

Freight Primer: An Introduction to Freight Modes in Michigan



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Freight Primer: An Introduction to Freight Modes in Michigan

An efficient and well-maintained transportation system serves as the backbone for all economic activity. Efficient transportation systems move goods and people throughout local, regional, state, national and international economies in a safe, timely, and reliable manner. The freight transportation system of Michigan is an important element of economic competitiveness, especially as the state continues to expand its role as a major domestic and global trade partner.

Freight is defined as any good, product, or raw material carried by a commercial means of transportation – including air, highway, rail, water, and pipeline. The activities involved in the management of how and where freight moves are defined as logistics. This is becoming a significant challenge due to the growing need for freight services resulting from increased consumer demand, congestion, and the ability of the transportation infrastructure to support such demand. In light of existing market forces, rising fuel prices, and other factors that will increase the cost of moving goods, freight planning is an important component of the statewide and metropolitan planning process.

The following summary provides an overview and description of freight modes of transportation found in Michigan, including definitions and terminology that are commonly used in the freight industry. This is not meant to be an exhaustive list, but one tailored to Michigan from a statewide and multi-modal perspective.



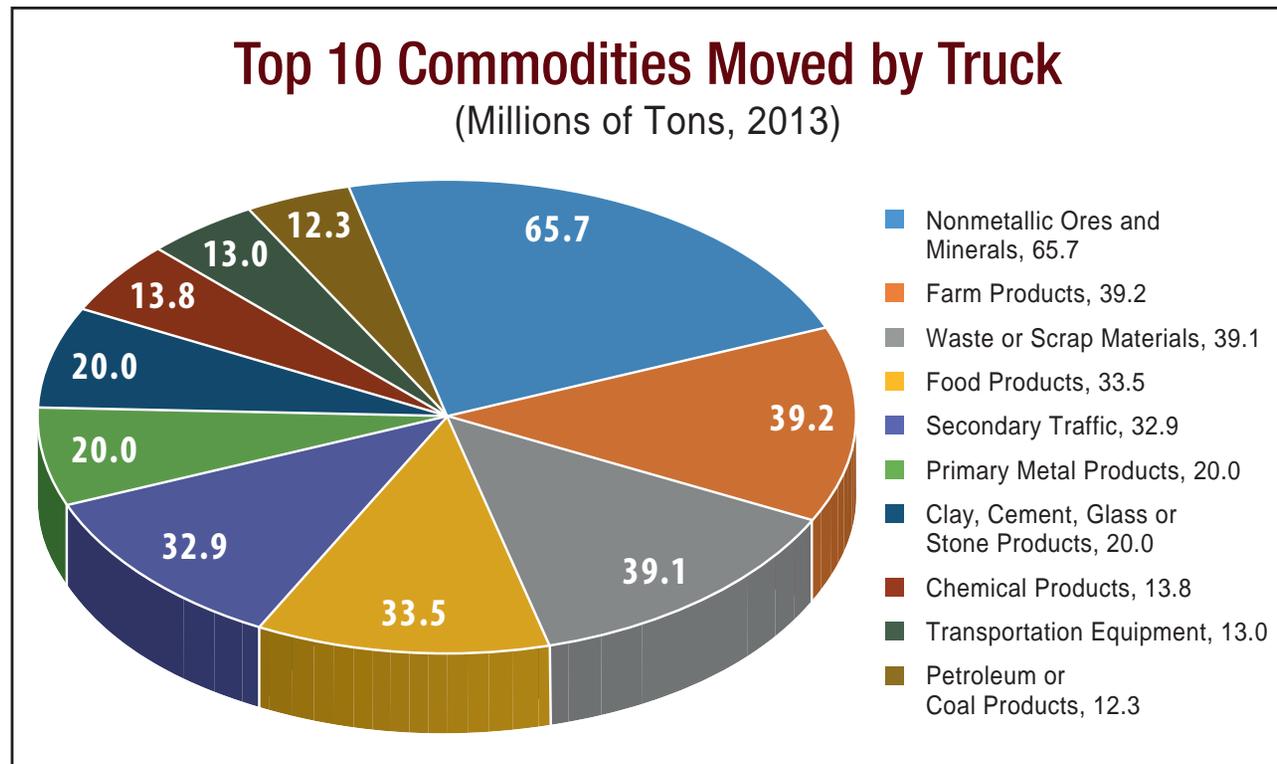
Mode by Mode Overview

The following information includes a brief overview of each mode, the major commodities handled, their share of the total tonnage traveling into, out of, within, and through Michigan, as well as a few facts and figures. Data included is from 2013 or 2014, which is the most recent data available.

Trucking in Michigan

Carrying more than half of the total freight in Michigan, the trucking industry is a large and complex component of the state's total transportation system and a major contributor to economic activity. In 2013, 338.1 million tons of freight were moved by truck, accounting for 67 percent of the tonnage moved in the state. The value of freight moved by truck was \$563.6 billion, accounting for 74 percent of all traffic. Nearly every consumer product is moved by truck at one point en route to the end user. Trucks are a necessary element of all industrial sectors – especially Michigan's manufacturing, agriculture, wholesale, retail,

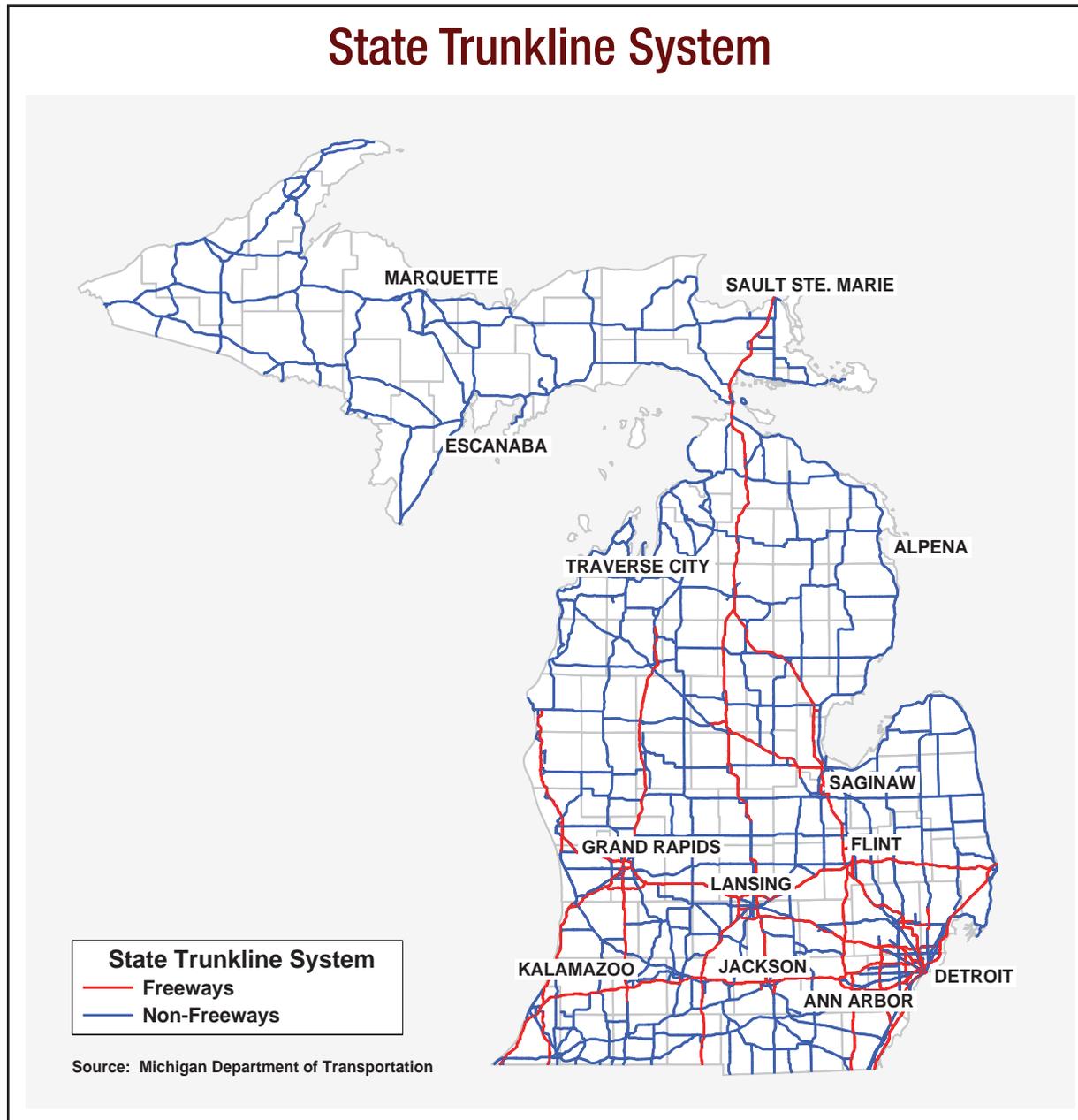
and construction industries. Michigan's economy continues to move forward with noticeable contributions from the commercial trucking industry. The top 10 commodities moved by truck are indicated in the chart below, and account for approximately 85 percent of the total tonnage handled in the state.



