

**Report on Bill for Vehicle Weight Limit Exceptions
2017 Senate Bill 388/Assembly Bill 480
Prepared by the Wisconsin Department of Transportation**

**Weight Impact Study
(As Required by Wisconsin Statute 13.096)**

Analysis by the Legislative Reference Bureau

This bill makes various changes relating to the following:

1. Review by the Department of Safety and Professional Services of the state electrical wiring code applicable to one-family and two-family dwellings.
2. The legal description required for recording an easement for the construction, operation, or maintenance of sewer lines or facilities.
3. Expanding the use of tax incremental financing for workforce housing development and requiring a reduction in the amount of certain impact fees.
4. The effect of changes in requirements for development-related permits or authorizations on persons who apply for the permits or authorizations.
5. Exempting certain vehicles delivering propane from class B highway weight limitations and certain special or seasonal weight limitations.
6. Eliminating the forestation state property tax.
7. Reviews of and reports on bills and proposed administrative rules that affect housing.
8. General permits to place riprap on the bed of a navigable water.

PROPANE TRANSPORT

Under current law, in general, no person may operate on a highway any vehicle or combination of vehicles that exceeds certain statutory weight limits unless that person obtains a permit issued by the Department of Transportation or a local highway authority. Among the weight limitations are, generally, limitations on the gross weight imposed on the highway by the wheels of any one axle or by consecutive axles of the vehicle. In general, the maximum weight that may be imposed on the highway by one axle is 20,000 pounds and the maximum weight that may be imposed on the highway by two axles is 35,000 pounds if the axles are eight feet apart and 34,000 pounds if the axles are less than eight feet apart.

Also under current law, local highway authorities may impose special or seasonal weight limitations on highways that, because of deterioration or climatic conditions, would likely be seriously damaged or destroyed if limitations were not imposed. For vehicles carrying certain commodities or being used to perform certain services, local highway authorities may set different weight limitations or exempt the vehicles from the special or seasonal weight limitations if an exemption or limitation is in the interest of public health, safety, and welfare.

Local authorities may also designate highways under their jurisdiction as class "B" highways. With limited exceptions, the maximum gross weight and per-axle vehicle weight for vehicles on a class "B" highway is 60 percent of the weight allowed by statute if the vehicles were operating on a highway that is not designated as a class "B" highway.

This bill provides that special or seasonal weight limitations imposed by a highway authority and class "B" highway weight limitations do not apply to a motor vehicle that is being operated to deliver propane for heating purposes if the gross weight imposed on the highway by the vehicle does not exceed 30,000 pounds, for a vehicle with a single rear axle, or 40,000 pounds, for a vehicle with tandem rear axles, and, if the motor vehicle is a tank vehicle, the tank is loaded to no more than 50 percent of the capacity of the tank. The bill provides that a tank vehicle must be equipped with a gauge on the tank that shows the amount of propane in the tank as a percent of capacity of the tank and must carry documentation of the capacity of the tank either on the cargo tank or in the cab of the vehicle.

(a) Problem

According to the Wisconsin Propane Gas Association, Incorporated, Senate Bill 388 addresses a number of problems that current law presents to the propane industry. First, there is a patchwork of local special or seasonal weight limitations on roadways, permits and fees imposed upon the propane haulers, which is creating a burden to deliver products consistently. Some local permits come with onerous conditions such as select hours of delivery, which impact driver's ability to get product out to residential and retail customers. Next, weather conditions and temperatures pose a problem for propane haulers and especially impacts the northern third of the state. Extreme cold over a long duration can impact the supply and demand, and the variability impacts the propane sector. The propane industry said the more certain the industry is, the more certain the customer is.

Senate Bill 388 seeks to find a compromise by those concerned with maximum weight imposed on the highway and those customers needing to get propane delivered. Senate Bill 388 provides that special or seasonal weight limitations don't apply to a motor vehicle that is being operated to deliver propane for heating purposes if the gross weight does not exceed 30,000 pounds for a vehicle with a single rear axle or 40,000 pounds for a vehicle with tandem rear axles. If the motor vehicle is a tank vehicle, then the tank is loaded to no more than 50 percent of the capacity of the tank. In addition, Senate Bill 388 provides that a tank vehicle must be equipped with a gauge on the tank showing the amount of propane in the tank as a percent of capacity of the tank and must carry documentation of the capacity of the tank either on the cargo tank or in the vehicle's cab.

