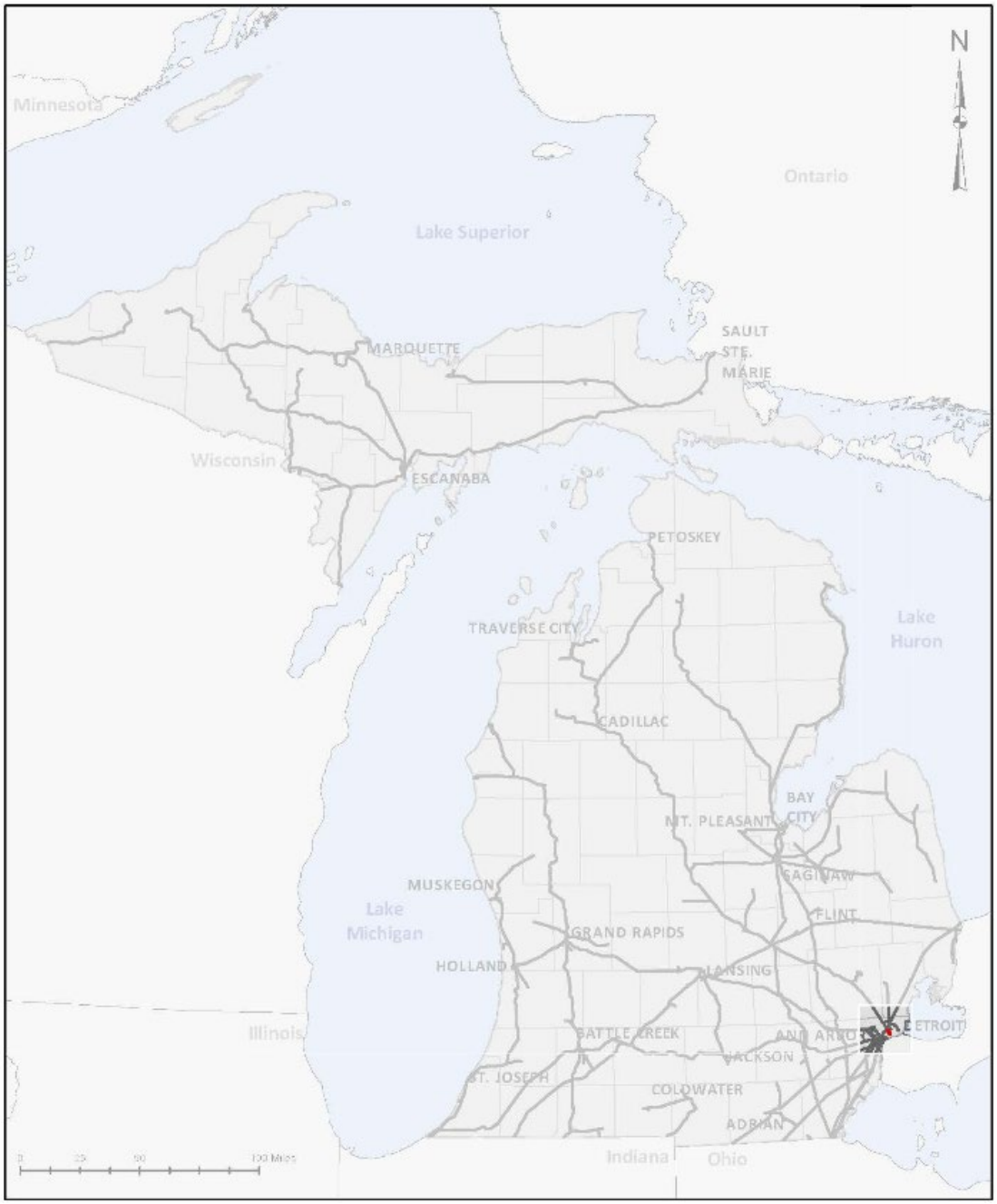
No data provided by the railroad.



B.5. DETROIT CONNECTING RAILROAD

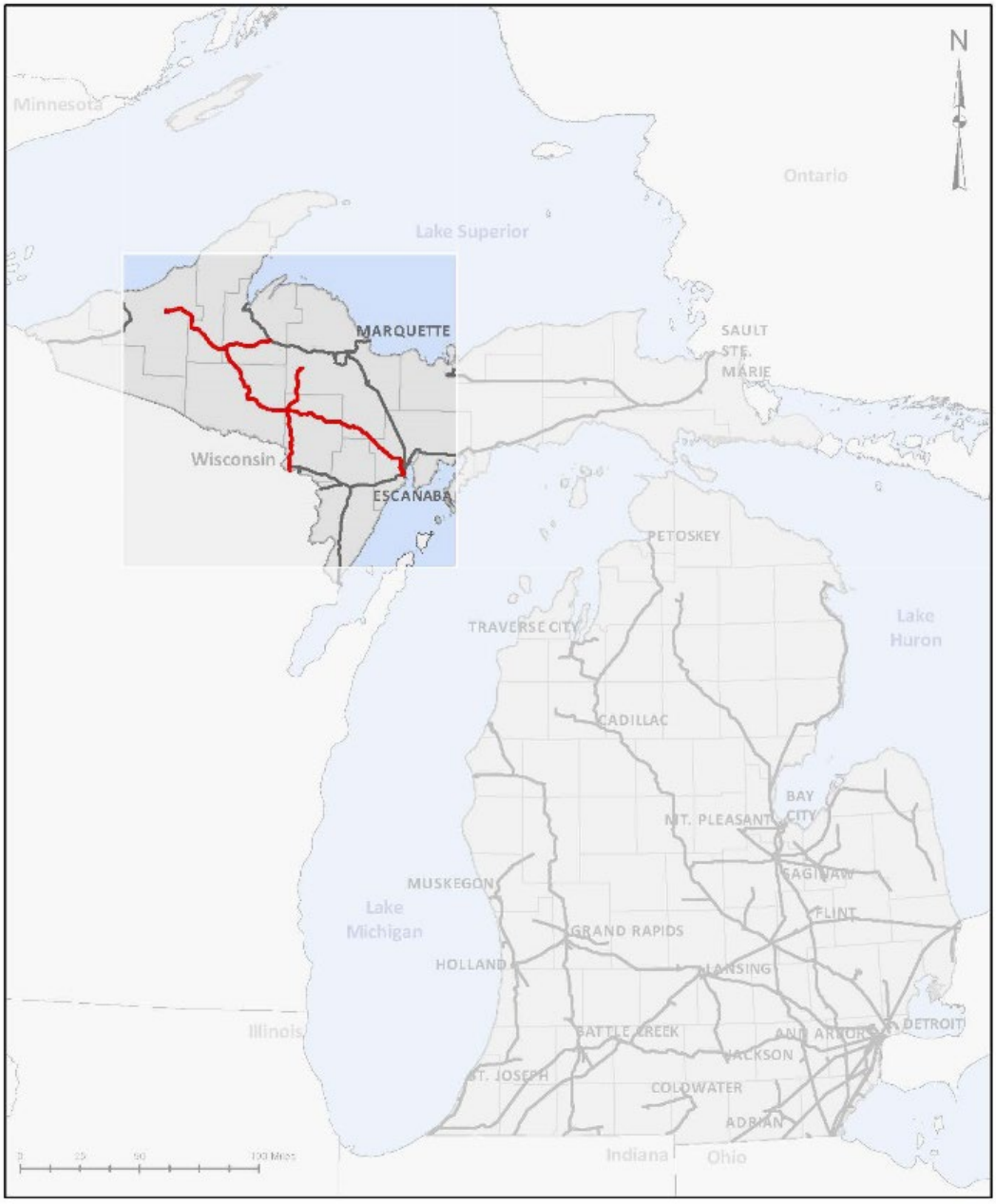
The Detroit Connecting Railroad (DCON) is a short-line railroad operating a 2-mile rail spur in Detroit's Eastern Market and Milwaukee Junction District, owned by ADBF. The DCON interchanges with the Canadian National Railway.