Source: IHS Transearch Database

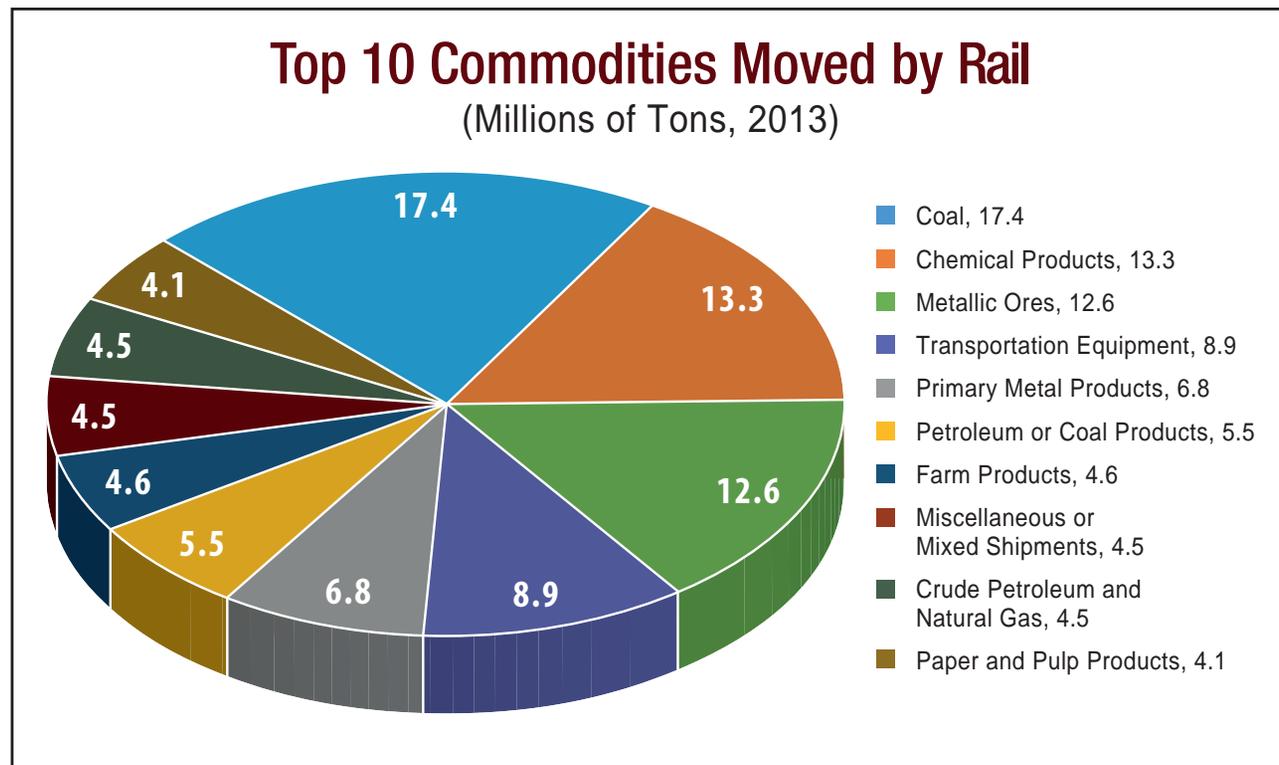
Michigan law allows for heavier overall truck weights than most other states, where the maximum gross vehicle weight adheres to the federal standard of 80,000 pounds. In Michigan, the maximum gross vehicle weight is more than double at 164,000 pounds and remains so due to a grandfather clause. This may seem to have a direct connection to the condition of Michigan roadways, but research has found that pavement damage is directly related to axle load, not gross vehicle weight. To ensure that Michigan's higher gross vehicle weight inflicts the least possible damage to roadways, the weight-per-axle guidelines require additional axles as gross vehicle weight increases, with most trucks carrying between 13,000 and 16,000 pounds per axle, which is less than the average of 17,000 to 20,000 pounds per axle under the federal 80,000 pound gross vehicle weight standard.

State Trunkline System



Michigan's Rail System

The freight railroad industry is almost exclusively privately owned and financed, with railroad companies owning and maintaining a vast majority of the track infrastructure throughout the state. The State of Michigan owns and maintains 665 miles of track throughout the state that were saved from abandonment, and is involved in an ongoing process of divestiture to return commercially viable rail operations to the private sector as market conditions allow. In 2013, 100.4 million tons of freight were moved by rail, accounting for 20 percent of the tonnage moved in the state. The value of freight moved by rail was \$160.9 billion, accounting for 21 percent of all traffic. Rail is a cost-effective alternative for heavy and bulk commodities, and is commonly the preferred transport method for hazardous materials. Intermodal rail is growing rapidly within the railroad industry. Container movement between truck and rail offer efficiencies in long-distance freight movements and overseas trade. In 2013, intermodal shipments reached 15.5 million and reached a new high at 4.6 percent above the previous record set for both Canadian and U.S. railroads for domestic and international movements.



