

The Changing Structure of the Soybean Market in Michigan: Infrastructure

August 2022

Michigan Soybean Committee

Bill Knudson

Introduction and Background

Michigan produces more soybeans than it uses. As a result, transportation, soybean handling facilities, and other infrastructure play an important role in distributing soybeans from where they are produced to where they are needed both in domestic and international markets. This will become more important as more soybeans are produced in the Northern Lower Peninsula. Nationwide, farm commodities are major users of rail and water (barges and ships) (Boyer). In Michigan trucking plays a key role in transporting agricultural commodities including soybeans.

Nationwide, trucks accounted for 2.03 trillion ton miles of freight, followed closely by rail with 1.73 trillion ton miles of freight. One ton of cargo shipped one mile equals a ton mile. Grain, animal feed, milled grain products, and other agricultural products accounted for 13.56 percent of all ton miles shipped in the U.S. in 2017 (Department of Transportation).

Of the 50 largest foreign trade gateways in the U.S. two are located in Michigan, Detroit is the eighth largest gateway and Port Huron is the 11th largest gateway. These are the two largest land based gateways in the country (Department of Transportation). These figures indicate that Canada remains an important export market and that Michigan may have opportunities to expand exports to other countries if it can improve water and rail shipping.

Current infrastructure and the proximity to Canada makes Canada a natural outlet for Michigan soybeans. In 2022, Canada imported \$205 million in soybeans, many from Michigan. Unfortunately, Canada is a mature market that is not likely to expand. Supply management in the Canadian dairy and poultry industries further reduces the potential for expanded exports to Canada. Improved infrastructure has the potential to enhance exports to expanding markets.

A key aspect of the soybean supply chain is storage and elevators. Most elevators are located in major crop producing areas of the state. Locating shipping and distribution centers close to existing elevator capacity is likely to be the lowest cost method of handling and shipping soybeans. Current elevator capacity appears to be adequate, but the demand for storage and handling may increase if output rises.

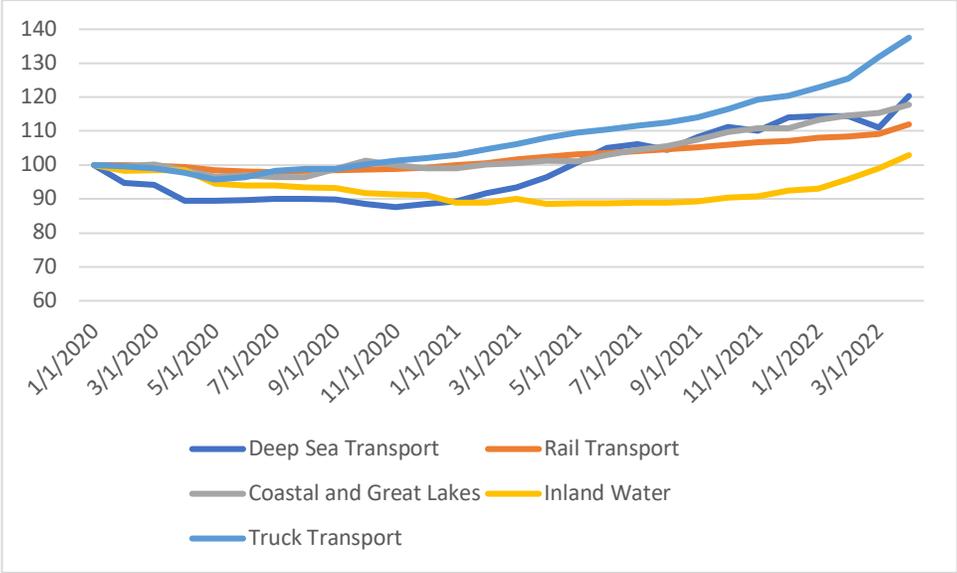
This study analyzes the current state of transportation of soybeans in the state as well as grain handling capacity. It appears that as output increases and more and more crops are grown for specialty purposes such as edible soybeans there will be an increase the need for additional soybean handling capacity. Climate change may also lead to more soybeans grown in the state especially in northern parts of the lower peninsula that traditionally have not produced soybeans. This will place additional demands on soybean handling facilities and transportation.

This paper will also discuss current efforts to address infrastructure issues facing the soybean supply chain. The 2022-2023 budget includes several efforts to enhance the efficiency of the Michigan agri-food system. For example, the Department of Agriculture and Rural Development budget includes \$50 million in one time spending for economic development. Funding for this program is to be used for a grant program that will support community activities including broadband, housing infrastructure, education, workforce development, and other needs. The budget also includes \$2.47 million for the Food and Agriculture Investment Program. Funds in this program can be used for grants, loans or loan guarantees, infrastructure development, and export assistance.

While these are large investments they may not be sufficient to offset further declines in the quality of transportation infrastructure (Oosting and House). High rates of inflation have increased the price of inputs used for road and bridge repair which reduces the amount mileage that can be repaired.

Truck, rail, and water transportation play a role in moving soybeans. All of these types of transportation have seen an increase in shipping rates, especially since the beginning of 2022. Figure 1 shows the relative increases in shipping rates for different modes of transport from January of 2020 to April 1 of 2022.

