



Senate Fiscal Agency
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Senate Bill 501 (Substitute S-1 as passed by the Senate)
Sponsor: Senator Darrin Camilleri
Committee: Transportation and Infrastructure

Date Completed: 11-21-23

RATIONALE

Electric vehicles are often heavier than their diesel counterparts because of the weight of their batteries. For example, in 2022, truck manufacturer Freightliner released the eCascadia electric semi-truck, which weighs 4,000 pounds more than an average diesel semi-truck; by 2030, an electric semi-truck could outweigh its diesel counterparts by 5,000 pounds or more.¹ This additional weight ultimately would decrease the amount of cargo that an electric vehicle could transport, and testimony before the Senate Committee on Transportation and Infrastructure indicates that many truck carriers are unwilling to sacrifice this cargo space. If carriers do not accommodate heavier batteries, the transition to electric semi-trucks would be delayed, and so it has been suggested that the weight load maximums for electric semi-trucks be increased.

CONTENT

The bill would amend the Michigan Vehicle Code to do the following:

- **Allow an electric vehicle or combination of electric vehicles weighing up to 82,000 pounds to exceed current axle loading and weight load maximums by up to 2,000 pounds.**
- **Increase, from 80,000 to 82,000 pounds, the maximum gross weight of a natural gas-powered vehicle or combination of natural gas-powered vehicles that could exceed current axle loading and weight load maximums by up to 2,000 pounds.**

Among other things, the Code prescribes the *normal loading maximum*, the maximum axle loads for vehicles exceeding 80,000 pounds in gross weight, as follows:

- If the axle spacing on a vehicle is nine feet or more between axles, the maximum axle load must not exceed 18,000 pounds for vehicles equipped with high pressure pneumatic or balloon tires.
- If the axle spacing is less than nine feet between two axles but more than three and a half feet, the maximum axle load must not exceed 13,000 pounds for high pressure pneumatic or balloon tires.
- If the axles are spaced less than three and a half feet apart, the maximum axle load must not exceed 9,000 pounds per axle.

("Maximum axle load" means the gross weight over the axle which includes vehicles and load. "Gross weight" means the weight of a vehicle without load plus the weight of any load thereon.)

¹ Giacobone, Bianca, "Electrifying trucking will mean sacrificing critical weight for heavy batteries, eating into already-slim margins", *Business Insider*, February 2, 2023.

Vehicles that have a gross vehicle weight of *up to* 80,000 pounds are subject to the following load maximums:

- 20,000 pounds on any one axle, including all enforcement tolerances.
- A tandem axle weight of 34,000 pounds, including all enforcement tolerances.²
- An overall gross weight on a group of two or more consecutive axles equaling:
 $W = 500[(LN)/(N-1) + 12N + 36]$.³

(For more information, see **BACKGROUND**).

Under the bill, a vehicle or combination of vehicles that weighed up to 82,000 pounds and that was powered in whole or in part by electric batteries could exceed the above axle loading maximums and the weight load maximums by a gross weight of not more than 2,000 pounds for all axles of the truck, truck tractor, or power unit.

Additionally, a natural gas-powered vehicle or combination of natural gas-powered vehicles that have a gross weight of up to 80,000 pounds may exceed the above axle loading and weight load maximums by an amount equal to the difference between the weight of the vehicle attributable to the natural gas tank and fueling system carried by that vehicle and the weight of a comparable diesel tank and fueling system. The bill would increase the gross weight of a vehicle eligible for this extension from 80,000 pounds to 82,000 pounds. Additionally, it would specify that the natural gas-powered vehicle or combination of natural gas-powered vehicles could not exceed these maximums by a total of not more than 2,000 pounds *for all axles of the truck, truck tractor, or power units*.

MCL 257.722

BACKGROUND

The Code establishes axle loading maximums as follows:

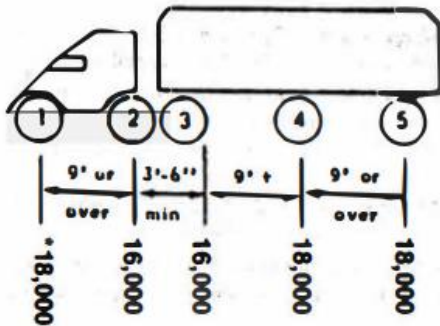
| MAXIMUM ALLOWABLE GROSS AXLE LOADINGS | | | | |
|---|---|--|--|----------------|
| Spacing Between Axles | Normal Loadings When Seasonal Load Limitations Are Not In Force | | Seasonal Load Limitations (Speed Limit 35 MPH) | |
| | Vehicles Exceeding 80,000 lbs. Gross Weight | † Vehicles 80,000 lbs. OR Under Gross Weight | Rigid | Flexible |
| | | | 25% reduction | 35% reduction |
| 9 feet or over | 18,000 lbs. | 20,000 lbs. | 13,500 lbs. | 11,700 lbs. |
| More than or equal to 3 ½ feet but less than 9 feet | 13,000 lbs. | | 9,750 lbs. | 8,450 lbs. |
| When part of a tandem axle assembly | *16,000 lbs. | 34,000 lbs. on tandem | **12,000 lbs. | ***10,400 lbs. |
| When less than 3 ½ feet | 9,000 lbs. | | 6,750 lbs. | 5,850 lbs. |
| Maximum load on any wheel shall not exceed: (lbs. per inch of tire width) | 700 lbs. | 700 lbs. | 525 lbs. | 450 lbs. |

† Gross vehicle weight may not exceed 80,000 lbs. and the Bridge Gross Weight Formula as follows: An overall gross weight on a group of 2 or more consecutive axles equaling: $W = 500 [(LN / (N - 1)) + 12N + 36]$

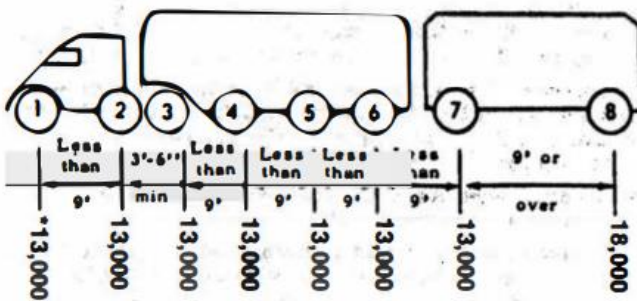
The following are examples of axle loading maximums for a vehicle over 80,000 pounds:

² A tandem axle is two axles, one placed in front of the other in close proximity.

³ In this equation, W = the overall gross weight on a group of two or more consecutive axles to the nearest 500 pounds, L = distance in feet between the extreme of a group of two or more consecutive axles, and N = number of axles in the group under consideration.



Axles 2 and 3 are part of a tandem axle assembly. As such, their maximum allowable gross axle loadings are 16,000 pounds. Because axles 1, 4, and 5, are at least 9 feet away from another axle, their maximum loadings are 18,000 pounds.



Because axles 1 through 7 are less than nine feet but more than three and a half feet away from each other, their maximum allowable gross axle loadings are 13,000 pounds. Axle 8 is at least nine feet from axle 7. As such, its maximum allowable gross axle loading is 18,000 pounds.

(The chart and images are from the Michigan Department of Transportation's *Maximum Legal Truck Loadings and Dimensions*).

ARGUMENTS

(Please note: The arguments contained in this analysis originate from sources outside the Senate Fiscal Agency. The Senate Fiscal Agency neither supports nor opposes legislation.)

Supporting Argument

According to testimony before the Senate Committee on Transportation and Infrastructure, the bill would provide electric vehicles a competitive advantage in the market for the benefit of the environment. Michigan's transportation sector contributes 28% of the State's total greenhouse gas (GHG) emissions, with 21% from freight vehicles.⁴ Currently, freight transportation makes up 8% of global GHG emissions.⁵ Transportation equipment also emits over 20% of the world's black carbon, a powerful short-lived climate pollutant.⁶ Both GHG and black carbon emissions, in addition to their contribution to climate change, present health concerns. A 2019 study by the International Council on Clean Transportation linked exhaust from on-road diesel vehicles to around 181,000 premature deaths worldwide in 2010 and

⁴ Michigan Department of Transportation, *Michigan State Plan for Electric Vehicle Infrastructure Deployment*, p. 24, August 2022.

⁵ "Freight Transportation", MIT Climate Portal. Retrieved on 11-16-2023.

⁶ *Id.*

2015.⁷ Reportedly, demands on freight transportation are expected to grow over the next few decades, which could lead to an increase in GHG and black carbon emissions.

Encouraging the electrification of the State's freight transportation industry would help mitigate the industry's environmental impact. Generally, electric vehicles have zero tailpipe emissions. The total GHG emissions associated with manufacturing, charging, and driving an EV are typically lower than the total GHGs associated with a gasoline car.⁸ More electric vehicles on the road would lower GHG and black carbon emissions, which could create a healthier population and environment in Michigan.