Source: STB Waybill and MDOT Statistics

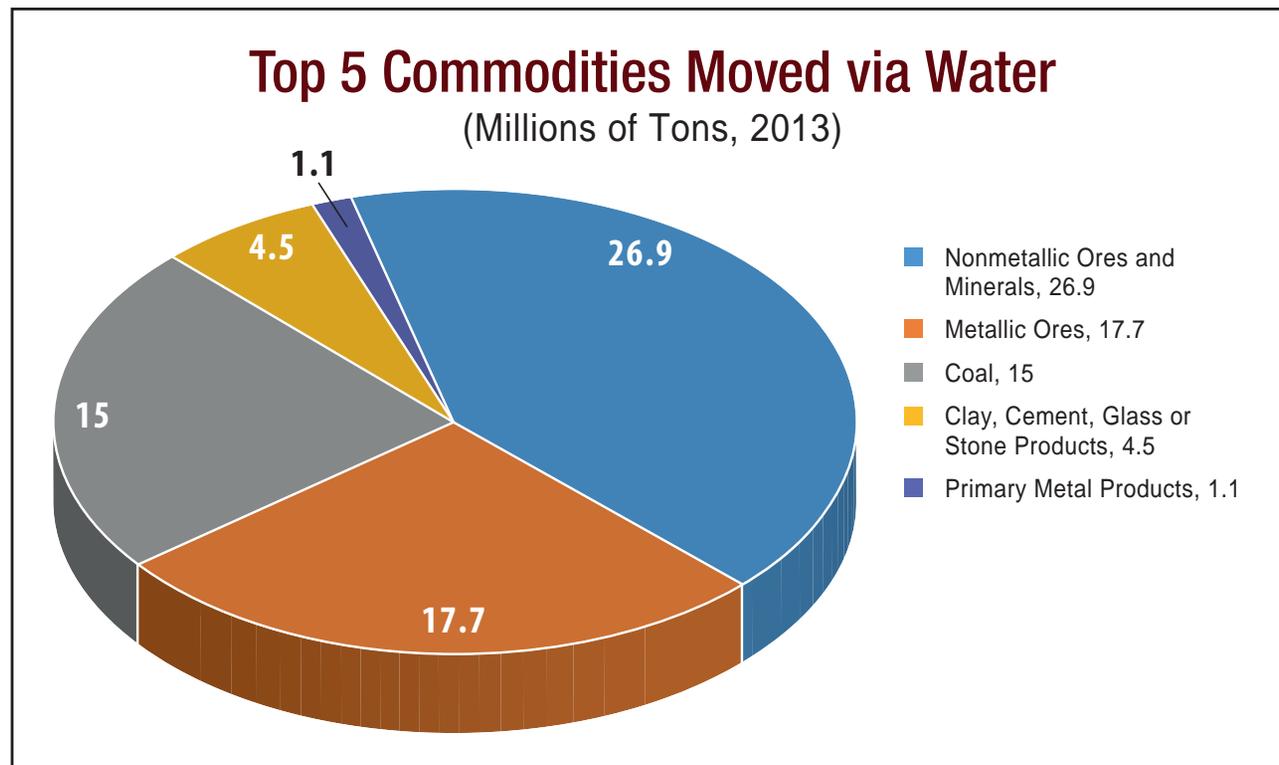
Michigan Railroad System



Marine Transportation

The Great Lakes and St. Lawrence Seaway form a maritime transportation system extending 2,300 miles from the gulf of the St. Lawrence on the Atlantic Ocean to the western end of Lake Superior. Michigan's shoreline contains approximately 40 active cargo ports that ship or receive freight cargoes.

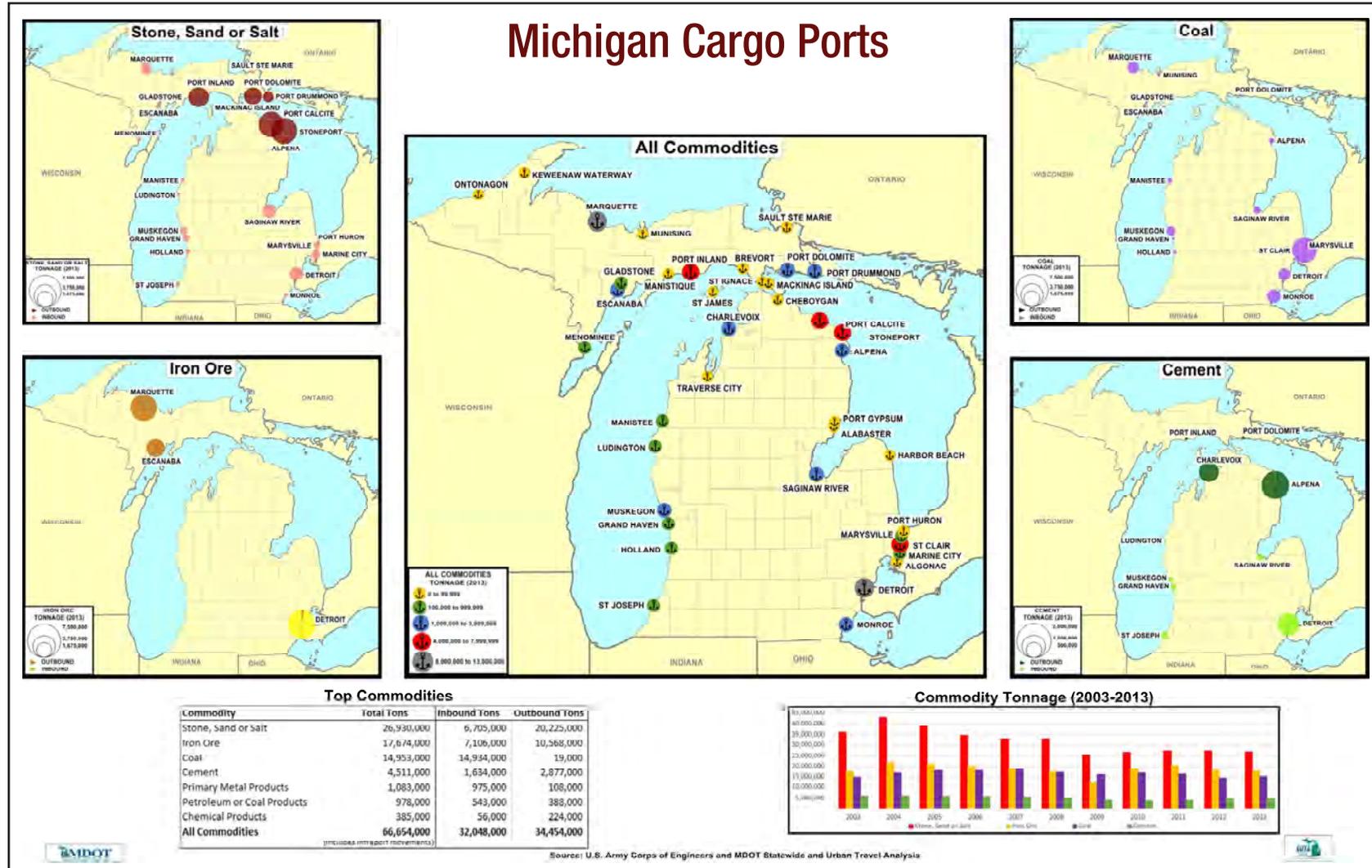
Since the opening of the St. Lawrence Seaway in 1959, Michigan's total annual waterborne commerce has ranged from 53 to 114 million tons. The mean annual tonnage during this period is 93 million. In recent years, the volumes have been approximately 70 million tons, which is nearly half the total generated by U.S. Great Lakes ports. In 2013, 66.7 million tons of freight were moved by water, accounting for 13 percent of the tonnage moved in the state. The value of freight moved by water was \$5.2 billion, accounting for 1 percent of all traffic. Most of Michigan's waterborne traffic is generated by the steel and construction industries and is therefore susceptible to variations in the general economy and government policies regarding steel production and importation.