(a1) Whether the current vehicle weight limit creates a hardship, and if so, the degree of the hardship: In rural areas in Wisconsin, propane is used to heat homes and businesses. Restricting when propane haulers can deliver propane to rural customers increases the cost of owning and maintaining a home in rural parts of the state. (Sen. Tom Tiffany and Rep. Adam Jarchow's co-sponsorship memo). There is a lack of uniformity regarding fees and restrictions towards propane hauling across municipalities. This causes uncertainty of delivery to Wisconsin residents. The propane industry faces excessive amounts of uncertainty having to react to weather variables. The current weight limits add stress to propane distributors. More certainty within Wisconsin regulations will trickle down to more certainty for propane consumers throughout our state.

(a2) The costs associated with complying with the current vehicle weight limit and any anticipated savings likely to result from the proposed vehicle weight limit exception: The specific costs associated with complying with the current vehicle weight limit and anticipated savings likely to result from the proposed vehicle weight exception for the state are not known by the department. However, local government representatives believe residents in northern/rural Wisconsin could see a passive energy savings with less restrictions on propane supply. While propane distributors state they will save costs on compliance from less man hours dedicated to administrative tasks. In addition, the propane industry anticipates a cost savings as a result of not having to pay multiple fees for numerous municipal permits.

(a3) Whether any other efforts have been made to resolve the problem addressed by the proposed vehicle weight limit exception: The exceptions now in place for propane products are evidence that efforts have been made to address the problem of moving propane products in Wisconsin. 2013 Wisconsin Act 217 allows DOT, during an energy emergency, to authorize vehicles with a gross weight of 26,000 pounds or less which are transporting propane for delivery to Wisconsin users, to exceed posted special weight limits. 2017 Senate Bill 388 expands the weight limit exemption for propane delivery in qualified vehicles.

(a4) The degree of control by motor carriers over the weight and weight distribution of the vehicle or load: The weight limit exemption in the legislation applies only, "...if the motor vehicle is a tank vehicle, the tank is loaded to no more than 50 percent of the capacity of the tank" and is "equipped with a gauge on the tank that shows the amount of propane in the tank as a percent of capacity of the tank and must carry documentation of the capacity of the tank either on the cargo tank or in the cab of the vehicle." The weight distribution and gross weight

that is necessary for the exemption in this bill is well within the control of the operator of the vehicle.

(b) A description of the proposed vehicle weight limit exception: This bill provides that special or seasonal weight limitations imposed by a highway authority and class “B” highway weight limitations do not apply to a motor vehicle that is being operated to deliver propane for heating purposes if the gross weight imposed on the highway by the vehicle does not exceed 30,000 pounds, for a vehicle with a single rear axle, or 40,000 pounds, for a vehicle with tandem rear axle. If the motor vehicle is a tank vehicle, the tank is loaded to no more than 50 percent of the capacity of the tank. The bill provides that a tank vehicle must be equipped with a gauge on the tank that shows the amount of propane in the tank as a percent of capacity of the tank and must carry documentation of the capacity of the tank either on the cargo tank or in the cab of the vehicle.

(b1) Gross weight limitation and gross axle and axle combination weight limitations: See table in Pavement Study findings below.

(b2) Width, height and length limitations: A Class B highway would traditionally set a weight limit at 12,000 pounds versus the 20,000-pound legal weight of a single axle. The tandem rear axles would be limited to 20,400 versus 34,000 pounds. This bill would exempt them if the capacity of the tank is 50 percent or less and the overall gross weight is not exceeded.

(b3) The transportation of particular commodities: This bill applies only to the transport of propane, for heating purposes. Being able to deliver propane for heating purposes with the expanded exception proposed in this legislation will benefit Wisconsin residents who rely on propane for home and business heating when adverse weather impacts the state (e.g. polar vortex and spring thaw).