Figure 1: Rate of Shipping Rate Inflation: January 2020 to April 2022



Source: Federal Reserve Bank of St. Louis

From January of 2020 to the spring of 2021 shipping rates were steady. Since the spring there has been an increase in all shipping rates. From March of 2021 to April of 2022 trucking rates have increased by 29.5 percent; and from January of 2020 to April 2022 the increase has been 37.5 percent. From March of 2021 to April of 2022, inland water freight rates have increased by 14.7 percent, and since January of 2020 rates have increased by only 2.9 percent. Inland shipping rates declined throughout 2020. Most inland water freight is via the Mississippi. From March of 2021 to April of 2022, coastal and Great Lakes transport rates have increased by 17.2 percent. From January 2020 to April 2022 coastal and Great Lake transport rates increased by 17.8 percent. Rates were flat until the spring of 2021. Coastal and Great Lakes rates tracked closely with rail rates until spring of 2021; since then, they have tracked closely with deep sea freight rates. From March of 2021 to April of 2022, deep sea transportation rates have increased by 28.7 percent, and since January of 2020 deep sea transportation rates have increased by 20.3 percent. Deep sea shipping rates also declined through most of 2020. In the case of rail transport, the rates have increased by 10.2 percent since March of 2021, and by 12.0 percent since January of 2020. Rail rates have been the most steady, although in absolute terms the rate of inflation has been lowest for inland water transportation.

There are two primary drivers for the recent increase in costs. Higher petroleum prices have led to an increase in diesel prices. Fuel surcharges have become standard for both rail and truck service. A shortage of truck drivers has increased the cost of truck transportation and has impacted the entire supply chain.

Unfortunately, there is a lack of hard data on actual shipping rates. Most price and amounts of products shipped are confidential (Boyer). Also, in there is some vertical integration in the industry, some elevators and grain marketing firms own their own trucks, rail cars, and charter ships. While this likely reduces the cost of shipping commodities actual cost and price figures are difficult to determine.

The State of Michigan’s Soybean Handling Facilities

Michigan has a total of 223 elevators, with a total capacity of 232,989,376 bushels. Some of these facilities focus on corn, or dry beans. This is particularly the case for facilities located adjacent to ethanol plants. Others such as the two Zeeland Farm Services facilities are used for their own products and processing. Herbruck’s also has elevators for its own feed system. However, there is potential for using existing capacity for efficient shipping of Michigan soybeans out of the state, especially to foreign markets. The counties with more than 10 million bushels of soybeans in capacity is shown in Table 1. A complete list of licensed grain dealers and capacity is shown in the appendix.

Table 1: Counties with more than 10,000,000 Bushels Capacity

County	Number of Elevators	Capacity (Bushels)
Huron	14	27,516,936
Saginaw	11	22,076,475
Gratiot	8	21,988,627
Lenawee	6	19,173,560
Tuscola	15	16,767,554
Eaton	7	12,659,360
Ottawa	6	10,433,500
Total	67	130,616,012

Source: Michigan Department of Agriculture and Rural Development

These counties account for 30 percent of all elevators and more than 56 percent of capacity. With the exception of Lenawee, Eaton, and Ottawa counties, these counties are located near the Saginaw Bay. This indicates that improvements to Saginaw Bay shipping and handling facilities could enhance the efficiency of the system, especially for expanding soybean exports to Europe, Africa, and the Middle East. Keeping the Saginaw River and Bay navigable not only improves the shipping of soybeans but of dry beans as well. It should be noted that many of the soybeans grown in this area currently go to the Zeeland crushing facility in Ithaca.

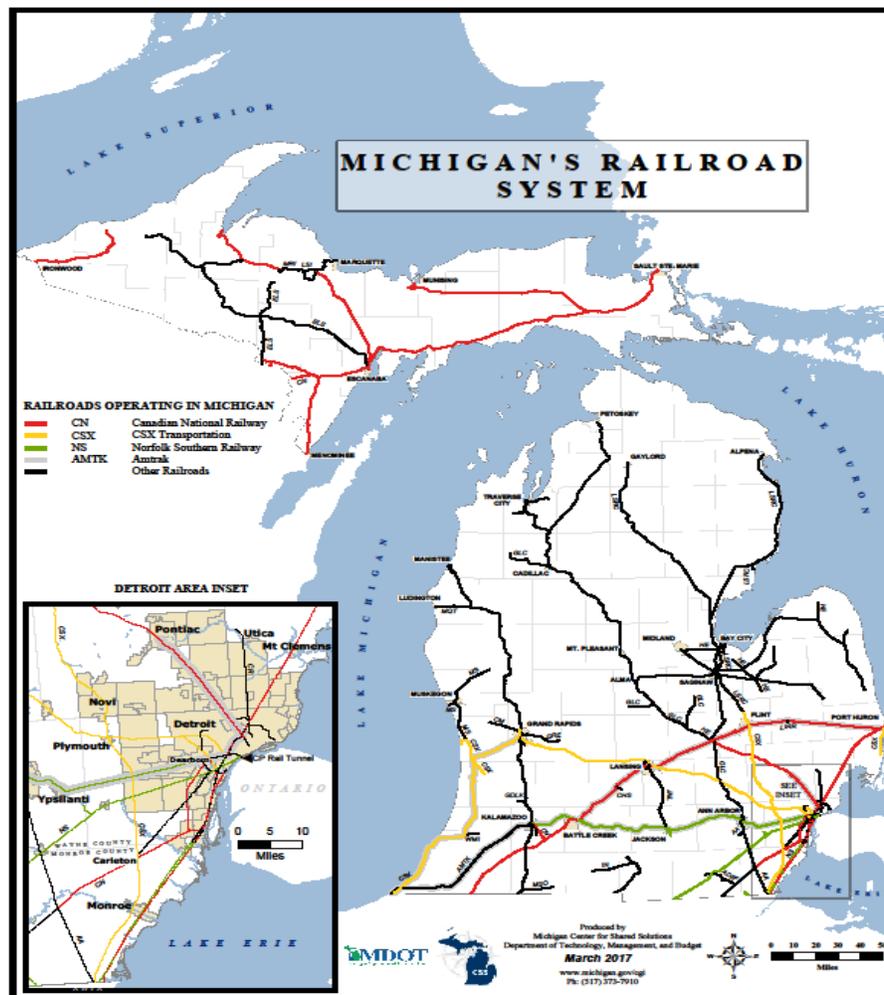
The war in Ukraine coupled with small but consistent increases in output has increased the demand for handling and storage infrastructure. This is despite the fact that steel prices have also increased (Reidy). High steel prices increase the cost of constructing storage and handling facilities. Increased soybean production as well as corn and wheat production will also increase the demand for storage. The increase may be greatest in Northern Michigan if climate change increases acreage in this part of the state. Climate change may also make double cropping wheat and soybeans feasible in the southern tier of counties which would also increase the need for grain and oilseed handling capacity.