Source: U.S. Army Corps of Engineers and MDOT Statistics

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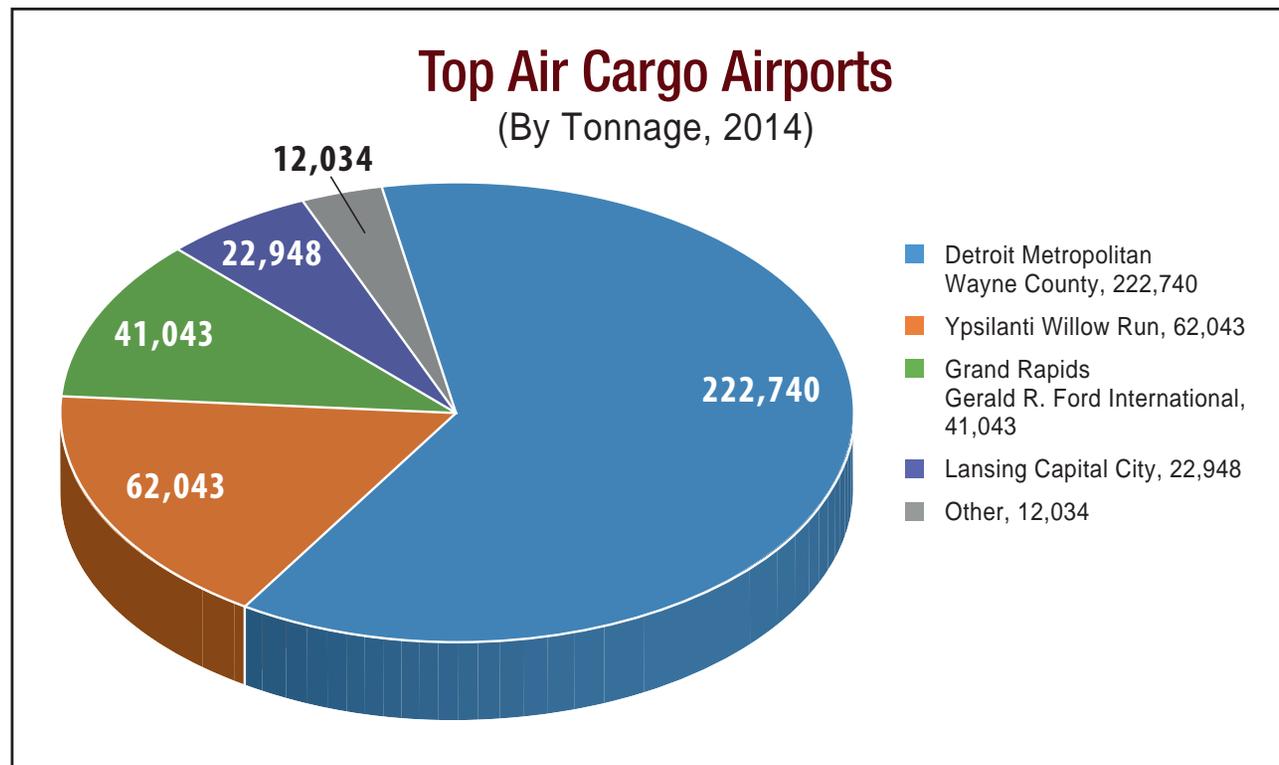
Ship owners seek to maximize vessel size within the constraints of the navigation system in order to maximize the efficiency of their operations. In the Great Lakes-St. Lawrence Seaway System, lock infrastructure provides a specific constraint: St. Lawrence Seaway locks measure 233.5 meters (766 feet) long by 24 meters (80 feet) wide by 9.14 meters (30 feet) deep. Therefore, many vessels have been constructed to “Seawaymax” dimensions. These vessels measure 226 meters (740 feet) in length and 24 meters (78 feet) in width and have a draft of 7.92 meters (26.5 feet).



Air Freight

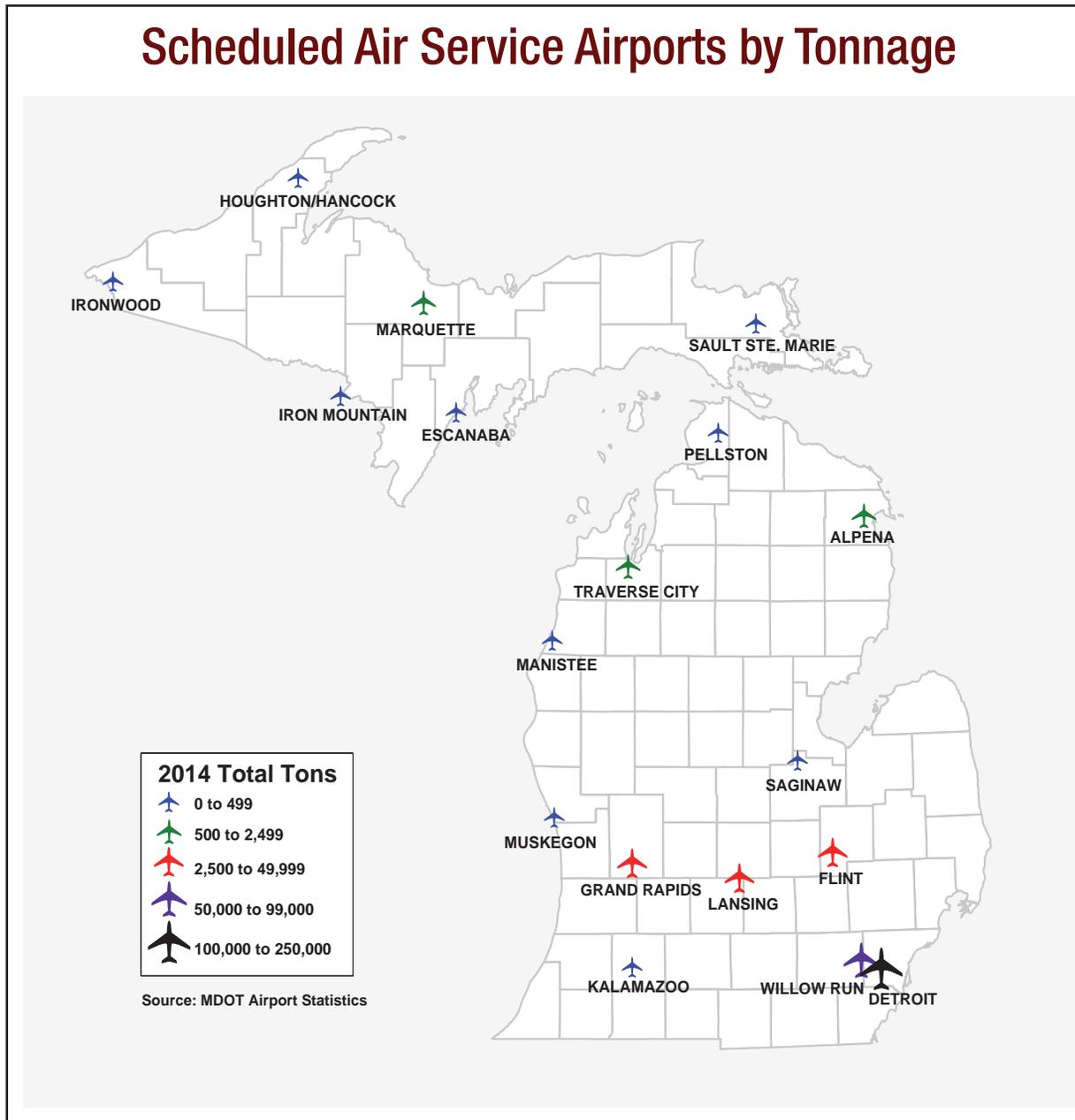
Air transport is essential to managing and controlling the flow of resources like products, services, and people from the source of production to the marketplace. Although it makes up a small percentage of the total tonnage moved, air freight is undeniably important to the global transportation network. Air cargo services are particularly important for high-value and time-sensitive commodities. In Michigan, the major products that move by air are small package freight, chemical products and automotive parts.