(b4) Any highway, highway route or area of the state substantially affected by the proposed vehicle weight limit exception. (b5) Seasonal transportation patterns. (c) Any other special considerations concerning the proposed vehicle weight limit exception, such as the frequency of use of the proposed exception, the support and involvement of businesses, industries and local authorities affected by the proposed exception: The Wisconsin Department of Transportation does not issue a permit to allow delivery of propane in overweight vehicles, so the department does not track routes or frequency of these types of vehicles. Industry asserted that this exception will be utilized primarily within the counties north of Highway 29 in Wisconsin. The department assumes the use of propane for home and business heating is more common in rural areas not served by natural gas distribution lines therefore rural areas would benefit more from larger delivery vehicles. Representatives from local units of government, as well as the propane industry, were not able to specifically forecast if the bill would influence seasonal transportation patterns. However, the bill may create an incentive to transport more loads during the frozen road declaration and spring thaw timeframe, when the exemption from those weight limits would be in effect.

Findings regarding 2017 Senate Bill 388 and Assembly Bill 480

Pavement Study

Introduction:

Considerations:

- 1) authority to impose special or seasonal weight limitations
- 2) weight limitation on class “B” highways

Seasonal restrictions on state highways are done during the spring thaw on some Class II roads. “Class II roads” include only state highways that are judged to have unstable condition of the

roadway subgrade during the period when frost is leaving the ground such that the travel of vehicles with overweight permits could cause undue damage to the roadway. This is to limit the potential damage done by axle loads. The thawing or melting of the ice in the subgrade weakens the pavement structure until the water has infiltrated out of the base. The normal structural capacity of the pavement is reduced during this time on these vulnerable Class II roads.

Class II roads currently account for 12 percent of the state highways with approximately 1,400 miles (94 segments) of bituminous highways. During the springtime freezing and thawing period, there are approximately 170 miles (13 segments) of Class II roads posted which account for less than 2 percent of all state highways. Class II roads with posted restrictions are limited to 6 tons of gross load for single axle vehicles and 10 tons of gross load for tandem axels (any two axels less than eight feet apart), with a maximum of 24 tons. There was not sufficient information to identify what highways, highway routes, or areas of the state would be substantially affected by the proposed propane exception due to the lack of information on sources and customers. However, the propane industry indicated that roadways north of Highway 29 would most likely utilize the proposed exception found under the bill. Regional highway operations offices may exempt certain vehicles in certain circumstances. One such example is heating fuel.

Class B highways are county trunk, town highways, city and village streets. These highways are roads under local jurisdiction that have a reduced structural capacity. The local authority has the ability to place a restriction on these roadways to maintain the current serviceability of the asset. If standard axle loading were to be allowed on the roadway it would deteriorate at a much higher rate than normally seen.

Current statutes generally prohibit the operation on a class "B" highway of any vehicle that imposes more than 60 percent of the weights authorized in S.S. 348.15 (3). That would mean, in this case, that a 30,000-lb vehicle is limited to, essentially, 18,000 lbs. A 40,000-lb vehicle is limited to 24,000 lbs.

Equivalent Single Axle Load (ESAL), is a concept developed from data collected at the American Association of State Highway Officials (AASHO) Road Test to establish a damage relationship for comparing the effects of axles carrying different loads, where 1 ESAL represents the load wear imposed by one 18,000-pound axle and with different factors used for flexible and rigid surfaces.

Propane Trucks assumed loading configuration			
No seasonal restriction			
30,000-lb vehicle	axle 1 - single	axle 2 - single	Total
lbs. per axle	10,000	20,000	30,000 lb.
ESALs per axle	0.12	1.49	1.61
40,000-lb vehicle			
lbs. per axle	axle 1 - single	axle 2 - tandem	Total
ESALs per axle	10,000	30,000	40,000 lb.
ESALs per axle	0.12	0.7	0.82
With seasonal restriction of 60 percent			
30,000-lb vehicle	axle 1 - single	axle 2 - single	Total
lbs. per axle	8,000	10,000	18,000 lb.
ESALs per axle	0.05	0.12	0.17
40,000-lb vehicle			
lbs. per axle	axle 1 - single	axle 2 - tandem	Total
ESALs per axle	10,000	14,000	24,000 lb.
ESALs per axle	0.12	0.04	0.16