No data provided by the railroad.



B.6. ESCANABA AND LAKE SUPERIOR RAILROAD CO.

The Escanaba and Lake Superior Railroad Co. (ELS) is a short-line independent railroad operating in northeast Wisconsin and Michigan's Upper Peninsula. ELS interchanges with the Canadian National Railway in north Escanaba. The railroad transports lumber and forest products, scrap metal and steel, cement, ore, chemicals, food products, and agricultural commodities.



Infrastructure Profile

Category	Amount
Route Miles Owned	182.5
Route Miles Leased	0
Miles of Trackage Rights	60
Miles of Out-of-Services Track	0
Class 1 Miles	N/A
Class 2 Miles	104.2
Class 3 Miles	N/A
Excepted Track Miles	2.2
Non-286K-Capable Track Miles	0
Total Bridges	15
Non-286K-Capable Bridges	N/A

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	1,312	2,566	1,669	Not applicable	**5,547**
2015	1,556	2,332	1,854	Not applicable	**5,742**
2016	1,833	2,672	1,808	Not applicable	**6,313**
2017	1,662	2,153	1,762	Not applicable	**5,577**
2018	1,517	2,205	1,790	Not applicable	**5,512**

Rail Operations

End to End Transit Time	Operating Speed (MPH)
N/A	10 to 25

Public Benefits

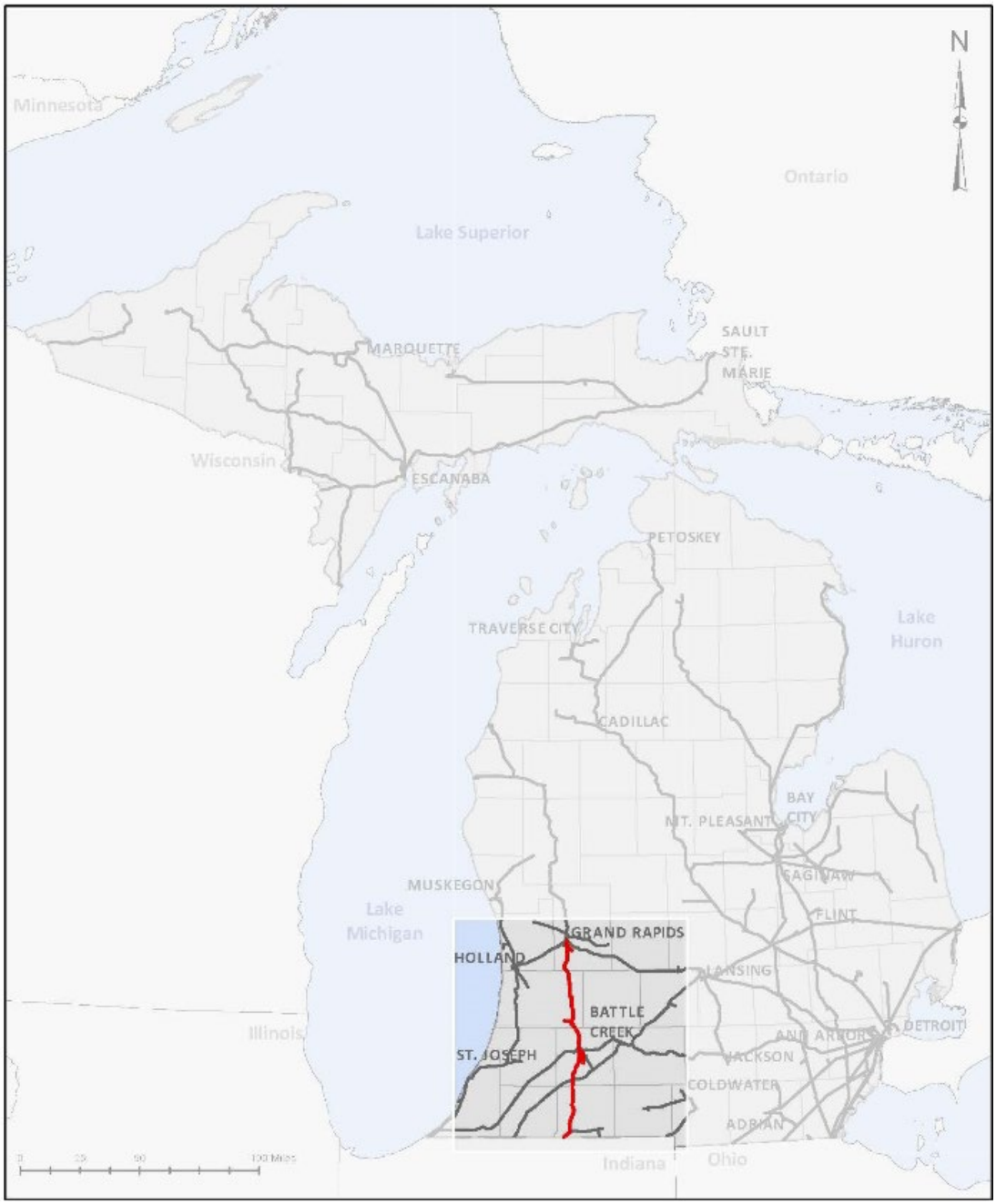
Employees	In-State Purchases
50	$400,000

Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Wood Pulp	656
	Propane	330
	Lumber	102
	Pulpwood Logs	62
Outbound	Pulpwood Logs	1,059
	Cor	256
	Iron Ore	118
	Iron and Steel Scrap	107

B.7. GRAND ELK RAILROAD

The Grand Elk Railroad (GDLK) is a short-line railroad operating 123 miles of track in west Michigan and north Indiana, owned by holding company Watco. GDLK operates along track leased from the Norfolk Southern Railway, interchanging with CSXT, Marquette Rail, and the Grand Rapids Eastern Railroad in Grand Rapids, the Norfolk Southern and Canadian National railways in Kalamazoo, and the Michigan Southern Railroad in White Pigeon. The railroad transports frac sand, plastics, metals, forest products, agricultural products, and aggregates for 55 customers along the route.



Infrastructure Profile

Category	Amount
Route Miles Owned	0
Route Miles Leased	103
Miles of Trackage Rights	7
Miles of Out-of-Services Track	0
Class 1 Miles	7
Class 2 Miles	46
Class 3 Miles	39
Excepted Track Miles	11
Non-286K-Capable Track Miles	N/A
Total Bridges	52
Non-286K-Capable Bridges	N/A

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
2015	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
2016	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
2017	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
2018	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Rail Operations