In 2014, 360,808 tons of freight were moved by air. The value of freight moved by air was \$31.4 billion, accounting for 4 percent of all traffic. On an annual basis, households, businesses, and governments spend about \$7 billion on aviation and aviation-related services. A total of 18 airports offer scheduled services that handle air cargo throughout the state. Local airports continue to serve as strong economic engines for local communities by providing service to airport-dependent businesses to connect to the global marketplace in the quickest way possible.



Source: MDOT Airport Statistics

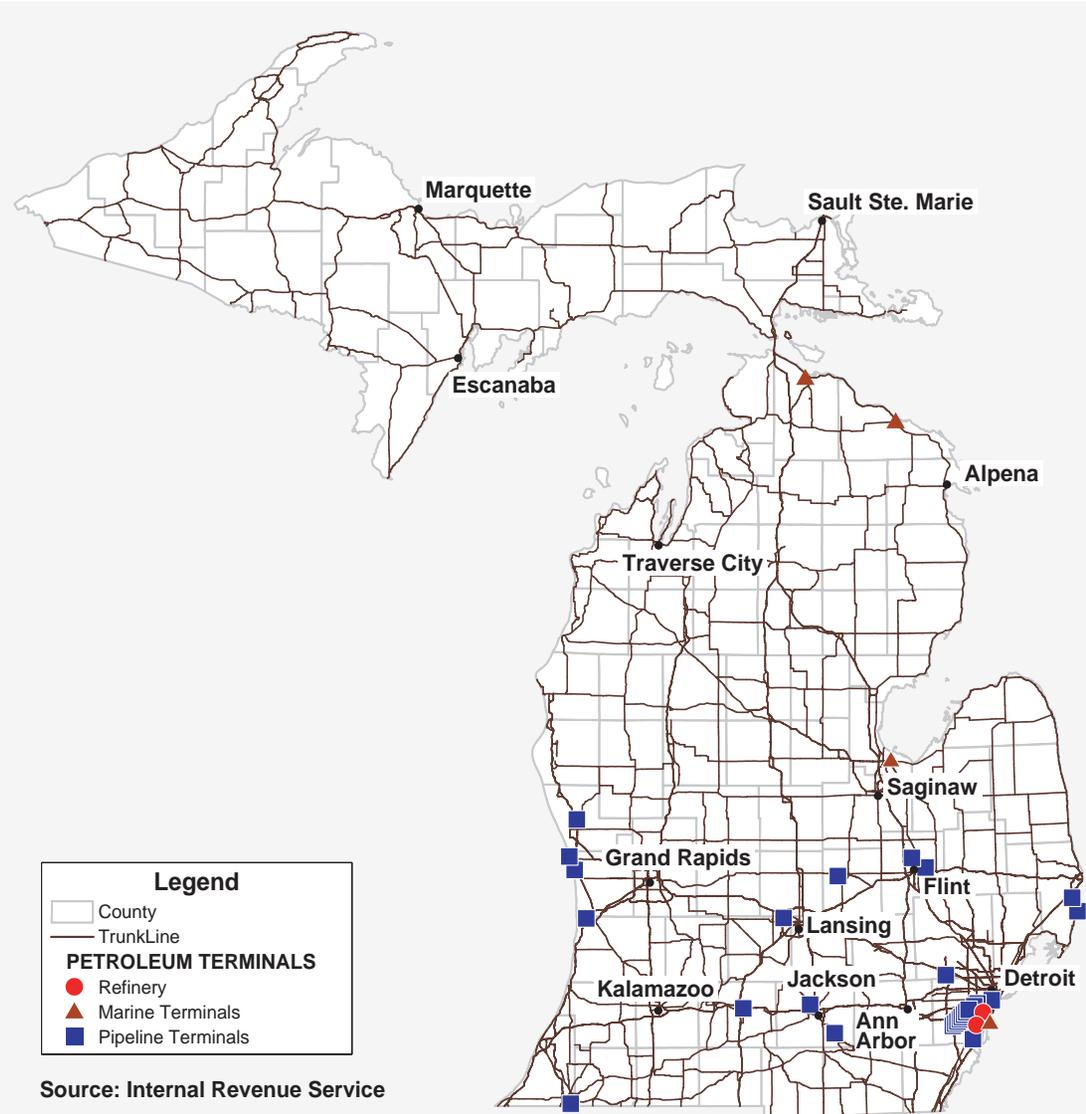
Scheduled Air Service Airports by Tonnage



Pipelines

The pipeline infrastructure network is extensive, and includes natural gas and petroleum pipelines throughout the state, connecting Michigan to the rest of the nation and nearby countries. Although MDOT does not oversee pipeline infrastructure, it maintains a list of petroleum pipeline terminals in the state. These sites are major generators of petroleum movements, and keeping updated information benefits the department's freight modeling efforts by allowing for the simulation of origin/destination patterns on state highway infrastructure. The following map shows pipeline terminal locations.

Petroleum Terminals and Refineries in Michigan



Public versus Private Infrastructure

The decisions about which mode to use are made by the private sector companies that are handling the freight, but the infrastructure on which they travel can be public, private, or a combination of the two as illustrated in the case of marine infrastructure, where the waterways are public and the marine terminals are privately owned. Coordination between the public and private sectors is essential to ensuring optimal productivity and economic activity. Below is a chart summarizing the modes and infrastructure ownership.

Mode	Infrastructure	Freight Service
Highway	Public	Private
Rail	Public and Private	Private
Marine	Public and Private	Private
Air	Public	Private
Pipeline	Private	Private

FREIGHT DEFINITIONS AND TERMINOLOGY

The following definitions and terminology are focused on freight modes operating in Michigan and are taken from official freight publications from across the nation, including the Freight-Rail Bottom Line Report, Transportation Research Board circulars, Dredging and the Great Lakes by the Great Lakes Dredging Team, the online Freight Glossary and Acronyms index provided by FHWA Freight Management and Operations, as well as internal documentation.