The State of Michigan's Transportation Infrastructure

Rail Transportation

Michigan has approximately 3,600 miles of railroad track operated by 28 freight railroads (Michigan Department of Transportation). At one time Michigan had 9,000 miles of track. Three of the largest, or Class I railroads operate in the state. These are Canadian National, CSX, and Norfolk Southern. Overall rail accounts for 17 percent of the state's freight tonnage, and 21 percent of the state's commodities by value (Michigan Department of Transportation). Michigan's rail map is shown in figure 1.

Figure 1: Michigan's Railroad System



Source: Michigan Department of Transportation

It is important to note that except for the Canadian National tracks in the Upper Peninsula, the state is serviced by small, short line railroads from a line north of Grand Rapids to Flint. These lines link rural northern and Mid-Michigan to Class I lines. The class I lines, in turn, link Michigan to U.S. and international markets. Short line rail tends to be slower with a maximum speed of 25 miles per hour in some areas and are less efficient than the Class I railroads. Global supply chain disruptions have also made repairs of

machinery and track more difficult due to parts shortages. To address some of these issues the Fiscal Year 2022-2023 budget allocates \$135.9 million for capital and operating support for state rail programs (Herman).

Another issue is that some tracks cannot handle cars that weigh 285,000 pounds. This is the standard for agricultural commodities. The state also needs to increase transload capacity. Transloads would allow trucks filled with soybeans to transfer the soybeans to rail cars.

Another issue is that if the demand for coal declines as a result of a move to alternative energy the demand for rail service might decline even more. The railroads are trying to find alternatives for coal shipments. On the other hand, the new potash facility and increased grain production in the northern part of the lower peninsula could increase the demand for rail service. New and updated elevators located along these lines would also be helpful. Agriculture accounts for about one third of the traffic on short lines in the Northern Lower Peninsula (Tioga).

Much of the track is owned by the state. The state owns 353 miles or 97 percent of the Great Lakes Central, 105 miles or 36 percent of the Lake State Railroad Company, and 45 miles or 14 percent of the Huron and Eastern Railroad (Tioga). Most of the track in the North Central and Northeast Lower Peninsula are owned by the state. Many of the tracks in the thumb have to be routed through Saginaw instead of directly to the Canadian National line between Port Huron and Flint. As a result of these factors much of the soybeans grown in the state are trucked to Toledo (Tioga). Using Saginaw Bay as a point of shipping for soybeans seems to have some potential.

One of the biggest issues facing the industry is cycle times, the amount of time it takes to load and unload trains and cargo. The longer it takes to load and unload cars, the more cars are needed by railroads and shippers. This, plus the bottlenecks primarily at west coast ports also contributes to the shortage of containers. A major reason for longer cycle times is a labor shortage and lack of transload capacity. During the Covid outbreak railroads downsized and employment levels have not returned to their previous levels.

Figure 2 shows the CSX rail network. It is one the major railroads in the Eastern half of the United States.

Figure 2: CSX Rail Network



Source: CSX

CSX has 20,000 miles of track and services 70 ports. While not identified on this map some of the ports are St. Louis and Memphis on the Mississippi River and Montreal on the St. Lawrence. It is also a major shipper of feed to the Southeast, particularly Alabama, and North Carolina. Many Michigan soybeans are shipped to the southeast for poultry and hog feed.

Like CSX Norfolk Southern is also based primarily in the South and East. Its route map is shown in figure 3.

Figure 3: Norfolk Southern Route Map



Source: Norfolk Southern

While Norfolk Southern has fewer connections in the Northeast and limited access to Montreal. It does have connections that extend westward to Kansas City and Texas. As is the case with CSX it has access to the Port of Toledo, although its tracks in Michigan are limited to the Southeast part of the state. Both CSX and Norfolk Southern have terminals in Detroit. However, these terminals are not major handlers of agricultural commodities

Canadian National's routes are considerably different and perhaps reflect the export nature of many Canadian goods, particularly agricultural commodities. The map is shown in Figure 4.