End to End Transit Time	Operating Speed (MPH)
Not applicable	40

Public Benefits

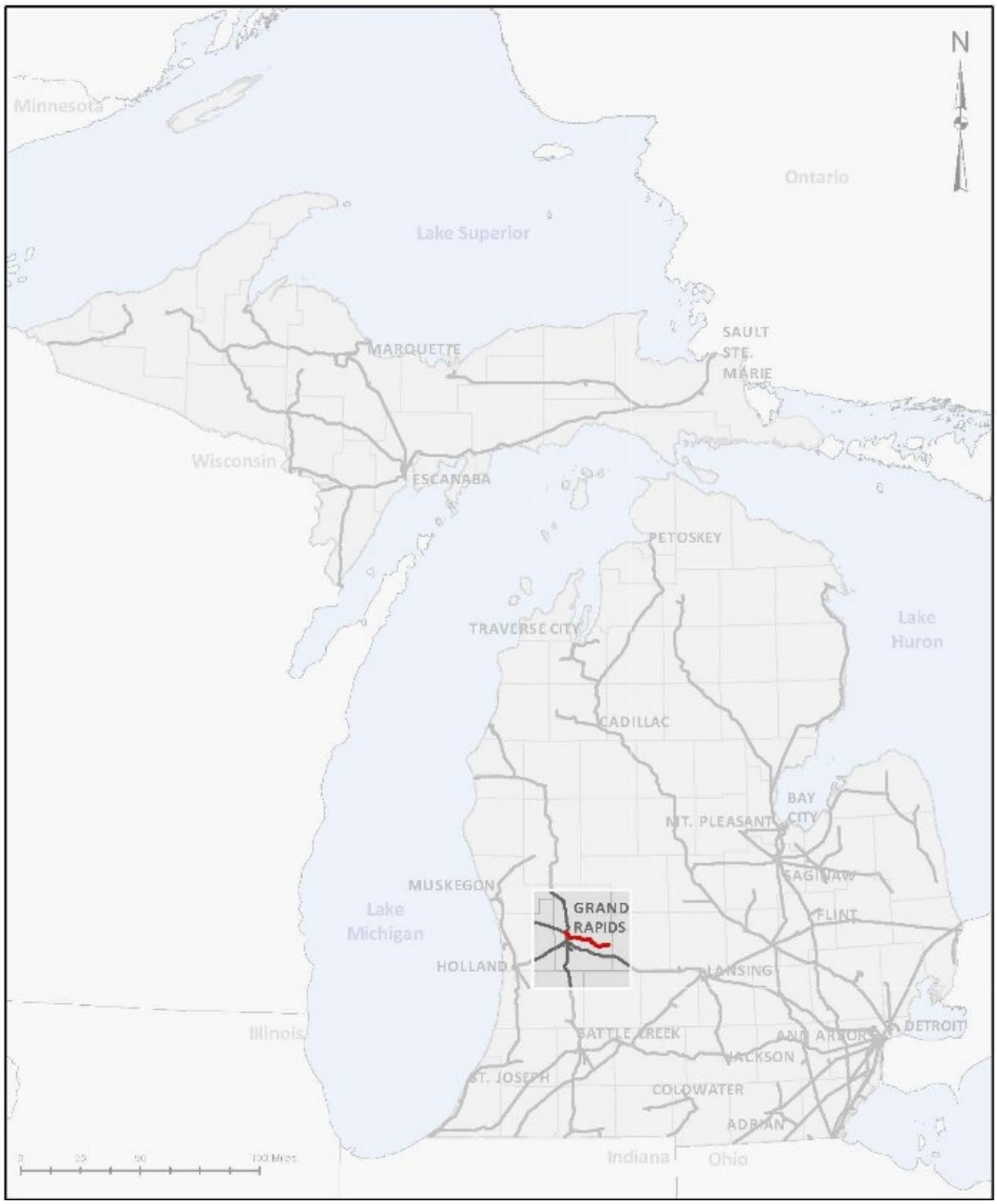
Employees	In-State Purchases
55	Not applicable

Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Plastics	305
Outbound	Pulpboard	1,291
	Wheat	502
	Corn Syrup	387
	Scrap Metal	359

B.8. GRAND RAPIDS EASTERN RAILROAD

The Grand Rapids Eastern Railroad is a short-line railroad operating 27 miles of track in west Michigan, owned by holding company Genesee and Wyoming. It interchanges with CSXT, the Grand Elk Railroad, and the Coopersville and Marne Railway in Grand Rapids. The railroad mostly transports agricultural products, as well as chemicals and plastics.



Infrastructure Profile

Category	Amount
Route Miles Owned	22.3
Route Miles Leased	N/A
Miles of Trackage Rights	N/A
Miles of Out-of-Services Track	N/A
Class 1 Miles	0.2
Class 2 Miles	20.2
Class 3 Miles	N/A
Excepted Track Miles	1.6
Non-286K-Capable Track Miles	N/A
Total Bridges	27
Non-286K-Capable Bridges	12

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	1,101	0	0	16	1,117
2015	1,338	0	0	14	1,352
2016	1,417	17	0	35	1,469
2017	1,403	0	0	50	1,453
2018	1,447	3	0	80	1,530

Rail Operations

End to End Transit Time	Operating Speed (MPH)
6 hours	10

Public Benefits

Employees	In-State Purchases
3	$200,000

Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Agricultural Products	1,199
	Chemicals and Plastics	234
	Minerals and Stone	13
	Food and Kindred Products	1
Outbound	Agricultural Products	2
	Chemicals and Plastics	1

B.9. GREAT LAKES CENTRAL RAILROAD

The Great Lakes Central Railroad is the largest regional railroad in the state, operating 400 miles of track through central and north Michigan. The Great Lakes Central Railroad interchanges with the Canadian National Railway and Huron Eastern Railway in Durand, CSXT in Howell, the Norfolk Southern Railway via the Ann Arbor Railroad in Ann Arbor, and the Mid-Michigan Railroad in Alma. The railroad transports grain, fertilizers, chemicals, plastics, sand, lumber, and coke.

Infrastructure Profile

Category	Amount
Route Miles Owned	19.5
Route Miles Leased	340
Miles of Trackage Rights	N/A
Miles of Out-of-Services Track	N/A
Class 1 Miles	N/A
Class 2 Miles	128.5
Class 3 Miles	271.5
Excepted Track Miles	38.3
Non-286K-Capable Track Miles	137.3
Total Bridges	N/A
Non-286K-Capable Bridges	1

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	3,052	5,262	40	1,535	9,889
2015	3,116	5,004	3	1,846	9,969
2016	2,935	4,802	2	3,497	11,236
2017	4,207	4,623	3	4,837	13,670
2018	5,173	5,102	2	4,416	14,693