This list is by no means exhaustive, but reflects many of the common freight-related terms used throughout the state of Michigan.

General Terminology

Backhaul	The process of returning from the original destination point to the point of origin.	
Bottleneck	<p>A section of infrastructure that experiences operational problems such as congestion.</p> <p><i>Source: MDOT Photography Unit</i></p>	
Breakbulk Cargo	Cargo of non-uniform sizes, often transported on pallets, stacks, drums or bags. Labor-intensive loading and unloading required. Examples include coffee beans, logs, and wood pulp.	
Bulk Cargo	Cargo that is in a loose unpackaged form. Examples include coal, grain, and petroleum products.	
Carrier	A company that transports goods or people via land, sea, or air.	
Commodity	<p>An item that is traded in commerce. Michigan's major commodities by tonnage are:</p> <ul style="list-style-type: none"> • Rail (coal, chemical products, metallic ores, transportation equipment), • Marine (nonmetallic minerals, coal, metallic ores, clay/concrete/glass/stone), • Truck (nonmetallic ores, farm products, food products, chemical products). 	
Consignee	The receiver of a shipment.	

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<p>Container</p>	<p>A sealed metal box, generally measuring 8 feet (2.4 meters) in height, and with lengths varying from 20 feet to 45 feet (6 meters to 14 meters), used interchangeably among modes for transporting cargoes.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Customs Broker</p>	<p>A licensed professional agent for an importer or exporter that prepares and submits all documents for clearing goods through customs.</p>	
<p>Drayage</p>	<p>Transporting of rail or ocean freight by truck to an intermediate or final destination over a short distance (e.g., from marine terminal to warehouse).</p>	
<p>Free Trade Zone (FTZ)</p>	<p>An area or zone set aside at or near a port or airport, under the control of the U.S. Customs Service, for holding goods duty-free pending customs clearance. There are seven Michigan cities that contain FTZs.</p>	
<p>Freight</p>	<p>Any good, product, or raw material carried by a commercial means of transportation, including air, highway, rail, water, and pipeline.</p>	
<p>Freight Forwarder</p>	<p>An individual acting as an agent on behalf of a shipper, involved in consolidations from several shippers and in coordinating booking reservations.</p>	
<p>Integrated Packages</p>	<p>Moved door-to-door by one company, such as UPS or FedEx, using company-owned vehicles or aircraft.</p>	
<p>Intermodal Terminal</p>	<p>A location where links between different transportation modes and networks connect.</p> <p><i>Source: MDOT Photography Unit</i></p>	

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Logistics	All activities involved in the management of product movement.
Receiving	The function encompassing the physical receipt of the material, the inspection of the shipment for conformance with the purchase order, the identification and delivery to destination, and the preparation of receiving reports.
Reliability	Refers to the degree of certainty and predictability in travel times on the transportation system.
Shipper	Party that tenders goods for transportation.
Supply Chain	Suppliers in the manufacturing process. All the manufacturers and suppliers who provide the parts that make up a particular product. The chain begins with unprocessed raw materials and ends with final customer using the finished goods.
Third-Party Logistics (3PL)	A firm that provides service to its customers of outsourced (or “third party”) logistics services for part or all of their supply chain management functions. Third party logistics providers typically specialize in integrated operation, warehousing and transportation services that can be scaled and customized to customers’ needs based on market conditions and the demands and delivery service requirements for their products and materials.
Ton	As a unit of cubic capacity, 1 ton equals 100 cubic feet. <ul style="list-style-type: none"> • Metric Ton - A unit of weight equivalent to 2,204.6 pounds. • Long Ton - A unit of weight equivalent to 2,240 pounds. • Short Ton - A unit of weight equivalent to 2,000 pounds.
Ton-Mile	A measure of output for freight transportation; reflects weight of a shipment and the distance hauled; a multiplication of tons hauled by the distance traveled.
Transload	To transfer from one mode of transportation to another. Transload facilities may require a storage facility, such as a warehouse or railyard.
Transportation, Distribution, and Logistics (TDL)	A broad industry sector responsible for managing the flow of goods, information, and people between a point of origin and a point of consumption in order to meet the requirements of consumers.
Twenty-Foot Equivalent Unit (TEU)	The 8-foot by 8-foot by 20-foot intermodal container used as a basic measure and is the standard measure for containerized cargo.

Trucking Terminology	
Average Annual Daily Truck Traffic (AADTT)	The total volume of truck traffic on a highway segment for one year, divided by the number of days in a year.
Chassis	An undercarriage with wheels constructed to accommodate containers as they move over the road.
Commercial Vehicle	All motor vehicles used in the transportation of passengers for hire or constructed for transportation of goods, wares, or merchandise.
Gross Vehicle Weight	The weight of the vehicle or combination of vehicles, fully equipped for service, plus the weight of the maximum load.
Heavy-Duty Truck	<p>A motor vehicle or combination of vehicles operated as a unit that has a combined weight that is greater than 26,000 pounds, typically 32,000 pounds in Michigan.</p> <p><i>Source: MDOT Photography Unit</i></p> 
Hours of Service	Ruling that stipulates the amount of time that a truck driver is allotted to work.
International Fuel Tax Agreement (IFTA)	An agreement among states and Canadian provinces to simplify the reporting of fuel use taxes by interstate motor carriers, to determine the net tax or refund due and to redistribute taxes from collecting states to states where the trucks were in operation.
International Registration Plan (IRP)	A registration reciprocity agreement among states of the United States, the District of Columbia and provinces of Canada that allows each state to receive a share of the motor vehicle registration fee based on the total distance operated within each respective state or province.

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<p>Less-Than-Truckload (LTL)</p>	<p>A container or trailer loaded with cargo from more than one shipper; loads that do not by themselves meet the container load or truckload requirements.</p>	
<p>Level of Service (LOS)</p>	<p>A qualitative assessment of a road's operating condition that indicates the capacity per unit of demand for each public facility.</p>	
<p>Longer Combination Vehicles (LCVs)</p>	<p>Truck configurations whose length and width dimensions exceed the size of more conventional truck-and-trailer or tractor-semitrailer combinations.</p>	
<p>Medium-Duty Truck</p>	<p>A commercial motor vehicle or combination of vehicles that has a combined weight that is greater than 10,000 pounds but less than or equal to 26,000 pounds. This is the most common type of commercial vehicle in Michigan, with 47,260 registrations in 2013, about 39 percent of all Michigan-registered trucks.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Michigan Weight Law Truck</p>	<p>A commercial vehicle capable of carrying between 80,000 and 164,000 pounds on up to 11 axles. There are a total of 12,986 registrations of this vehicle type in Michigan, about 11 percent of all Michigan-registered trucks.</p> <p><i>Source: MDOT Photography Unit</i></p>	
	<p><i>Source: MDOT Photography Unit</i></p>	