Figure 4: Canadian National Route Map



Source: Canadian National

Canadian National has a large presence in Michigan, but not a large presence in the Northeast or Southeast. Tracks extend as far west as Omaha Nebraska. The lower Mississippi River region very well covered as well as ports in both Western and Eastern Canada. It appears that most of the soybeans that are shipped via Canadian National are destined for foreign markets, whereas many of the soybeans shipped via CSX and Norfolk Southern may be exported to the southeastern U.S.

One area of potential growth is the Detroit Intermodal Freight Terminal. While this terminal is geared toward the greater Detroit area and will likely be primarily utilized by the automobile industry, the terminal might have potential for soybean transportation to both the southeast U.S. as well as foreign markets. All the Class I railroads appear to use the facilities.

An issue facing the rail sector is the lack of rail cars, particularly shipping containers. This is an issue for both the short line and class I railroads. Many shipping containers are being shipped back to Asia empty due to bottlenecks at west coast ports. Access to shipping containers is especially important for food quality soybeans. Asia is the primary market for edible soybeans.

Despite these issues, there is enough rail capacity in the state to increase its shipping of soybeans. The Zeeland crushing plant in Ithaca has altered the supply chain in the state. While unit trains of 90 to 105 cars remain important, there is now a market for smaller trains to service the Ithaca facility. Also, while there is some seasonality in demand for shipping soybeans, highest in the fall during harvest; the demand for soybeans is year-round. This means that there is a need for storage that reflects this and the increased demand for soybeans in Michigan.

Truck Transport

Michigan has some competitive advantages relative to other states with respect to truck transport. The biggest advantage is that trucks in Michigan can weigh up to 164,000 pounds, the most in the country. A major issue facing truck transportation is the state of the roads. In 2019, it was estimated that it would cost \$2 billion a year to fix Michigan roads (Syracuse and Zin). The state has 122,000 miles of roads which is the ninth largest road network in the nation (Weiner et al).

There is a wide variance in the quality of the roads around the state. In 2017, 55.2 percent of the roads in Muskegon County were classified as being in good shape while in Ingham County 81.7 percent of the roads were classified as being in poor shape. Statewide, 47.9 percent of the roads were considered to be in poor shape.

As of 2021, 42 percent of the roads that received some federal supports were in fair condition, and 33 percent were in poor condition. Only 25 percent were in good condition. While these figures are concerning, the number of roads in good or fair condition increased, and the number of roads in poor conditions declined in 2021 (TAMC). There are more than 165,000 lane miles of non-federal aid roads in Michigan; 45 percent of these roads are classified as being in poor condition, and only 20 percent are in good condition (TAMC). This is an issue because many farmers use these roads to get their soybeans to the elevator.

The long-term forecast is troubling. It is estimated that by 2033, only 19 percent of federal support roads will be in good condition, 33 percent will be in fair condition and 48 percent will be in poor condition (TAMC). Increased repair and replacement costs play a role in this, as inflation reduces the number of miles that can be repaired given current gas taxes.

Bridges were in somewhat better shape with 33 percent rated in good condition and only seven percent rated in poor condition. However, four percent were rated in severe condition (TAMC). These bridges are in need of major repairs or replacement (TAMC). As is the case with roads, the forecast indicates that quality of bridges will decline in the future.

The Fiscal Year 2022-2023 budget allocates \$6 billion in funding for local roads, bridge repairs, and improving airport/transit systems (Herman). An additional \$645 million in federal funds were set aside this spring for roads, bridges, and other transportation projects (Oosting and House).

A major issue facing the trucking sector and the entire agri-food supply chains is a shortage of truckers. According to the American Trucking Association there was a shortage of 80,000 truck drivers, and 300,000 drivers leave the industry per year (Cerullo). In order to address this shortage, the trucking industry will have to raise wages and/or improve working conditions for drivers. This will increase the cost of trucking.

Trucking rates vary based on demand for trucks and the cost of operating trucks. A very rough estimate of current trucking rates in the Midwest is \$3.45 a mile (Method). Drivers generally make about 55 cents a mile, and diesel prices in the Midwest in June of 2022 were \$5.54 according to the Energy Information Administration. At 8 miles to the gallon the fuel cost per mile is about 69 cents a mile. Depreciation, administrative expenses, profit, and maintenance make up the bulk of the other factors that determine the price of trucking.

Many firms operate their own truck fleets which further makes the estimate of trucking costs difficult. In Michigan, Star of the West and Zeeland Farm Services are two major handlers and processors of farm commodities that operate their own truck fleets.

Marine Freight

Maritime freight is the least expensive method of transporting products. It is very well suited to bulk products such as agricultural commodities. Michigan has several deep-water ports. These are shown in Table 2.