Rail Operations

End to End Transit Time	Operating Speed (MPH)
10 hours	25

Public Benefits

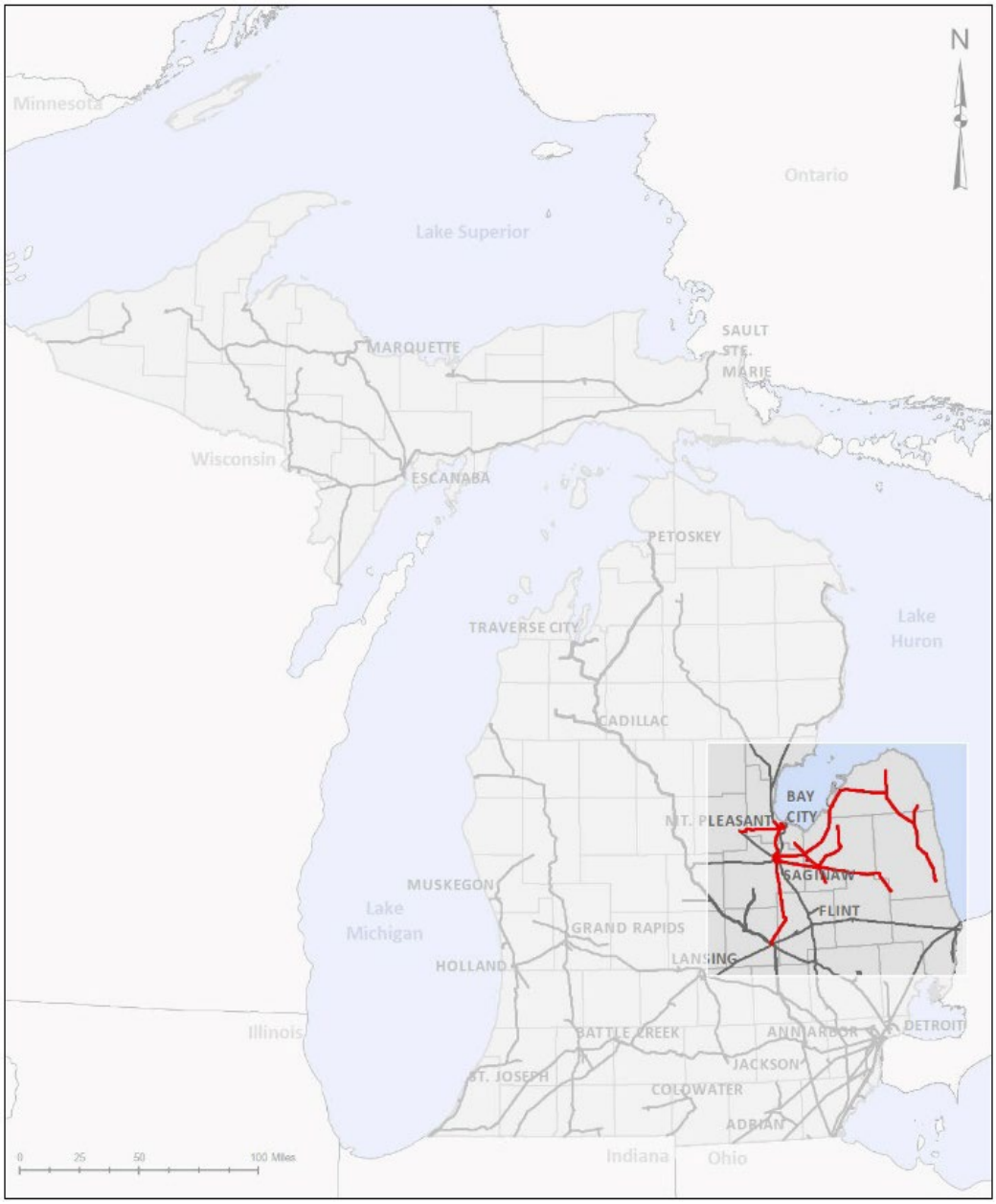
Employees	In-State Purchases
53	Not applicable

Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Chemicals	1,377
	Waste Material	1,230
	Hazardous	1,036
	Concrete / Clox	496
	Food	398
Outbound	Farm Products	3,118
	Mineral	1,125
	Lumber	509
	Chemicals	87
	Waste Material	38

B.10. HURON AND EASTERN RAILWAY CO.

The Huron and Eastern Railway Co. is a short-line railroad operating 394 miles of track through the thumb and Flint/Tri-Cities area of Michigan, owned by holding company Genesee and Wyoming. It interchanges with the Canadian National Railway and Grand Lakes Central Railroad in Durand and the Lake State Railway in Saginaw and Bay City. The railroad mostly transports coal and coke, chemicals and plastics, food and kindred products, and metals.



Infrastructure Profile

Category	Amount
Route Miles Owned	270.7
Route Miles Leased	44
Miles of Trackage Rights	N/A
Miles of Out-of-Services Track	N/A
Class 1 Miles	150
Class 2 Miles	97
Class 3 Miles	N/A
Excepted Track Miles	44.8
Non-286K-Capable Track Miles	N/A
Total Bridges	121
Non-286K-Capable Bridges	7

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	13,530	13,478	1,902	4,400	33,310
2015	19,987	13,639	2,374	3,872	39,872
2016	15,729	13,112	2,535	4,056	35,432
2017	14,585	11,144	2,829	5,126	33,684
2018	14,201	9,490	2,119	7,129	32,939

Rail Operations

End to End Transit Time	Operating Speed (MPH)
5 hours	25

Public Benefits

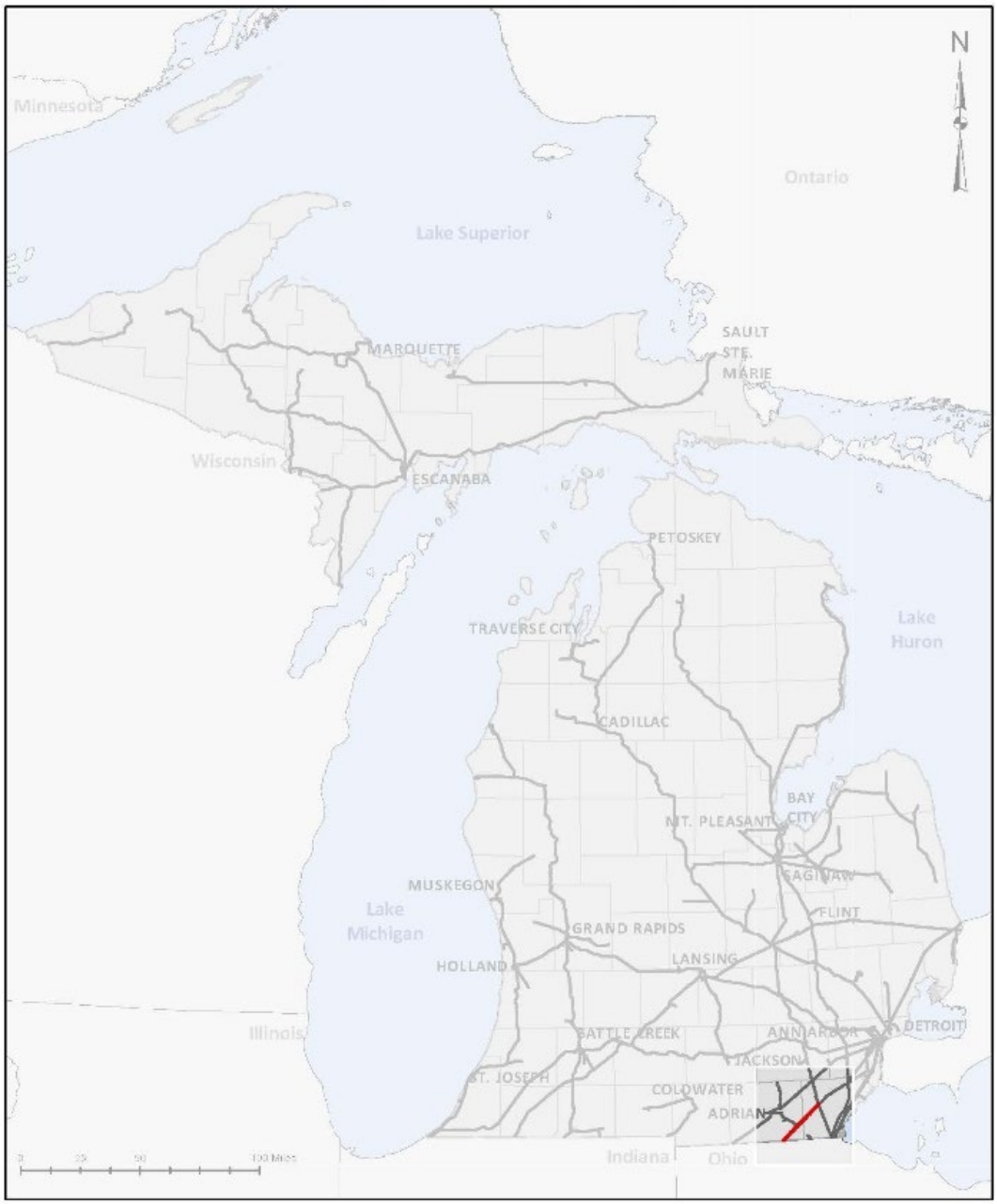
Employees	In-State Purchases
67	$5,100,000

Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Coal and Coke	6,267
	Chemicals and Plastics	5,796
	Metals	444
	Pulp and Paper	418
Outbound	Agricultural Products	5,262
	Chemicals and Plastics	2,200
	Food and Kindred Products	1,494
	Metals	388

B.11. INDIANA AND OHIO RAILWAY CO.