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<p>Michigan Truck Operators Map</p>	<p>A publication managed by MDOT that includes information pertaining to operating a truck in the state of Michigan, including maximum allowable axle loadings; highway routes designated as Gold (National Truck Network) or Green (Special Designated State Highways); All-Season routes and routes with seasonal weight restrictions; Michigan laws pertaining to trucking; tolling rates and locations; overhead clearance; and pavement information.</p>	 <p>The image shows the cover of the '2015 Michigan Truck Operators Map' and a preview of its content. The cover features a blue semi-truck on a road. The map content includes a table of axle loadings, a map of Michigan with color-coded routes (Gold and Green), and a section on 'MDOT ROUNDABOUTS' with diagrams and instructions. Other sections include 'MICHIGAN STATE POLICE' and 'PS Drive'.</p>
<p>Owner-Operator</p>	<p>Trucking operation in which the owner of the truck is also the driver.</p>	
<p>Portable Intermittent Truck Weigh Station (PITWS)</p>	<p>PITWS are indentations in the pavement, of sufficient size and depth, for which portable scales may be temporarily placed. The PITWS allow CVE officers to weigh trucks on the same plane without elevating the truck through the use of blocking, a very labor-intensive method of weighing trucks. Essentially, scales are placed in the PITWS (cutout), flush with the surrounding pavement, allowing officers to weigh the vehicle by merely having the truck move forward over the scales, thereby weighing each axle efficiently.</p>	
<p>Private Carrier</p>	<p>A carrier that provides transportation service to the firm that owns or leases the vehicles and does not charge a fee.</p>	
<p>Refrigerated Trailer</p>	<p>Designed to control the temperature of perishable freight, such as fresh fruits, vegetables, frozen food and more.</p> <p><i>Source: Fleet Equipment</i></p>	 <p>A photograph of a white refrigerated semi-trailer with a large front-mounted refrigeration unit, parked on a road.</p>
<p>Semi-Trailer</p>	<p>A large commercial vehicle that consists of a detachable trailer for hauling freight, with wheels at the rear end, the forward end being supported by the rear of a truck tractor when attached. Also called a tractor-trailer, semi, big rig, or 18-wheeler in the U.S.</p> <p><i>Source: MDOT Photography Unit</i></p>	 <p>A photograph of a silver semi-truck tractor pulling a dark-colored trailer on a multi-lane highway.</p>

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<p>Standard Interstate Semi-Trailer</p>	<p>A commercial vehicle that adheres to the federal allowable maximum of 80,000 pounds on five axles, with four of the axles carrying 17,000 pounds. These vehicles are usable on the All-Season roads on the National Truck Network (also called Gold Routes on the Truck Operators Map).</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Straight Truck</p>	<p>Single-unit vehicle containing both the power unit and the trailer.</p>	
<p>Strategic Highway Network (STRAHNET)</p>	<p>A network of highways that are important to the U.S. strategic defense policy and that provide access, continuity, and emergency capabilities for defense purposes.</p>	
<p>Tractor</p>	<p>A large vehicle, or the front section of a truck used to haul heavy loads, with a driving cab, engine, and coupling for trailers.</p> <p><i>Source: MDOT</i></p>	
<p>Truck</p>	<p>Any of various forms of vehicle for carrying goods and materials, usually consisting of a single self-propelled unit but also often composed of a trailer hauled by a tractor.</p>	
<p>Truckload (TL)</p>	<p>Quantity of freight required to fill a truck, or at a minimum, the amount required to qualify for a truckload rate.</p>	
<p>Weigh-in-Motion (WIM)</p>	<p>Devices that are designed to capture and record axle weights and gross vehicle weights as vehicles drive over a measurement site, and are capable of measuring vehicles traveling at a reduced or normal traffic speed and do not require the vehicle to come to a stop.</p>	

Rail Terminology		
<p>Automotive Rack</p>	<p>Designed to ship domestic and imported automobiles, trucks, SUVs and mini-vans.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Boxcar</p>	<p>Designed to transport crated or palletized freight of all kinds. Boxcars are the most common type of rail cars, with a variety of sizes and features.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Bulk Unit Train</p>	<p>One of three types of rail service that typically moves very high volumes of a single commodity, such as coal, grain, minerals, or waste. Loaded from shipper to receiver and returned empty.</p>	
<p>Carload</p>	<p>Quantity of freight (in tons) required to fill a railcar; amount normally required for a carload rate.</p>	
<p>Centerbeam</p>	<p>Designed to transport bundled building supplies, a center partition secures the product in place.</p>	
<p>Class I Railroad</p>	<p>A railroad having annual carrier operating revenues of \$433.2 million or more.</p>	
<p>Coil Car</p>	<p>Designed for products such as coiled steel, steel plate or high grade ores.</p>	
<p>Container-on-Flatcar (COFC)</p>	<p>Containers are placed directly on standard flatcars.</p>	

<p>Covered Hopper</p>	<p>Designed to handle shipments of free-flowing dry bulk commodities. Cars are loaded from the top and product is discharged from the bottom.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Divestiture</p>	<p>The sale of property. In Michigan, the State Transportation Preservation Act of 1976 (Act 295 of 1976) created a mechanism to preserve critical rail corridors, including rail rights of way. The objective of this legislation was to return commercially viable rail operations to the private sector, thus minimizing state involvement where not necessary to support the state's transportation goals.</p>	
<p>Double-Stack</p>	<p>Containers are placed two-high in a special low-profile "well car."</p>	
<p>Flatcar</p>	<p>Designs come in a variety of lengths, tonnage and capacities for specialized commodities that are not subject to damage from the elements.</p>	
<p>Gondola</p>	<p>Designed to ship heavy bulk commodities that includes scrap metal, aggregates, logs, lumber, etc.</p>	
<p>Grade Crossing</p>	<p>Railroad crossing level with road: a place where a road crosses a railroad or two rail lines cross at the same level.</p>	
<p>Intermodal</p>	<p>Rail service that typically moves truck trailers or containerized goods, including finished consumer goods, refrigerated foods, parts, etc.</p>	
<p>Roadrailer</p>	<p>A highway trailer, or semi-trailer, that is equipped for use in railroad intermodal service.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Interstate Commerce Commission (ICC)</p>	<p>Original federal oversight agency established in 1887 and abolished in 1995. Remaining functions were transferred to the Surface Transportation Board.</p>	

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Mixed Carload	Rail service that typically moves a diverse range of commodities and equipment, including liquid-bulk tank cars, open flatcars, hopper cars, and traditional boxcars.	
Open Top Hopper	Designed to handle heavy dry bulk commodities that are not affected by weather conditions and will flow or discharge through the bottom gates into storage pits.	
Positive Train Control (PTC)	Technologies designed to automatically stop or slow a train before certain crashes caused by human error occur.	
Refrigerated Boxcar	Designed to control the temperature of perishable freight, such as fresh fruits, vegetables, frozen food and more.	
Regional Railroad	Railroad defined as line-haul railroad operating at least 350 miles of track and/or earns revenue between \$40 million and \$433.2 million per year.	
Short Line Railroad	Freight railroads that operate less than 350 miles of track and earn less than \$40 million per year in revenue.	
Siding	A very short branch off a main railway line with only one point leading onto it. Sidings are used to allow trains to pass one another, to conduct maintenance, or to connect to a single warehouse or loading site.	
Strategic Rail Corridor Network (STRACNET)	An interconnected and continuous rail line network consisting of more than 38,000 miles of track serving more than 170 defense installations.	
Switching and Terminal Railroad	Provides pick-up and delivery services to line-haul carriers.	
Tank Car	<p>Used to ship compressed or liquid commodities, the majority of tank cars are owned by non-railroad companies.</p> <p><i>Source: MDOT Photography Unit</i></p>	
Trailer-on-Flatcar (TOFC)	Over-the-road trailers or containers mounted on truck chassis are placed directly on flatcars.	