Table 2: Michigan Ports

Port	County	Annual Tonnage	Major Cargoes Handled
Alpena	Alpena	2,237,000	Coal, coke, limestone, aluminum, salt, slag, cement
Calcite	Presque Isle	7,759,000	Gasoline, fuel oil, limestone, sand/gravel, salt
Cheboygan	Cheboygan	227,000	Gasoline, fuel oil, limestone
Detroit*	Wayne	14,836,000	Coal, limestone, iron ore, cement, iron & steel, aluminum, asphalt, slag
Drummond Island	Chippewa	1,260,000	Limestone, iron ore
Escanaba	Delta	84,000	Coal, salt
Gladstone	Delta	10,000	Asphalt
Grand Haven	Ottawa	1,321,000	Coal, limestone, sand/gravel, slag, cement
Holland	Ottawa	512,000	Limestone, sand/gravel, iron & steel
Ludington	Mason	473,000	Salt, limestone, sand/gravel
Manistee	Manistee	385,000	Coal, coke, limestone, slag
Marine City	St. Clair	780,000	Limestone
Marquette	Marquette	987,000	Limestone, sand/gravel, iron ore, clay
Marysville	St. Clair	385,000	Limestone, sand/gravel, iron & steel
Menominee/Marinette	Menominee	184,000	Salt, pig iron
Monroe	Monroe	1,195,000	Coal, limestone, asphalt, gypsum, iron & steel
Muskegon	Muskegon	773,000	Limestone, sand/gravel, clay, salt, cement
Port Dolomite	Mackinac	2,766,000	Limestone, sand/gravel, clay, salt, slag
Port Inland	Schoolcraft	4,327,000	Limestone, sand/gravel, clay, salt
Presque Isle and UP	Presque Isle	7,473,000	Coal, iron ore
Saginaw	Bay	3,214,000	Coal, Limestone, sand/gravel, salt, cement
Sault Ste. Marie	Chippewa	69,000	Salt, steel scrap
St. Clair	St. Clair	6,192,000	Coal
St. Joseph	Berrien	197,000	Limestone, cement
Stoneport	Presque Isle	4,141,000	Limestone, sand/gravel, clay, slag
Total Tonnage		61,787,000	
Detroit includes Detroit Harbor, Rouge River, Ecorse, and Trenton			

Source: The Great Lakes Seaway Partnership

The total tonnage is 61.79 million. None of the ports primarily handle agricultural commodities but there could be some potential. Ports that currently handle coal may be interested in alternatives as less and less coal is used for electricity production. Monroe, Detroit, and Muskegon are interested in new opportunities, which could include agricultural commodities.

The port of Saginaw is a particularly interesting case. It is located close to a major agricultural area. In addition to soybeans, the area is a major producer of corn, wheat, and dry beans. The Saginaw region is also comparatively well served by short line railroads. While there are no grain elevators at the port the region is has the most facilities and the largest capacity. It is also located far enough away from Toledo that it may not be in direct competition with that port. To be effective the Saginaw River needs to be dredged regularly. Dredging is primarily the responsibility of the U.S. Army Corps of Engineers.

Approximately 4,000 vessels cross the Soo locks annually. The total amount of cargo carried is 65 million tons. Agricultural commodities are a major component of the trade (Weiner et al). Michigan does not have a major agricultural port on the great lakes; much of the grain leaves ports in the Duluth area. However, this trade is based on the ability of the Soo locks to perform adequately. The key lock is 50 years old and could create a major supply chain bottleneck if the lock was out of commission.

To address some of these issues, the Michigan Legislature has passed two bills: Senate Bill 744 and House Bill 5291. Senate Bill 744 creates the Maritime and Port Facility Grant Program. Funds from the grant can be used to improve the environmental performance of a port (green marine certification), match federal funding opportunities, dredging waterways and harbors, repairing seawalls, and transitioning to cleaner technology. Of these activities, dredging is probably the most important, especially in the Saginaw Bay region.

Annual funding for the program is currently set at \$2.5 million. No more than 50 percent (\$1.25 million) can be allocated to one single applicant. The Maritime Port Facility Assistance Office within the Michigan Department of Transportation will administer the grant program. This office will also develop a statewide strategic maritime plan and identify federal funding opportunities to which owners of port facilities can apply. House Bill 5291 establishes this office.

Port of Monroe Compared to the Port of Toledo

One point to consider is the relative strength of the Port of Monroe to the Port of Toledo. The Port of Toledo is a major crop handling facility in the Eastern Corn Belt. The Port of Monroe primarily handles coal, limestone, synthetic gypsum, and liquid asphalt. It also handles project and break-bulk cargoes including natural gas pipelines, steel coils, and wind energy components. The port also has direct access to Norfolk Southern and Canadian National railroads. It is also located adjacent to I-75. While the port does not currently have grain handling facilities there is sufficient space to build an elevator (portofmonroe.com)

Located 21 miles south of the Port of Monroe is the Toledo/Lucas County Port Authority. There are several large grain handling facilities located at the port. ADM has a 9 million bushel facility that handles corn, wheat and soybeans. The ADM facility is serviced by CSX railroad. Mondelez has a 5 million bushel facility that focuses on servicing its flour mill. This facility is serviced by Norfolk Southern. Cargill has a 5.9 million bushel facility that is serviced by Norfolk Southern; the facility is managed by the Anderson's. The Anderson's also has their own 7 million bushel facility that is also served by Norfolk Southern. Total

capacity is 26.9 million bushels at the Toledo Port Authority including the Mondelez facility; capacity is 21.9 million bushels excluding the Mondelez facility.

The Great Lakes Shipping season generally runs from late March through the middle of December when the ice sets in and the Soo Locks and Welland Canal close. While shipping is closed ships are repaired and are made ready for the new shipping season.

While there is potential to develop the Port of Monroe to expand grain handling capacity, it appears that unless the level of grain and soybean production in the region increases there will not be a demand for grain handling in Monroe. The fact that the port is only 21 miles from the Toledo facility also reduces the likelihood that the Port of Monroe will expand. Overall, Saginaw Bay has more potential.