The Indiana and Ohio Railway Co. (IORY) is a short-line railroad operating 543 miles of track through south Michigan, Ohio, and southeast Indiana, owned by holding company Genesee and Wyoming. In Michigan, it interchanges with the Ann Arbor Railroad in Diann, ADBF in Riga, and the Canadian National Railway in Flat Rock. The railroad transports agricultural products, chemicals and plastics, minerals and stone, and metals.



Infrastructure Profile

Category	Amount
Route Miles Owned	21.2

Route Miles Leased	N/A
Miles of Trackage Rights	N/A
Miles of Out-of-Services Track	N/A
Class 1 Miles	N/A
Class 2 Miles	21.2
Class 3 Miles	N/A
Excepted Track Miles	N/A
Non-286K-Capable Track Miles	N/A
Total Bridges	4
Non-286K-Capable Bridges	N/A

Carloads Transported

No data provided by the railroad.

Rail Operations

End to End Transit Time	Operating Speed (MPH)
1.6 hours	25

Public Benefits

Employees	In-State Purchases
0	$400,000

Top Commodities Transported (2018)

No data provided by the railroad.

B.12. INDIANA NORTHEASTERN RAILROAD CO.

The Indiana Northeastern Railroad Co. (IN) is an independent short-line railroad operating 105 miles of track through northeast Indiana, northwest Ohio, and south Michigan. It interchanges with the Norfolk Southern Railway in Montpelier, Ohio. The railroad transports fertilizers, corn and soybeans, plastic pellets, flour, lumber, minerals, and metals.

Infrastructure Profile

Category	Amount
Route Miles Owned	1.9

Route Miles Leased	50.5
Miles of Trackage Rights	0
Miles of Out-of-Services Track	2
Class 1 Miles	16.3
Class 2 Miles	31.9
Class 3 Miles	0
Excepted Track Miles	2.2
Non-286K-Capable Track Miles	9.6
Total Bridges	25
Non-286K-Capable Bridges	2

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	518	2,456	6	—	2,980
2015	569	2,919	—	—	3,488
2016	422	3,781	—	—	4,203
2017	487	2,834	20	—	3,341
2018	328	1,592	—	—	1,920

Rail Operations

End to End Transit Time	Operating Speed (MPH)
4 hours	10 to 20

Public Benefits

Employees	In-State Purchases
8	$750,000

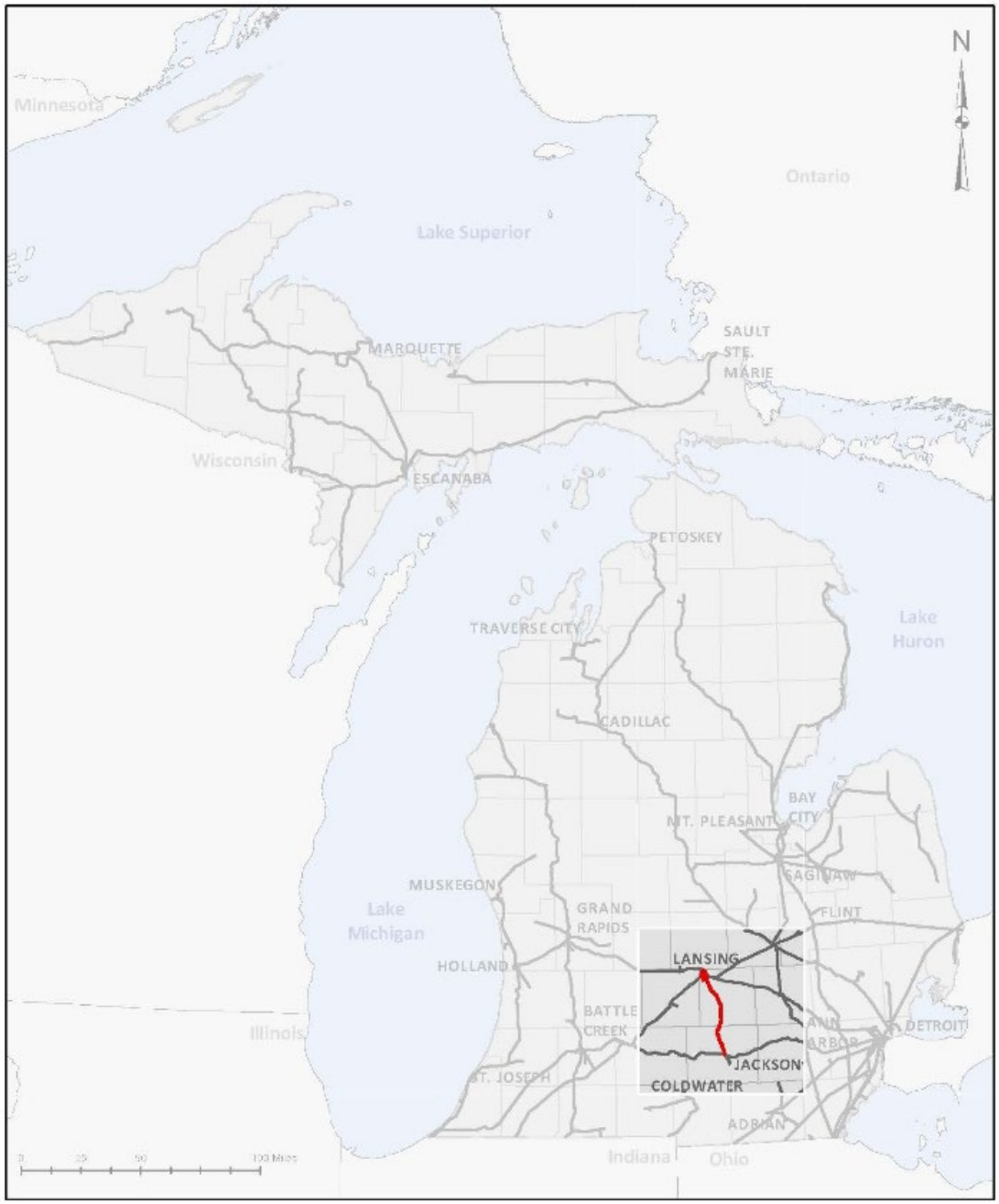
Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Fertilizers	210
	Plastic Pellets	53
	Lumber	35
	Perlite	30
Outbound	Soybeans	1,022
	Flour	173
	Corn	168
	Scrap Steel	135
	Tallow	91

B.13. JACKSON AND LANSING RAILROAD

The Jackson and Lansing Railroad (JAIL) is a short-line railroad operating 47 miles of track between Jackson and north Lansing. The company is owned by ADBF but operates over rail owned by the Norfolk Southern Railway. JAIL interchanges with the Canadian National Railway and CSXT in Lansing and the Norfolk Southern Railway in Jackson.

No data provided by the railroad.



B.14. LAKE STATE RAILWAY CO.

The Lake State Railway Co. is an independent short-line railroad operating 375 miles of track through the Saginaw Valley and northeast Michigan. It interchanges with the Huron and Eastern Railway in Saginaw, Bay City, and Midland, the Mid-Michigan Railroad in Pains, CSXT in Plymouth, and the Canadian National Railway in Flint, Port Huron, and Holly. The railroad transports aggregate and limestone, coal, grain, and chemicals, serving customers Dow Chemical, S.C. Johnson, ConAgra Foods, Archer Daniels Midland, Conrad Yelvington Distributors, and Consumers Energy.