Supporting Argument

The bill also would align Michigan's weight exemptions with Federal law. In 2015, President Barack Obama signed the Fixing America's Surface Transportation Act, which allowed natural gas-powered vehicles to exceed any vehicle weight limit up to a maximum gross vehicle weight of 82,000 pounds. In 2019, President Donald J. Trump signed into law the Consolidated Appropriations Act. Among other things, the Act amended Title 23 of the United States Code to allow an electric vehicle to exceed the weight limit on the power unit by up to 2,000 pounds, for up to a maximum gross vehicle weight of 82,000 pounds.⁹ While Michigan allows *natural gas-powered* vehicles 2,000 pounds in additional weight, it does not grant the same additional weight to *electric vehicles*. Michigan law should be amended to align with Federal electric vehicle weight exemptions.

Response: While Federal law allows for 2,000 pounds in additional weight, Michigan could take a step further and allow for a larger weight exemption. Vehicles with longer ranges require large batteries; for example, a vehicle with a 235-mile range may require 480 kilowatts per hour of energy, necessitating a 6,600-pound battery.¹⁰ With such large batteries, the 2,000-pound weight allowance may not be enough. Instead, Michigan could enact a larger weight exemption for electric vehicles, perhaps sunseting the provision in anticipation of the development of lighter batteries.

Opposing Argument

Allowing electric vehicles to bear additional weight could damage the State's roads and endanger other drivers. Electric vehicles are heavier than diesel-fuel vehicles, potentially putting strain on roads that already are in poor condition. In 2023, the American Society of Civil Engineers gave Michigan's roads a D on the State's Infrastructure Report Card, with 25% of pavement in good condition, 45% in fair condition, and 33% in poor condition.¹¹ Electric vehicles could damage roads, forcing the State to spend more to fix and maintain roadways. Repaving roads also could have negative environmental effects, as repaving equipment requires fuel.¹²

In addition, heavier electric vehicles could create safety issues. In 2022, out of the 1,053 fatal motor vehicle crashes that occurred in Michigan, 105 involved tractor trailers and resulted in 105 deaths.¹³ Accidents involving heavy electric vehicles could increase the rate of accident

⁷ Anenberg, Susan, et al., *A Global Snapshot of the Air Pollution-Related Health Impacts of Transportation Sector Emissions in 2010 and 2015*, February 26, 2019.

⁸ "Electric Vehicle Myths", United States Environmental Protection Agency. Retrieved on 11-16-2023.

⁹ 23 U.S. Code § 127

¹⁰ Park, Jim, "What Fleets Need to Know About Electric-Truck Batteries", *HDT Truckinginfo*, April 11, 2022.

¹¹ Michigan Section of the American Society of Civil Engineers, *2023 Report Card for Michigan's Infrastructure*, 2023.

¹² Pittman, Mark, "Electric Vehicles and the Impact on Infrastructure", *Forbes*, December 29, 2022.

¹³ "How Many Accidents Are Caused by Semi Trucks?", www.michiganautolaw.com. Retrieved on 11-16-2023.

fatality. The State should consider the dangers presented by electric vehicles to its roads and drivers.

Opposing Argument

Encouraging trucking companies to adopt electric vehicles could reduce revenue to the State. Diesel vehicles are subject to excise taxes on motor fuel and registration fees. For example, the Motor Fuel Tax Act (MFTA) prescribes a tax on the sale and use of certain types of fuel in motor vehicles on the public roads or State highways and on certain other types of gas.¹⁴ Taxes prescribed by the MFTA are deposited into the Michigan Transportation Fund (MTF)¹⁵ and the Comprehensive Transportation Fund, which is used to fund public transportation. Currently, electric vehicles are not subject to these taxes and fees. Therefore, as they grow their market share, the State will see a reduction in revenue. Incentives to encourage the adoption of electric vehicles should be accompanied by policies that ensure the State receives the revenue necessary to maintain its roadways.

Legislative Analyst: Abby Schneider

FISCAL IMPACT

The bill would not have an immediate fiscal impact on the State or local units of government. In the long run, allowing these heavier vehicles on the road would wear down roads and bridges faster and require higher funding at the State and local level to maintain road and bridge quality.

Fiscal Analyst: Bobby Canell

¹⁴ For the year 2023, the inflation-adjusted tax rate on motor fuel under the MFTA is 28.6 centers-per-gallon.

¹⁵ The Michigan Transportation Fund Act, MCL 247.651-247.675 provides for the allocation of funds from the MTF.

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This analysis was prepared by nonpartisan Senate staff for use by the Senate in its deliberations and does not constitute an official statement of legislative intent.