Soybeans that go through the Toledo Port Authority generally are either exported to foreign countries or are shipped to the Southeast. Particularly large domestic markets appear to be Alabama and North Carolina. Alabama is a major poultry producing state and North Carolina is a major pork producer. All the railroads that service the port have access to ports on the Mississippi.

Summary

Michigan is dependent on exports out of the state in order to maintain a robust soybean industry. Storage and handling, as well as transportation are critical nodes of infrastructure. Most of the field crop storage and handling facilities are located near major agricultural production areas, the Thumb and Saginaw Bay region have the most elevator capacity. Obtaining good estimates for costs of transportation is difficult. Rates are generally not published and in the case of truck transport many soybean handlers operate their own fleets.

Soybeans are shipped out of Michigan via truck, rail, and ship. The primary shipping point appears to be the Port of Toledo. Shipping soybeans via the Port of Saginaw appears to have potential. It is located some distance from the Port of Toledo, has access to rail service and is located near some major elevators. Water transport is the most cost-effective way to transport soybeans and is important to transport soybeans across the Atlantic ocean.

Rail service north of a line between Grand Rapids and Flint is dependent on short line firms whose track is often owned by the state. In some cases, especially in the thumb region, connection to the Class I railroads is difficult. Effective rail transport in the Northern Lower Peninsula may become more important has more soybeans are grown in that part of the state. Good rail transport is important to move soybeans to ports and to the Southeast U.S. where soybeans grown in Michigan are used to feed poultry and hogs.

Truck transport is the most expensive form of transportation on a per mile basis. Michigan does have a competitive advantage in that trucks are allowed to have a maximum weight of 164,000 pounds, the highest in the country.

As a result of additional federal funding and state support, the Fiscal Year 2023 Michigan Budget has set aside funding for several transportation projects. The 2022-2023 budget includes several efforts to enhance the efficiency of the Michigan agri-food system. The Department of Agriculture and Rural Development budget includes \$50 million in one-time spending for economic development. Funding for this program is to be used for a grant program that will support community activities including broadband, housing infrastructure, education, workforce development, and other needs. The budget also includes

\$2.47 million for the Food and Agriculture Investment Program. Funds in this program can be used for grants, loans or loan guarantees, infrastructure development, and export assistance. The Fiscal Year 2022-2023 budget allocates \$135.9 million for capital and operating support for state rail programs (Herman). An additional \$6 billion is allocated in funding for local roads, bridge repairs, and improving airport/transit systems (Herman). An additional \$645 million in federal funds were set aside this spring for roads, bridges, and other transportation projects (Oosting and House).

To improve water freight the Michigan Legislature has passed two bills: Senate Bill 744 and House Bill 5291. Senate Bill 744 creates the Maritime and Port Facility Grant Program. Funds from the grant can be used to improve the environmental performance of a port (green marine certification), match federal funding opportunities, dredging waterways and harbors, repairing seawalls, and transitioning to cleaner technology. Of these activities, dredging is probably the most important, especially in the Saginaw Bay region. Annual funding for the program is currently set at \$2.5 million. No more than 50 percent (\$1.25 million) can be allocated to one single applicant.

While these are large investments they may not be sufficient to offset further declines in the quality of transportation infrastructure (Oosting and House). High rates of inflation have increased the price of inputs used for roads and bridges which reduces the amount mileage that can be repaired.

The U.S. and Canada are both mature economies. Many soybeans grown in Michigan are shipped to the Southeast U.S. and Canada. Improved infrastructure would improve the efficiency of the Michigan soybean sector and perhaps increase access to growing foreign markets, especially in the Mideast and Africa. It is important that the investments in infrastructure consider the needs for the Michigan agri-food sector.

Appendix: Licensed Grain Dealers in Michigan

County	Licensee	Total Capacity (in bushels)
Allegan	Endeavor Ag & Energy LLP	1,200,000
Allegan	Moline Co-Op	435,000
Allegan	Peaceful Road Farm Products dba Hopkins Elevator	420,000
Antrim	Ellsworth Farmers Exchange	190,000
Arenac	Standish Milling Co. Inc.	87,500
Arenac	The Andersons Inc. - Standish	3,337,000
Arenac	Turner Bean & Grain Inc.	54,000
Barry	Caledonia Farmers Elevator Company #1	111,700
Barry	Carbon Green Bioenergy	1,800,000
Barry	Carbon Green Bioenergy LLC	2,275,000
Bay	ADM Edible Bean Specialties - Auburn	469,000
Bay	ADM Edible Bean Specialties - Pinconning	80,000
Bay	Everbest Organics, Inc. - Munger	813,972
Bay	Gavilon Grain, LLC Bay City	1,303,000
Bay	Ittner Bean & Grain, Inc.	1,385,000
Bay	Michigan Bean Company - Munger	80,000
Bay	The Andersons Inc. - Auburn East	2,310,000
Bay	The Andersons Inc. - Auburn West	1,073,000
Branch	Star of the West - Quincy	998,201
Calhoun	Hoffman Ag Service	685,000
Calhoun	Star of the West - Battle Creek	675,000
Calhoun	The Andersons, Inc. - Albion Grain Division	3,821,000
Calhoun	Voyce's Elevator Inc.	200,000
Cass	Community Mills Inc. 1	515,000
Cass	Community Mills Inc. 2	394,000
Cass	Mennel Milling Company of Michigan	865,000
Clinton	Matthews Elevator	350,000
Clinton	Ovid Elevator Co.	210,864
Clinton	Westphalia Milling Co.	300,000
Delta	Rays Feed Mill,, Inc.	450,000
Eaton	ADM Grain Co. - Grand Ledge	7,446,000
Eaton	Caledonia Farmers Elevator Company #4	1,900,000
Eaton	MAC - Lansing	0
Eaton	Purina Animal Nutrition LLC	26,360
Eaton	Star of the West - Charlotte	1,077,000
Eaton	Star of the West - Otto	367,000
Eaton	Star of the West - Potterville	844,000
Eaton	Star of the West - Vermontville	999,000
Gratiot	Hirschman Grain, LLC	500,000
Gratiot	Kalmbach Feeds of Michigan, LLC	850,000
Gratiot	MAC - Breckenridge	3,089,000
Gratiot	MAC - Middleton	5,300,000
Gratiot	MAC - Wheeler	6,000,000
Gratiot	MHC Marketing	1,025,000
Gratiot	Mid-Michigan Specialty Crops	274,627