Infrastructure Profile

Category	Amount
Route Miles Owned	190.9
Route Miles Leased	187
Miles of Trackage Rights	11.8
Miles of Out-of-Services Track	N/A
Class 1 Miles	16.7
Class 2 Miles	164.7
Class 3 Miles	53
Excepted Track Miles	106.3
Non-286K-Capable Track Miles	106.3
Total Bridges	N/A
Non-286K-Capable Bridges	N/A

Carloads Transported

No data provided by the railroad.

Rail Operations

End to End Transit Time	Operating Speed (MPH)
Not applicable	10 to 40

Public Benefits

Employees	In-State Purchases
115	Not applicable

Top Commodities Transported (2018)

No data provided by the railroad.

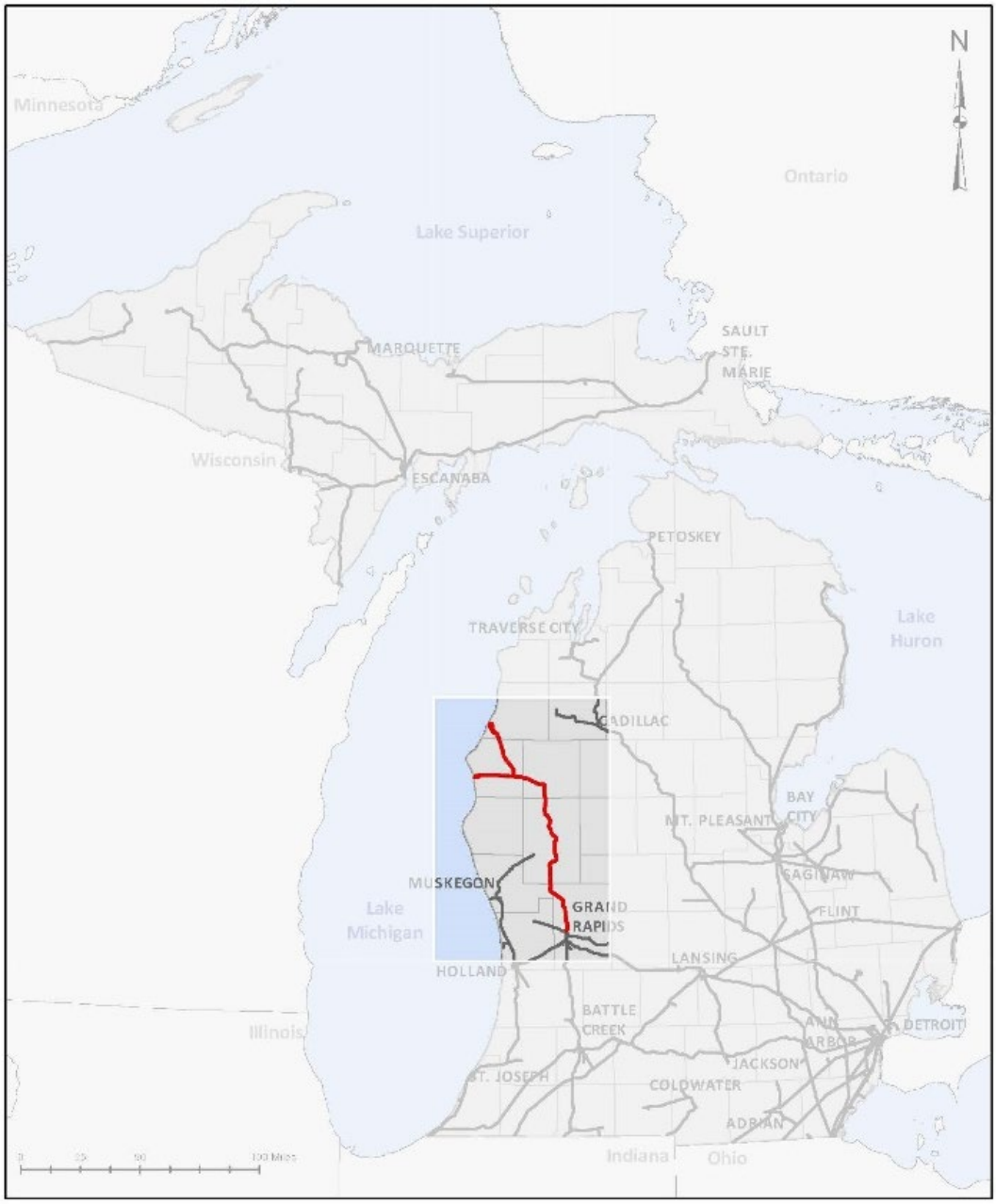
B.15. LAPEER INDUSTRIAL RAILROAD

The Lapeer Industrial Railroad is a short-line railroad operating a 1.5-mile rail spur in Lapeer, owned by ADBF. The Lapeer Industrial Railroad interchanges with the Canadian National Railway. Its customers include Lapeer Grain, Lapeer Industries, and Masco Corp.

No data provided by the railroad.

B.16. MARQUETTE RAIL, LLC

Marquette Rail (MQT) is a short-line railroad operating 162 miles of track in west and north Michigan, owned by holding company Genesee and Wyoming. It interchanges with CSXT and the Grand Elk Railroad in Grand Rapids. The railroad mostly transports chemicals and plastics, minerals and stone, and pulp and paper.



Infrastructure Profile

Category	Amount
Route Miles Owned	N/A
Route Miles Leased	129
Miles of Trackage Rights	N/A
Miles of Out-of-Services Track	N/A
Class 1 Miles	8.2
Class 2 Miles	118
Class 3 Miles	N/A
Excepted Track Miles	3.8
Non-286K-Capable Track Miles	N/A
Total Bridges	34
Non-286K-Capable Bridges	5

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	4,454	15,654	1,644	30	21,782
2015	4,468	13,464	1,345	31	19,308
2016	3,009	9,578	610	29	13,226
2017	2,705	10,382	1,095	24	14,206
2018	2,807	11,710	1,277	15	15,809

