MICHIGAN'S TRUCK-WEIGHT LAW
And TRUCK-USER FEES

Trucks are essential to Michigan's economy. Trucks carry about two thirds of all freight tonnage moving in Michigan. (Railroads and Great Lakes freighters carry the remainder). Trucks carry the great majority of Michigan freight by value.

Michigan has a unique system of truck-weight law based on maximum axle loadings, not gross vehicle weight. *Gross vehicle weight* (GVW) includes the weights of the truck, cargo, fuel, and driver; *axle loading* is the weight on a single axle. Maximum allowable axle loadings are the same for a standard truck in all states, but Michigan allows use of more axles in combination with lower axle loadings, for a greater gross vehicle weight than other states.

History

Before World War II, Michigan did not limit the number of axles that could be used on trucks. Between 1942 and 1967, there were limits on overall length and per-axle loading, limiting vehicles to a maximum of thirteen axles and a gross weight of 169,000 pounds. Since 1967, the maximum number of axles has been limited to eleven, and per-axle load restrictions have resulted in a maximum gross vehicle weight of 164,000 pounds.

Since 1982, federal law has required all states to allow gross vehicle weights of 80,000 pounds on the Interstate system and other designated highways, and for certain distances off these highways *en route* to terminals or services. These 80,000 pounds are typically spread over five axles, including a three-axle tractor with a tandem-axle semi-trailer—the familiar "eighteen-wheeler."

Michigan and several other states (and Canadian provinces) allow gross vehicle weights greater than 80,000 pounds, when spread over more than five axles. These weight laws are allowable under "grandfather clauses" in federal law, but if repealed, they may not be re-enacted.

Axle Loadings and Michigan Law

Michigan's truck-weight law is designed to control *axle loads* instead of *gross vehicle weight*. Research conducted by the American Association of State Highway and Transportation Officials, the Michigan Department of Transportation (MDOT), and other organizations, has shown that pavement damage is most directly related to axle loadings, not gross vehicle weight. Michigan limits the weight allowed on individual axles, depending upon the spacing between them, with a maximum of eleven axles.

The maximum gross vehicle weight allowed on a "federal-weight-law truck" is 80,000 pounds, with two pairs of tandem axles carrying 17,000 pounds each and the steering axle carrying 12,000 pounds. The maximum allowable gross vehicle weight on the heaviest "Michigan-

weight-law truck" is 164,000 pounds, which can be achieved by use of eleven properly-spaced axles. Most of these axles carry 13,000 pounds each. The alternative to a single Michigan combination carrying 160,000 lbs. on 11 axles is two standard trucks carrying 160,000 lbs. on 10 axles. Pavement research has shown that these two smaller trucks actually cause about 60 per cent more pavement damage than does the single heavier truck, because of their higher axle loadings and the extra weight of an additional tractor at about ten tons.

Population of Trucks by Elected Gross Vehicle Weight

In December, 2012, there were 79,865 trucks registered for intrastate travel in Michigan, according to the Secretary of State; in May, 2013 there were 40,079 apportioned license plates under the International Registration Plan (IRP), for a total of about 120,000 Michigan-based trucks. (This does not include 44,462 farm and log trucks; see below.) Of these, 12,978 Michigan-based trucks were registered for operation above 80,000 lbs. when in Michigan, or 10.8 per cent. After allowing for empty backhauls, operation at less than the elected maximum weight, and trucks from other states, it is estimated that around 5% of all trucks using Michigan roads weigh more than 80,000 pounds when operated.

	Intrastate	Interstate	All	Registration Fee	
Elected Gross Weight	Trucks	Trucks	Trucks	2016	2017
0 to 24,000 lbs.	38,071	744	38,815	$491	$590
24,001 to 26,000	8,079	405	8,484	558	670
26,001 to 28,000	1,812	166	1,978	558	670
28,001 to 32,000	4,668	1,459	6,127	649	779
32,001 to 36,000	3,309	834	4,143	744	893
36,001 to 42,000	1,756	622	2,378	874	1,049
42,001 to 48,000	2,765	633	3,398	1,005	1,206
48,001 to 54,000	5,384	1,929	7,313	1,135	1,362
54,001 to 60,000	1,278	502	1,780	1,268	1,522
60,001 to 66,000	1,020	657	1,677	1,398	1,678
66,001 to 72,000	2,612	559	3,171	1,529	1,835
72,001 to 80,000	2,756	24,946	27,702	1,660	1,992
80,001 to 90,000	924	1,026	1,950	1,793	2,152
90,001 to 100,000	778	1,038	1,816	2,002	2,403
100,001 to 115,000	710	584	1,294	2,223	2,668
115,001 to 130,000	737	669	1,406	2,448	2,938
130,001 to 145,000	587	692	1,279	2,670	3,204
145,001 to 160,000	2,328	1,578	3,906	2,894	3,473
160,001 to 164,000	321	1,036	1,327	3,117	3,741
All elected-GVW trucks	79,895	40,079	119,974		

Revenue from intrastate (unapportioned) trucks, 2013	$67,551,411
I.R.P. (apportioned) revenue from miles traveled in Michigan	59,715,084
Total truck registration revenue, 2013	$127,266,495

The operating weight of trucks is not known. Trucks frequently carry less than their elected gross weight, and it is not known how many miles are traveled by trucks of various weights. For interstate trucks based in other states and provinces, it is not known what weights they elect to register at for operation in Michigan; it is probably seldom over 80,000 lbs.