Marine Terminology

<p>1,000-footer</p>	<p>Largest of the ships on the Great Lakes that are only able to operate in the four upper Lakes (Superior, Huron, Michigan, and Erie) as they are too large to fit through the St. Lawrence Seaway locks. The largest “1,000-footer” is 1,013 feet in length and 105 feet in width.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Ballast</p>	<p>Stone, rock, water, or other material placed in an empty or lightly loaded ship for the purpose of steadying it in rough waters.</p>	
<p>Barge</p>	<p>Unpowered vessel that needs to be towed or pushed by tugboats. Since the 1970s, the U.S. Coast Guard has allowed limited river barge operations in southern Lake Michigan. The U.S. inland river navigation system connects to the Great Lakes navigation system at Chicago. Through this gateway, river barge activity has developed into a significant trade serving heavy industry in that region.</p> <p><i>Source: MDOT</i></p>	
<p>Beneficial Use</p>	<p>A general term used to describe alternatives for managing dredged material by focusing on its value as a resource and not as a waste.</p>	
<p>Breakwater</p>	<p>Structures constructed on coasts as part of coastal defense or to protect an anchorage from the effects of both weather and littoral drift.</p>	
<p>Cabotage</p>	<p>Refers to the Jones Act, also known as the Merchant Marine Act of 1920, section 27, which requires that freight originating at one port in the U.S. and terminating in another port in the U.S. must travel in vessels built in the U.S., owned by U.S. citizens, registered in the U.S., and manned by U.S. citizens.</p>	
<p>Channel</p>	<p>The buoyed, dredged, and policed fairway through which ships pass.</p>	

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Confined Disposal Facility (CDF)	<p>An engineered structure designed to provide the required storage volume for dredged material and to meet the required suspended solids in effluent released from the facility.</p>	
Deep Draft	<p>A navigable waterway used by merchant ships with loaded drafts of 14 to 60-plus feet. Great Lakes-St. Lawrence Seaway “deep draft” is 26 feet, 6 inches, while ocean “deep draft” is typically 50-plus feet.</p>	
Dredging	<p>Involves periodic removal of accumulated bottom sediments from waterways to maintain adequate depth for safe and efficient vessel operations. It also is used as a way to replenish sand on some public beaches, where sand has been lost because of coastal erosion.</p>	
Great Lakes St. Lawrence Seaway System	<p>A deep draft waterway extending 2,340 miles from the Atlantic Ocean to the head of the Great Lakes, in the heart of North America. Includes 13 Canadian and two U.S. locks.</p>	
Laker	<p>Vessel designed to transport dry bulk cargo in the Great Lakes-St. Lawrence Seaway System. Constructed to withstand weather, wave action and ice conditions unique to the Great Lakes.</p> <p><i>Source: MDOT Photography Unit</i></p>	
Littoral Drift	<p>Consists of the movement of sediments along a coast at an angle to the shoreline, which is dependent on prevailing wind direction and swash. This process occurs in the littoral zone, and in or close to the surf zone.</p>	
Lock	<p>A channel where the water is raised or lowered to allow boats to travel between water bodies with different elevations.</p> <p><i>Source: MDOT Photography Unit</i></p>	

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Marine Terminals	Parcels of land, generally adjacent to the waterway, that have adequate structures and equipment to load, unload, or store marine cargoes or passengers.	
Navigation Channel	A deeper channel cut into the lake or river bed to enable larger ships to pass through to a port.	
Ocean-Going (“Saltie”)	<p>Designed to handle either dry bulk or breakbulk cargo, and might carry a cargo of steel products into the Great Lakes and export a cargo of bulk grain. Salties are designed to handle both lake and ocean conditions and may operate almost anywhere in the world.</p> <p><i>Source: MDOT Photography Unit</i></p>	
Port	Generally a harbor and terminal facilities. A location on a navigable body of water where commodities are shipped and received by water vessels.	
Seawaymax	Vessels constructed to take advantage of the maximum capacity of the entire St. Lawrence Seaway. These vessels measure 740 feet in length and 78 feet in width, and have a draft of 26.5 feet.	
Sedimentation	Process by which any particulate matter is transported by fluid flow and deposited as a layer of solid particles on the bed or bottom of a body of water or other liquid.	
Self-Unloaders	<p>A type of Laker equipped with technology that enables the crew to unload the vessel without the need for shore-side personnel or equipment. Self-unloading vessels are distinctive in appearance and feature a large steel boom extending down the deck from the ship’s superstructure. When unloading, cargo is released through gates at the bottom of the cargo hold onto conveyor belts running below. Bulk material is carried along the conveyor belts and lifted or “gearless” up and out onto the adjacent dock via the pivoting boom.</p> <p><i>Source: MDOT Photography Unit</i></p>	
Short-Sea Shipping	Describes operations between ports along a single coast or involving a short sea crossing also referred to as “marine highway.”	

Freight Primer: An Introduction to Freight Modes in Michigan

<p>Soo Locks</p>	<p>A series of locks located between Sault Ste. Marie, Mich., and Sault Ste. Marie, Ontario (hence the nickname “Soo”). The largest lock chamber is 1,200 feet long by 110 feet wide by 32 feet deep. Several ships have been constructed to take full advantage of these dimensions (see “1,000-footer”).</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Straight-Deckers</p>	<p>A handful of Lakers do not feature self-unloading technology and are referred to as “straight deckers” or “bulklers.” These vessels require shore-side equipment, such as a gantry crane to unload cargo.</p>	
<p>Tankers</p>	<p>Designed to carry liquid bulk cargo, such as petroleum products. Most tankers operating on the Great Lakes-St. Lawrence Seaway System are designed exclusively for Great Lakes service; however, several have the capability to operate overseas.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>Truck Ferry</p>	<p>The Detroit-Windsor Truck Ferry is one of the few ferry services of its kind, and is a crossing primarily for hazardous materials (HAZMAT) or oversize/overweight (OS/OW) trucks between Windsor and La Salle in Ontario, and Detroit and the Downriver communities in Michigan.</p> <p><i>Source: MDOT Photography Unit</i></p>	
<p>U.S. Army Corps of Engineers</p>	<p>Federal agency responsible for operations and maintenance work within the federal harbor system, including the navigation channels, breakwaters, and locks.</p>	

Air Terminology

Belly Cargo

Air freight carried in the belly below the main deck of a passenger aircraft.

Cargo Service Airports

Airports that, in addition to any other air transportation services that may be available, are served by aircraft providing air transportation of only cargo with a total annual landed weight of more than 100 million pounds.

Commercial Service Airport

Publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service.

Source: MDOT Photography Unit





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