Gratiot	ZFS Ithaca LLC	4,950,000
Hillsdale	Commodity Blenders, LLC	325,000
Hillsdale	Litchfield Grain Company, Inc.	420,000
Hillsdale	Prattville Fertilizer & Grain, Inc.	270,000
Hillsdale	Star of the West - Squires	532,892
Hillsdale	The Andersons, Inc. - Reading	4,531,000
Hillsdale	Waldron Grain & Fuel Co.	1,527,000
Hillsdale	Waldron Grain & Fuel, Co. dba Coman Road Elevator	1,938,000
Huron	Active Feed Co.	130,000
Huron	ADM Edible Bean Specialties - Kinde	118,000
Huron	ADM Edible Bean Specialties - Ubly	1,833,000
Huron	Bayside Best Beans LLC	1,390,833
Huron	Cooperative Elevator Co.	3,725,000
Huron	Cooperative Elevator Co. - 2	730,000
Huron	Cooperative Elevator Co. - 3	6,040,000
Huron	Cooperative Elevator Co. - 8	860,000
Huron	Cooperative Elevator Co. - 3	5,410,000
Huron	Farmers Cooperative Grain Co. - Elkton	100,000
Huron	Farmers Cooperative Grain Co. - Kinde	3,000,000
Huron	Hensall District Coop	Not Reported
Huron	Star of the West - Rapson	3,260,103
Huron	Vita Plus Corporation - Owendale	920,000
Ingham	ADM Grain Co. - Webberville	6,385,000
Ingham	Caledonia Farmers Elevator - Leslie	350,000
Ingham	Jorgensen Farm Elevator	1,750,000
Ingham	Webberville Feed and Grain Co.	31,000
Ionia	ADM Animal Nutrition	7,400
Ionia	Caledonia Farmers Elevator Company #2	380,000
Ionia	Herbruck Poultry Rand IN dba Great Lakes Milling	1,000,000
Ionia	Herbruck Poultry Ranch Inc.	330,000
Ionia	J&J Gallagher Farm Services	300,000
Ionia	Musgrove Grain LLC - Lake Odessa	2,000,000
Ionia	Walcott Elevator dba Ionia Grain	925,000
Iosco	Gingerich Feed & Implements Inc.	95,000
Isabella	Blanchard Bean Company	90,000
Isabella	Johnston Elevator	42,577
Isabella	Star of the West - Delwin	310,000
Isabella	Star of the West - Rosebush	900,000
Isabella	Star of the West - Shepherd	1,700,000
Jackson	Commodity Exchange, Inc.	300,000
Jackson	Napoleon Feed Mill, Inc.	100,000

Jackson	Springport Elevator	38,000
Kalamazoo	Battle Creek Farm Bureau	320,000
Kalamazoo	H&H Feed and Grain, Inc.	360,000
Kalamazoo	Knappen Milling Co.	2,043,000
Kent	Caledonia Farmers Elevator Company #3	185,000
Kent	Kent Milling Co. Inc.	3,600,000
Kent	Musgrove Grain LLC - Heinbeck	350,000
Lapeer	Cooperative Elevator Co. - 9	1,070,000
Lenawee	ADM Grain Co - Ottawa Lake	11,823,000
Lenawee	John Marion Inc. - Britton	1,786,000
Lenawee	MAC - Blissfield	3,890,000
Lenawee	MAC - Jasper	850,000
Lenawee	Penn Acres Grain, Inc.	207,560
Lenawee	Purity Foods Inc.	617,000
Livingston	Fowlerville Feed & Pet Supplies	11,233
Macomb	Armada Grain Co. - Armada	20,000
Macomb	Star of the West - Richmond	289,880
Mason	Acres Cooperative Inc.	1,030,000
Mecosta	Big Rapids Farm and Garden Supply Inc.	80,000
Mecosta	Ravenna Feed & Grain dba Countryline Grain	650,000
Menominee	Stephenson Marketing Cooperative Inc.	181,000
Midland	GLGT Freeland	172,500
Midland	Ittner Bean & Grain, Inc. - E.R. Simons	400,000
Missaukee	Ceres Solutions Cooperative	670,000
Missaukee	McBain Grain Co.	102,074
Monroe	Ida Farmers Co-Operative Co.	1,161,435
Monroe	John Marion Inc. - Dundee	967,000
Monroe	Masserant's Feed & Grain	70,000
Monroe	Maybee Farmers Co-Op Inc.	260,000
Monroe	Ottawa Lake Co-Op Elevator	950,000
Montcalm	Country Ridge Bean Inc.	147,000
Montcalm	Harvey Milling Co. Inc.	64,000
Montcalm	Sietsema Farms Feeds	1,100,000
Montcalm	West Michigan Bean Co.	150,000
Muskegon	Ravenna Feed & Grain	400,000
Newaygo	Ceres Solutions Cooperative	1,432,000
Newaygo	Ceres Solutions, Inc.	1,252,000
Newaygo	MAC - Newaygo	3,300,000
Oceana	Tri County Feed Service	200,000
Ottawa	Endeavor Ag & Energy LLP	5,000,000
Ottawa	Farmers Cooperative Elevator dba Vriesland Mill	780,000
Ottawa	Groeninks Elevator & Hardware Inc.	67,000
Ottawa	John A Vandenbosch Co.	76,500
Ottawa	Walcott Elevator	10,000
Ottawa	Zeeland Farm Services Inc.	4,500,000