Table 1: Loading and Resultant ESALs of Propane Trucks

The loadings in Table 1 show that the seasonal restriction has an 89 percent and 80 percent reduction in ESALs respectively in the 30k and 40k loadings. The reduced seasonal loading reduces the truck's impact to the pavement. Equivalent Single Axel Loads (ESALs) are a measure of impact that is based on tires, axels, configuration and the load on those elements. The reduction of weight to 60% of the normally allowed loading has an effect of reducing the ESALs that the truck imparts to the pavement structure. Pavement is designed to carry a finite number of ESALs in its life.

Evaluation:

The Wisconsin Department of Transportation, Division of Transportation System Development (DTSD) has conducted Falling Weight Deflectometer testing (FWD) on pavement sections both during and after spring thaw conditions. This data has demonstrated weaker subgrade strength values during the spring thaw. This reduced subgrade strength during the spring thaw results in more pavement distress per axle, due to the reduced load carrying capacity.

DOT's weight impact study for 2009 Senate Bill 562 (2009 Assembly Bill 778, Wisconsin Act 222) suggests the, "... greatest period of damage to pavements is precisely during the vulnerable spring thaw period where additional weight will reduce pavement longevity" to the point that damage done during spring thaw is five times that of damage that occurs during the rest of the year when subgrades and pavement structures are more stable.

The Federal Highway Administration's (FHWA) study found significant benefit in increased pavement life by imposing spring load restrictions on vulnerable roadways.

Studies by both the University of Wisconsin – Madison (1998) and University of Wisconsin – Platteville (2014) had highlighted the potential damage during spring thaw to vulnerable pavement systems.

The Wisconsin Highway Counties association (WCHA) has demonstrated the deterioration of roadways based on structure and loading in a response to the 2005 Assembly Bill 678.

Conclusion:

The department's primary focus in evaluating this bill is to ensure the adequacy of the investments made in the state's transportation system short and long term. At the same time we recognize that the intent of the bill is to ensure residents and businesses are able to obtain propane on a regular, predictable, and cost effective manner

The legislation is focused on relief for "special or seasonal weight limitations." As a general point, these limitations do not impact bridge capacity. Any load posting in place for a bridge remains constant whether or not seasonal restrictions are in place. The vehicles covered by this bill (30,000 lbs. on two axles or 40,000 lbs. on three axles) are legal configurations per State Statutes and the Federal Bridge Formula (FBF). They would be fine to travel over any bridge unless there is a load posting in place lower than the gross weight of the vehicle. In short, this legislation would have very little or no impact on the Wisconsin bridge inventory. No action would be required by WisDOT with regards to bridges in reaction to the passage of the legislation.

We would like to ensure that should the bill be approved that load posted propane trucks not be given a waiver over load posted structures (bridges and culverts). Where structures exist and vehicles exceed the posted limit, and alternate routes do not exist (example; a truck needs to cross a load posted structure to a home or business that is at the end of a cul de sac or dead end) permits and permit conditions shall be sought out to ensure delivery of propane and to protect the infrastructure.

We do expect that road conditions could worsen at an accelerated rate near propane distribution facilities.

References:

TRANSPORTATION RESEARCH RECORD 1615 Bosscher, P. J., D. Jong, and C. Benson. Field Assessment of Changes in Pavement Moduli Caused by Freezing and Thawing. (University of Wisconsin – Madison), 1998 <http://trrjournalonline.trb.org/doi/abs/10.3141/1615-06>

Owusu-Ababio, S., R. Schmitt. Evaluation of Impacts of Allowing Heavier Log Loads in Northern Wisconsin During Spring Thaw (University of Wisconsin – Platteville), March 2014 <http://wisconsin.dot.gov/documents2/research/WisDOT-Policy-Research-0092-11-16-final-report.pdf>

Wisconsin DOT., Report on Bill Establishing Vehicle Weight Limit Exceptions, appendix for Assembly Bill LRB- 05-3502/1, Weight Impact Study

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