Rail Operations

End to End Transit Time	Operating Speed (MPH)
6 hours	20

Public Benefits

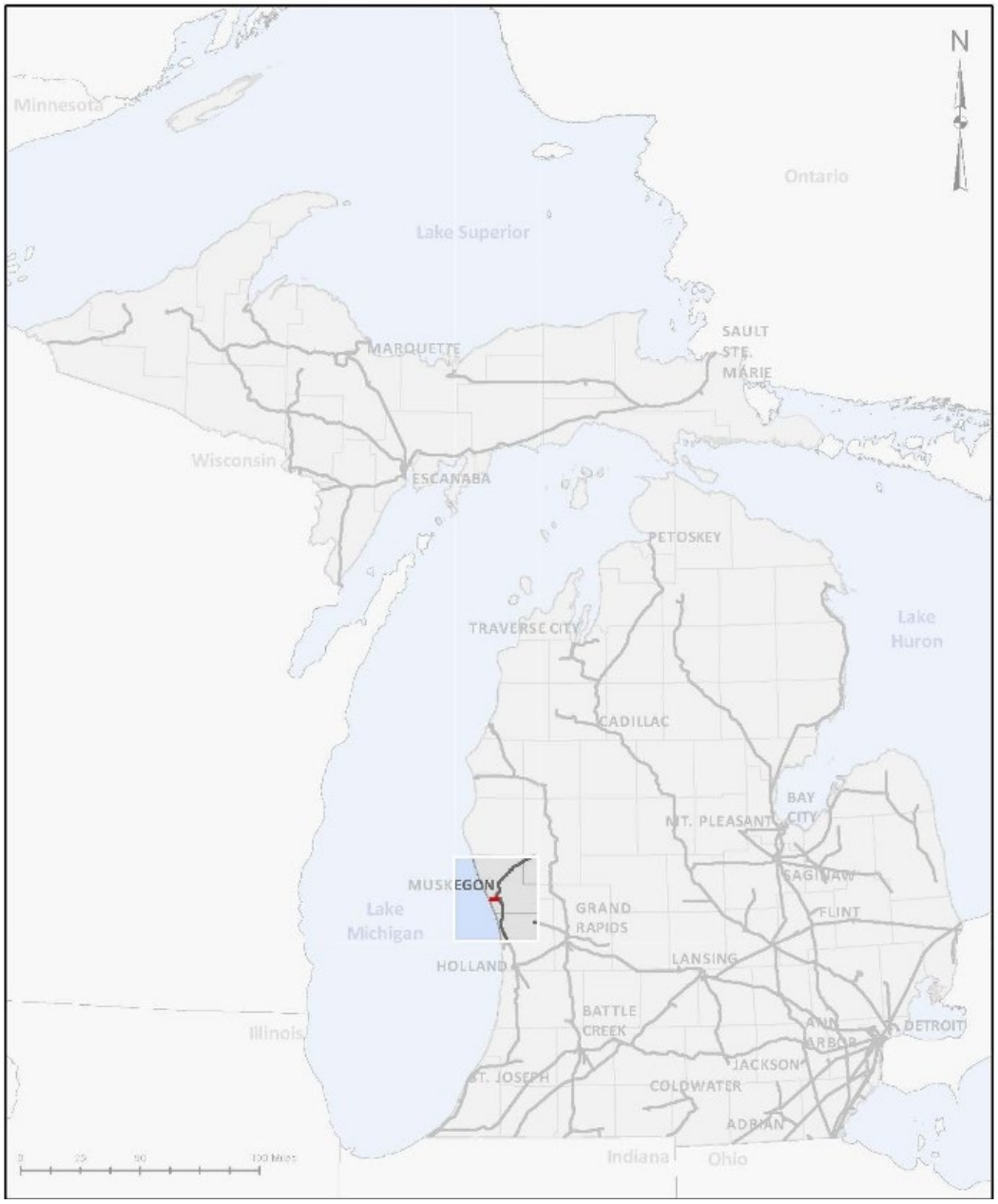
Employees	In-State Purchases
33	$3,700,000

Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Minerals and Stone	1,761
	Chemicals and Plastics	299
	Petroleum Products	260
	Lumber and Forest Products	214
Outbound	Chemicals and Plastics	6,859
	Pulp and Paper	2,475
	Minerals and Stone	2,161
	Other	109

B.17. MICHIGAN SHORE RAILROAD

The Michigan Shore Railroad is a short-line railroad operating 58 miles of track in west Michigan, owned by holding company Genesee and Wyoming. It interchanges with CSXT in Holland. The railroad transports sand and chemicals for the Webb Chemical Co. in Muskegon Heights and sand for the Nugget Sand Co. near Grand Haven.



Infrastructure Profile

Category	Amount
Route Miles Owned	3.7
Route Miles Leased	50
Miles of Trackage Rights	N/A
Miles of Out-of-Services Track	N/A
Class 1 Miles	34.5
Class 2 Miles	19.1
Class 3 Miles	N/A
Excepted Track Miles	N/A
Non-286K-Capable Track Miles	N/A
Total Bridges	16
Non-286K-Capable Bridges	1

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	929	4,277	—	72	5,278
2015	974	1,605	—	0	2,579
2016	1,075	1,249	—	0	2,324
2017	910	638	—	0	1,548
2018	725	717	—	0	1,442

Rail Operations

End to End Transit Time	Operating Speed (MPH)
6 hours	15

Public Benefits

Employees	In-State Purchases
6	$400,000

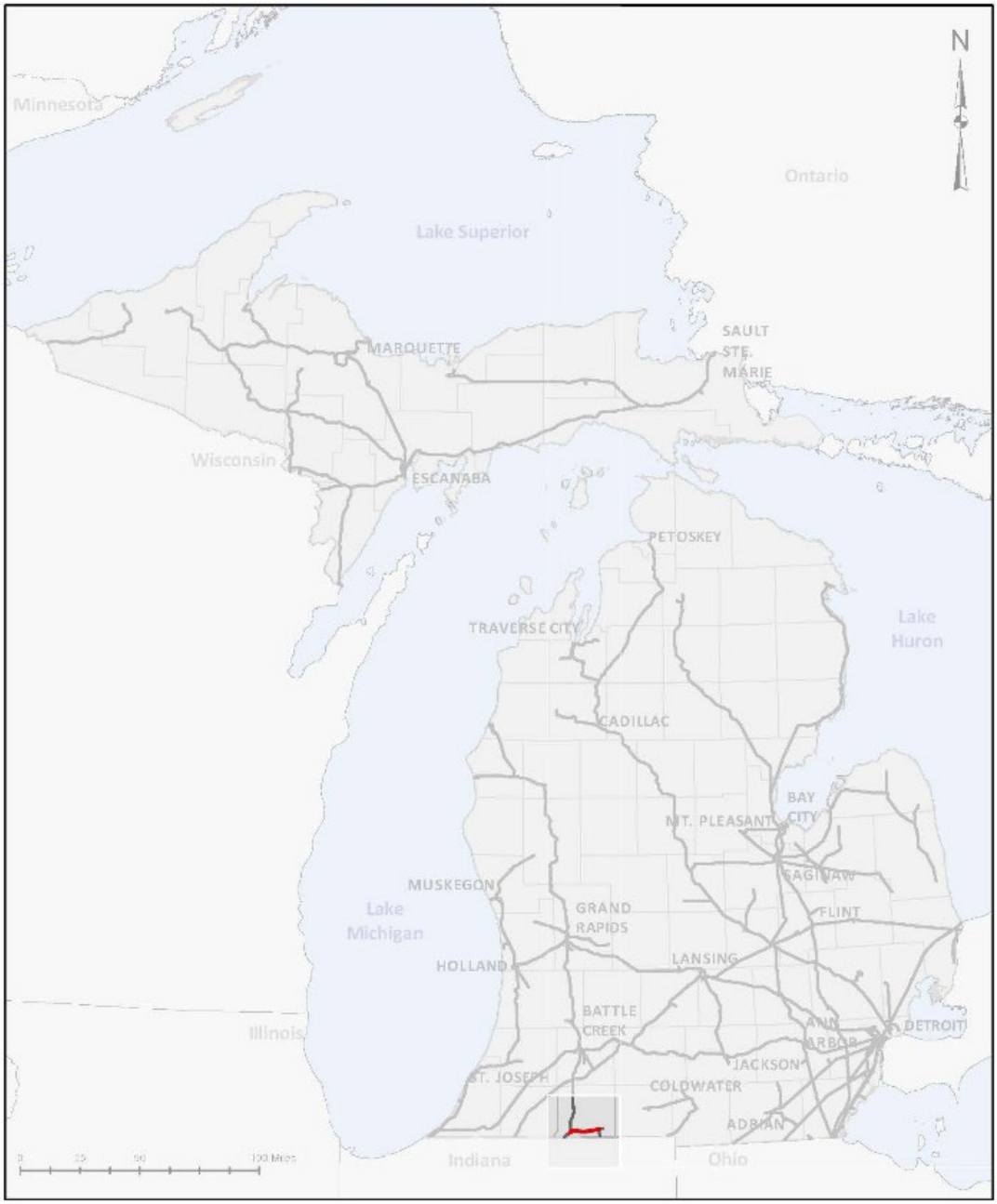
Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Chemicals and Plastics	714
	Petroleum Products	6
	Agricultural Products	5
Outbound	Minerals and Stone	708
	Chemicals and Plastics	9