Trucks with Discounted Fees: Farm, Milk, and Log Trucks

Michigan trucks that carry farm commodities, milk, or logs pay greatly-reduced registration fees based not on gross vehicle weight, but at a rate of 74 cents per hundred pounds of weight of the tractor or empty truck. In late 2013 there were 46,714 such trucks, reducing MTF revenues by an estimated $30 million/year at 2017 rates. Because these trucks pay no elected-GVW fees, it is not known how many farm, log, and milk trucks operate above 80,000 pounds. Many are light vehicles, but of the two classes of discounted farm trucks, 8,666 are tractor-trailers, presumably operating at 72,000 lbs. or above. Some of these trucks see only limited use during harvests. ("Special" farm trucks are for use to and from fields, and the $20 fee is retained by Secretary of State.)

Discounted Truck Class	Number	Average Annual Registration Fee	Annual MTF Revenue
Farm trucks	38,342	$72.71	$2,787,896
"Special" farm trucks	6,120	20.00	0
Milk-hauling trucks	150	129.80	19,321
Log trucks	2,334	107.30	250,446
	46,946		$3,057,663

Truck Fuel Taxes

The $0.263/gallon tax on Diesel motor fuel is the primary truck road-user fee. A typical 80,000-lb. truck gets about 6 miles per gallon. Trucks in interstate commerce pay fuel taxes on a per-mile basis, according to miles accumulated in each state, under the International Fuel Tax Agreement (IFTA); state revenues do not depend on where a truck operator buys fuel. Diesel fuel bought in Michigan is subject to Michigan's 6-per-cent sales tax for schools and local governments; fuel bought elsewhere but burned on Michigan roads is surtaxed 6% under IFTA, and this surtax is credited to the Michigan Transportation Fund (MTF) for transportation use.

Total of Truck Road-user Fees; Distribution

Truck contribution to the Michigan Transportation Fund is the sum of registration and fuel taxes. For an 80,000-lb. truck in high-mileage over-the-road service, the sum of all state and federal road-user fees will be about 11.19 cents/mile, or $9,050/year. Medium- and heavy-truck users paid 13.8 per cent of all Michigan road-user fees in Fiscal 2012:

Weight-based truck registration tax	$67,551,411
International Registration Plan	59,715,084
Farm, milk, and log trucks	3,057,663
Diesel fuel tax (including IFTA)	126,781,882
Total of truck road-use fees	$257,106,040
MTF revenue from all vehicles, 2012:	$1,858,160,483

Truck-user fees are distributed to Michigan transportation agencies in generally the same fashion as light-vehicle fees. Revenue distribution does not match the distribution of truck traffic:

Transportation Program	MTF Revenue Distribution	Share of Truck-miles
State highways	36%	65%
Local roads	55	35
Public transportation	9	--

Economic Benefits

While the number of trucks operating above 80,000 lbs. is relatively small, they are extremely important to basic industries in this state. The primary users of heavier trucks are the manufacturing, mining, forestry, agricultural, and construction sectors. Specific commodities hauled include automotive and other sheet steel, structural steel, factory tooling and other metal products, automotive power trains, stone and aggregate, cement, asphalt pavement, fuel, beverages and other retail goods, logs, lumber and other wood products, fertilizer, milk, and field crops that are heavy when harvested such as corn, soybeans, and especially sugar beets.

The Michigan Department of Transportation has designed our pavements and bridges to safely accommodate trucks conforming to our axle-weight law. Our axle-weight formula results in less pavement damage and a more productive and efficient transportation system.

Michigan industries and businesses are more competitive due to our truck weight laws. Freight rates are lower in Michigan for commodities that can use our heavier vehicles because fewer vehicles, drivers, and trips are required. Rates for these commodities have been estimated to be up to 50% lower than those found in adjacent states. In addition, less fuel is burned to transport the same weight of cargo, and there is less traffic congestion and less crash risk from fewer vehicles.

Because of market patterns of the commodities hauled, Michigan-weight-law trucks have limited backhaul opportunities. That is, trips are frequently one-way movements of cargo with an empty return. (Examples include logs from the forest to pulp or lumber mills, petroleum to retail service stations, and construction materials from suppliers to construction sites.) As a result, these bulk-commodity haulers operate empty half the time, causing minimal highway wear. The lack of backhaul opportunities means it is important for those industries to move their products efficiently, by using the fewest trucks making the fewest trips possible.