Saginaw	Ackerman Marketing Inc.	Not Reported
Saginaw	ADM Edible Bean Specialties - Reese	685,000
Saginaw	ADM Edible Bean Specialties - Saginaw	710,000
Saginaw	Freeland Bean & Grain Inc.	700,000
Saginaw	Gavilon Grain, LLC Carrollton	3,153,000
Saginaw	Gavilon Grain, LLC Saginaw	2,451,000
Saginaw	GLGT - Saginaw	400
Saginaw	Star of the West -Gera	2,840,724
Saginaw	Star of the West Milling Co.	425,000
Saginaw	The Andersons Inc. - Hemlock	4,750,000
Saginaw	The Andersons Inc. - Oakley Corn Plant	4,297,757
Saginaw	The Andersons Inc. - Oakley Town Plant	2,063,594
Saint Clair	Armada Grain Co. - Capac	20,000
Saint Clair	Marysville Ethanol LLC	500,000
Saint Clair	Star of the West - Emmett	1,994,000
Saint Clair	Star of the West - Jeddo	1,404,636
Saint Clair	Stop Loss Trading LLC	Not Reported
Saint Clair	Vogelsberg Grain Company	400,000
Saint		
Joseph	The Andersons Inc. - White Pigeon Terminal	5,386,000
Sanilac	ADM Grain Co. - Snover	799,000
Sanilac	Brown City Elevator Inc.	76,000
Sanilac	Cooperative Elevator Co. - 5	75,000
Sanilac	MAC Brown City	3,625,000
Sanilac	MAC Marlette	4,010,000
Shiawassee	Durand Feed & Grain	89,500
Shiawassee	Harvest Mills Inc.	400,000
Shiawassee	Henderson Grain Co.	550,000
Shiawassee	Morning Star Grain LLC	460,000
Tuscola	Cooperative Elevator Co - 6	2,690,000
Tuscola	Cooperative Elevator Co. - 7	170,000
Tuscola	Everbest Organics, Inc. - Fairgrove	140,000
Tuscola	Harrington Seeds Inc.	10,000
Tuscola	Michigan Bean Company - Akron	50,000
Tuscola	Millington Elevator and Supply Co. Inc.	290,000
Tuscola	Poet Grain LLC	4,831,000
Tuscola	Quality Roasting LLC	300,000
Tuscola	Star of the West - Cass City	1,158,657
Tuscola	Star of the West - Fairgrove	554,701
Tuscola	Star of the West - Gilford	1,420,487
Tuscola	Star of the West - Reese	673,167
Tuscola	Star of the West - Richville	2,639,542
Tuscola	Vita Plus Corporation - Gagetown	920,000
Tuscola	Vita Plus Corporation - Unionville	920,000
Van Buren	Cargill Incorporated	4,423,000

Washtenaw	Chelsea Milling Company	1,028,000
Washtenaw	John Marion Inc. - Saline	679,000
Wayne	Pandora Grain and Supply	Not Reported
Total		232,989,376

References

- Boyer, K. D. (1997). *Principles of Transportation Economics*, Addison Westley Longman.
- Cerullo, M. (2022). "Low pay, grueling work fuels trucker shortage," *CBS News*, April 5, 2022.
- Herman, J. (2022). "\$76 B budget heads to Whitmer with a focus on education, infrastructure," *MLive*, July 1, 2022.
- Method (2022). *Trucking Rates per Mile 2002*.
- Michigan Asset Transportation Management Council (2022), (TAMC). *Michigan's 2021 Roads & Bridges Annual Report*.
- Michigan Department of Transportation. <https://michigan.gov/mdot/travel/mobility/rail>
- Oosting, J., and K. House (2022). "Michigan is spending big on infrastructure. Its problems are even bigger," March 28, 2022.
- Port of Monroe. <http://portofmonroe.com/out-port/>
- Reidy, S. (2022). "Grain Storage and Handling Projects," *World Grain*, June 2022, June 2022 (40-46).
- Siracuse, M. and D. Zin (2019). *State Notes: The Rising Costs of Road Repair*, Senate Fiscal Agency.
- TCI Capital (2022), (TCI). *Current Freight Rates – May 2022*.
- Tioga (2014). *The role of rail infrastructure in the economic development of Michigan's Northern Lower Peninsula*.
- U.S. Department of Transportation (2022). *National Transportation Statistics 2021*.
- Weiner et al (2016). *21st Century Infrastructure Commission Report*.
- World Population Review (2022). *Truck Axle Weight Limits by State 2022*.