B.18. MICHIGAN SOUTHERN RAILROAD

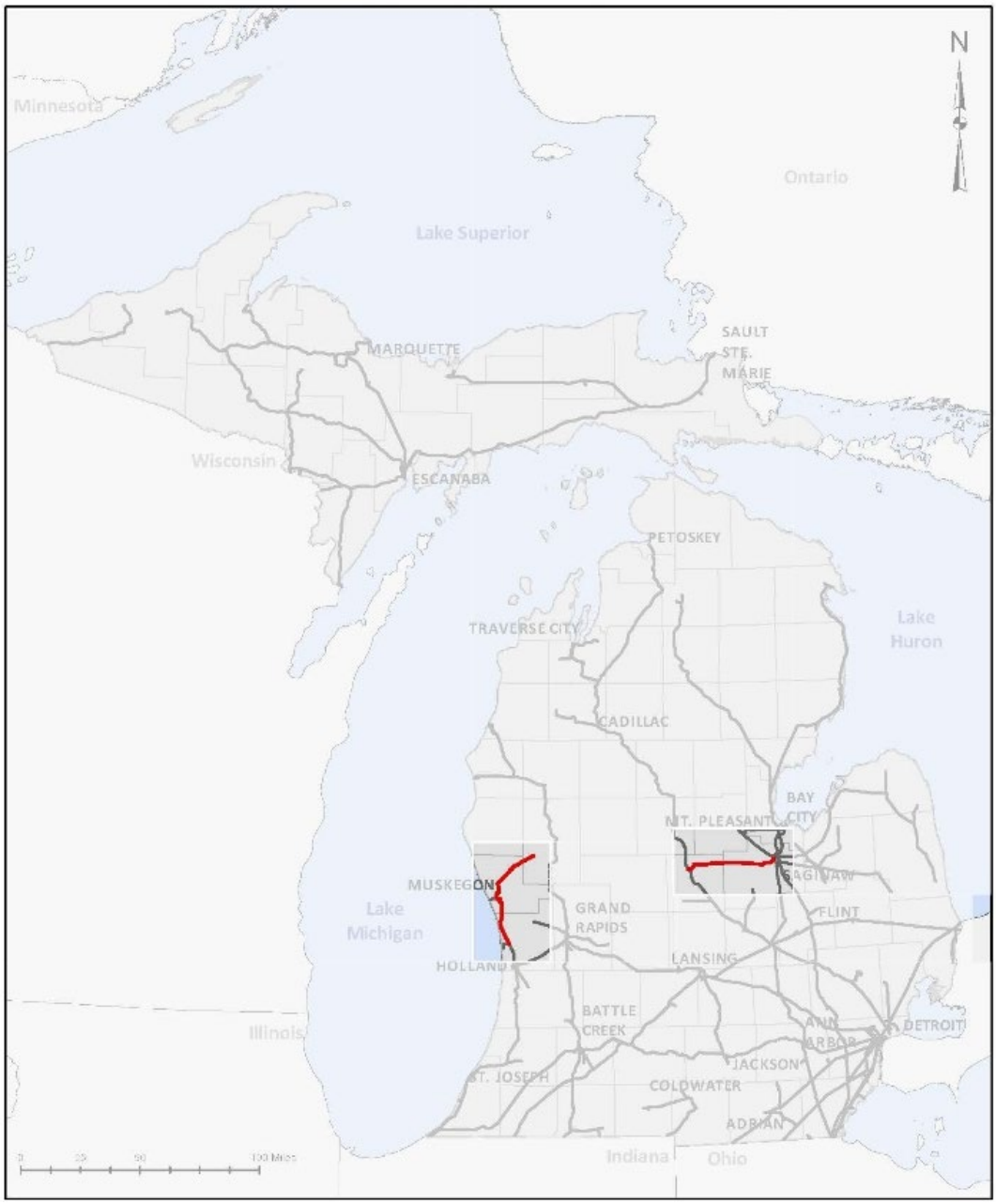
The Michigan Southern Railroad (MSO) is a short-line railroad operating 21 miles of track in southwest Michigan, owned by holding company Pioneer Railcorp. MSO interchanges with the Norfolk Southern Railway in White Pigeon. The railroad transports aggregates, chemicals, food products, grain, lumber, paper, and plastics.

No data provided by the railroad.



B.19. MID-MICHIGAN RAILROAD, INC.

The Mid-Michigan Railroad (MMRR) is a short-line railroad operating 33 miles of track in central Michigan, owned by holding company Genesee and Wyoming. It interchanges with the Great Lakes Central Railroad in Alma and the Lake State Railway in Paines. The railroad mostly transports agricultural commodities, including corn and soybeans, chemicals and plastics, and lumber and forest products.



Infrastructure Profile

Category	Amount
Route Miles Owned	29.8
Route Miles Leased	N/A
Miles of Trackage Rights	N/A
Miles of Out-of-Services Track	N/A
Class 1 Miles	7
Class 2 Miles	22
Class 3 Miles	N/A
Excepted Track Miles	N/A
Non-286K-Capable Track Miles	N/A
Total Bridges	34
Non-286K-Capable Bridges	N/A

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	420	3,695	-	1	4,116
2015	313	3,207	-	14	3,534
2016	407	3,258	-	2	3,667
2017	363	3,134	-	1	3,498
2018	388	2,017	-	1	2,406

Rail Operations

End to End Transit Time	Operating Speed (MPH)
5 hours	15

Public Benefits

Employees	In-State Purchases
4	$400,000

Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Chemicals and Plastics	295
	Lumber and Forest Products	67
	Petroleum Products	21
	Minerals and Stone	4
Outbound	Agricultural Products	1,993
	Chemicals and Plastics	24

B.20. MINERAL RANGE RAILROAD

The Mineral Range Railroad (MRI) is a short-line independent railroad operating 20 miles of track in Michigan's Upper Peninsula. MRI interchanges with the Canadian National Railway in Ishpeming. The railroad transports ammonium, nitrate, and nickel and copper concentrate for customers Humboldt Mine, A&L Iron and Metal, and Pepin-Ireco.

No map available

Infrastructure Profile

Category	Amount
Route Miles Owned	17
Route Miles Leased	N/A
Miles of Trackage Rights	1
Miles of Out-of-Services Track	N/A
Class 1 Miles	17
Class 2 Miles	0
Class 3 Miles	0
Excepted Track Miles	N/A
Non-286K-Capable Track Miles	17
Total Bridges	5
Non-286K-Capable Bridges	5

Carloads Transported

Year	Inbound	Outbound	Local	Overhead	Total
2014	200	3,000	—	—	3,200
2015	200	2,800	—	—	3,000
2016	200	2,800	—	—	3,000
2017	200	2,600	—	—	2,800
2018	200	2,500	—	—	2,700

Rail Operations

End to End Transit Time	Operating Speed (MPH)
4 to 8 hours	10

Public Benefits

Employees	In-State Purchases
5	$500,000

Top Commodities Transported (2018)

Direction	Commodity	Carloads
Inbound	Ammonium Nitrate	200
Outbound	Nickel/Copper Concentrate	2,500

B.21. WEST MICHIGAN RAILROAD

The West Michigan Railroad (WMI) is a short-line, independent railroad operating 14 miles of track in southwest Michigan. The WMI interchanges with CSXT in Hartford. It transports chipped rubber, plastic pellets, methanol, and corn oil.

No data provided by the railroad.