Significant road construction and maintenance savings are realized as a result of reduced transportation costs of stone, cement, asphalt, and salt used on public highways.

Michigan bridges are designed to carry the concentrated weight of Michigan trucks, being 1.2 times stronger than the national standard. If Michigan were to impose federal-standard truck weights, the state would waste the investment in bridges designed to carry heavier, more productive trucks, and basic industries would lose a significant cost advantage of locating in this state.

Safety

The use of heavy trucks under Michigan's axle-weight law enhances highway safety. There are fewer trucks on the road because each 164,000-pound truck can carry the cargo of about two and a quarter 80,000-pound trucks. Without Michigan's axle weight law, an additional 10,000 to 15,000 trucks would be on our highways, resulting in a greater exposure to traffic crashes.

Vehicle braking capability and resistance to overturning are improved by having more axles and wheels, each of which is equipped with brakes, and by carrying lower weight per axle.

Congestion on Michigan's highways is reduced because fewer trucks are required to move our freight. Each truck occupies roadway space equivalent to approximately four automobiles. This is particularly important in urban areas where many truck users are located.

Trends

National trends in regulation and research are toward lower axle weights and higher gross vehicle weights. Someday, more of the nation may emulate Michigan's approach to truck-weight law. In 2013, Ohio, Florida, Idaho and other states were debating heavier gross vehicle weights.

There is some possibility that federal law will be changed to permit longer or heavier trucks on the national network. It has been proposed several times to change the Interstate-standard truck, most recently during the 2012 federal highway bill, but in 2017 no change has been enacted. The most common proposal has been a GVW of 97,000 lbs. This would add one 17,000-lb. axle to a standard 53-foot trailer, as is already allowed in Michigan.

The Transportation Research Board (TRB) published research, referred to as the "Turner Proposal," to allow heavier gross vehicle weights on more axles, with each axle carrying less weight than currently allowed under federal law. This is the philosophy adopted by Michigan. Researchers concluded that such vehicles would result in a net decrease of $326 million in annual pavement and bridge costs nationally. Shippers and businesses would save an estimated $2 billion annually in transportation costs.

States and provinces bordering Michigan allow certain vehicles heavier than the federal-weight-law trucks. Ontario allows nine-axle vehicles carrying a total of 140,000 pounds. Ohio, Indiana, and Wisconsin issue permits allowing heavier Michigan-style trucks to travel on selected highways. This allows access by Michigan shippers to the steel industry in Gary, bulk rail and marine terminals in Toledo, and the forest industry in northern Wisconsin. Canada and Mexico allow trucks heavier than 80,000 lbs.; states along the Canadian and Mexican borders increasingly allow heavier trucks from their neighboring countries, either routinely or by permit.

In Canada, the provinces of Ontario, Québec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland recognize the importance of uniformity with Michigan law. Because of their volume of trade with Michigan they are working to establish more uniform truck regulations. The North American Free Trade Agreement (NAFTA), between Canada, the United States and Mexico, requires efforts to harmonize regulation of truck size and weight. Canadian provinces generally allow heavier axle loadings; Mexico does not regulate axle loadings, only gross vehicle weights. Michigan participates on NAFTA committees addressing these issues.

Impacts of Adopting the Federal Weight Law

Periodically it is suggested that Michigan should adopt federal weight law and reduce gross vehicle weights. There would be several impacts of such action, including—

- more trucks on Michigan's roads
- greater roadway congestion, particularly in urban areas
- more crash exposure as a result of more trucks
- increased costs to Michigan consumers for goods such as gasoline, milk, lumber, agricultural products, and products containing steel
- decreased competitiveness for Michigan's steel, manufacturing, mining, forestry, and agricultural industries due to increased transportation costs
- more damage to pavements due to increased axle loadings
- increased costs for building and maintaining roads

Summary

Michigan's roads, truck fleets, plants, warehouses, and elevators form a unified logistics system designed to perform efficiently for Michigan firms and producers. Pavements are designed to carry a specific number of axle loadings over their lifetime, and bridges for a certain gross vehicle weight. Truck operators invest in vehicles designed to operate at certain weights. It is not possible to change any one part of the pavement–bridge–truck system without large economic losses, and without throwing away the investment in the other two parts of the system.

If pavements fail, it is because they have exceeded their designed life, or because funds were unavailable for necessary preservation actions to prevent damage from the interaction of traffic, freeze/thaw cycles, and water intrusion.

The Michigan Department of Transportation believes that Michigan's truck weight law is based on sound research and results in less highway damage and improved safety, relative to federal weight law. Several of this state's key industries benefit by being able to transport their goods more efficiently and economically. Recent trends and studies suggest that the federal government and other jurisdictions are beginning to recognize the validity and benefits of the approach Michigan has used for decades.

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